



# Extensible Stylesheet Language (XSL)

## Version 1.1

### W3C Recommendation 05 December 2006

This version:

<http://www.w3.org/TR/2006/REC-xsl11-20061205/>

Latest version:

<http://www.w3.org/TR/xsl11/>

Previous version:

<http://www.w3.org/TR/2006/PR-xsl11-20061006/>

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Please refer to the [errata](#) for this document, which may include normative corrections.

See also [translations](#).

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## Abstract

This specification defines the features and syntax for the Extensible Stylesheet Language (XSL), a language for expressing stylesheets. It consists of two parts:

1. a language for transforming XML documents (XSLT), and
2. an XML vocabulary for specifying formatting semantics.

An XSL stylesheet specifies the presentation of a class of XML documents by describing how an instance of the class is transformed into an XML document that uses the formatting vocabulary.

## Status of this document

*This section describes the status of this document at the time of its publication. Other documents may supersede this document. A list of current W3C publications and the latest revision of this technical report can be found in the [W3C technical reports index](http://www.w3.org/TR/) at <http://www.w3.org/TR/>.*

Please see the Working Group's [implementation report](#).

This Recommendation supersedes [XSL 1.0], which was published 15 October 2001. New functionality has been added to support change marks, indexes, multiple flows, and bookmarks. Existing functionality has been extended in the areas of graphics scaling, "markers" and their retrieval in tables to support e.g. partial sums, and page number referencing. The changes made in this document are intended to meet the requirements for XSL 1.1 described in [XSL 1.1 Requirements]. A number of errata have been incorporated into the text. See [Appendix E – Changes from XSL 1.0](#) on page 494.

This document has been produced as part of the [W3C XML Activity](#) by the [XSL Working Group](#).

Please send comments about this document to [xsl-editors@w3.org](mailto:xsl-editors@w3.org) (with [public archive](#)).

General public discussion of XSL takes place on the [XSL-List](#) and on the [www-xsl-fo](#) mailing lists.

This document has been reviewed by W3C Members, by software developers, and by other W3C groups and interested parties, and is endorsed by the Director as a W3C Recommendation. It is a stable document and may be used as reference material or cited from another document. W3C's role in making the Recommendation is to draw attention to the specification and to promote its widespread deployment. This enhances the functionality and interoperability of the Web.

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# 1. Introduction and Overview

This specification defines the Extensible Stylesheet Language (XSL). XSL is a language for expressing stylesheets. Given a class of arbitrarily structured XML [XML] or [XML 1.1] documents or data files, designers use an XSL stylesheet to express their intentions about how that structured content should be presented; that is, how the source content should be styled, laid out, and paginated onto some presentation medium, such as a window in a Web browser or a hand-held device, or a set of physical pages in a catalog, report, pamphlet, or book.

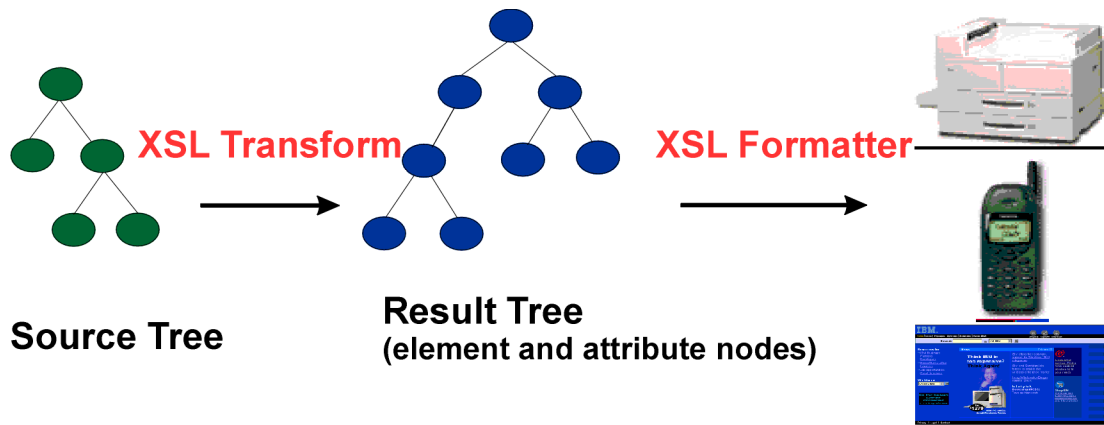
## 1.1. Processing a Stylesheet

An XSL *stylesheet processor* accepts a document or data in XML and an XSL stylesheet and produces the presentation of that XML source content that was intended by the designer of that stylesheet. There are two aspects of this presentation process: first, constructing a result tree from the XML source tree and second, interpreting the result tree to produce formatted results suitable for presentation on a display, on paper, in speech, or onto other media. The first aspect is called *tree transformation* and the second is called *formatting*. The process of formatting is performed by the *formatter*. This formatter may simply be a rendering engine inside a browser.

Tree transformation allows the structure of the result tree to be significantly different from the structure of the source tree. For example, one could add a table-of-contents as a filtered selection of an original source document, or one could rearrange source data into a sorted tabular presentation. In constructing the result tree, the tree transformation process also adds the information necessary to format that result tree.

Formatting is enabled by including formatting semantics in the result tree. Formatting semantics are expressed in terms of a catalog of classes of *formatting objects*. The nodes of the result tree are formatting objects. The classes of formatting objects denote typographic abstractions such as page, paragraph, table, and so forth. Finer control over the presentation of these abstractions is provided by a set of *formatting properties*, such as those controlling indents, word- and letter spacing, and widow, orphan, and hyphenation control. In XSL, the classes of formatting objects and formatting properties provide the vocabulary for expressing presentation intent.

The XSL processing model is intended to be conceptual only. An implementation is not mandated to provide these as separate processes. Furthermore, implementations are free to process the source document in any way that produces the same result as if it were processed using the conceptual XSL processing model. A diagram depicting the detailed conceptual model is shown below.



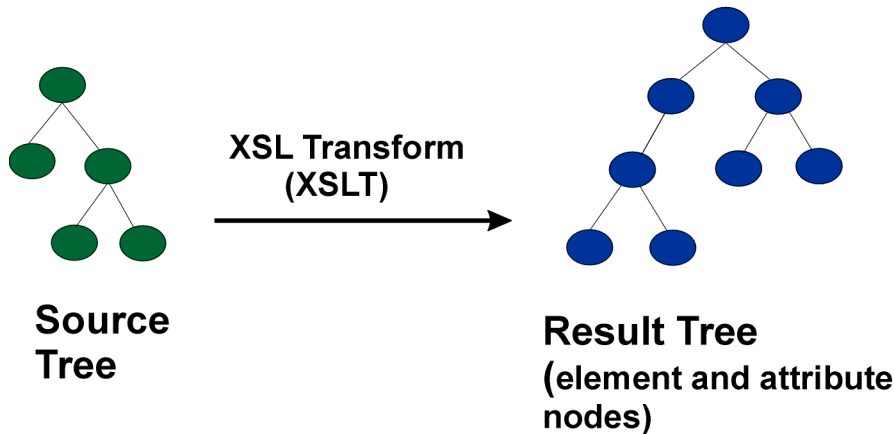
**Result XML tree is the result of XSLT processing.**

**XSL Two Processes: Transformation & Formatting**

### 1.1.1. Tree Transformations

Tree transformation constructs the result tree. In XSL, this tree is called the *element and attribute tree*, with objects primarily in the "formatting object" namespace. In this tree, a formatting object is represented as an XML element, with the properties represented by a set of XML attribute-value pairs. The content of the formatting object is the content of the XML element. Tree transformation is defined in the XSLT Recommendation [XSLT]. A diagram depicting this conceptual process is shown below.

**With tree transformation, the structure of the result tree can be quite different from the structure of the source tree**



**In constructing the result tree, the source tree can be filtered and reordered, and arbitrary structure and generated content can be added.**

#### **Transform to Another Vocabulary**

The XSL stylesheet is used in tree transformation. A stylesheet contains a set of tree construction rules. The tree construction rules have two parts: a pattern that is matched against elements in the source tree and a template that constructs a portion of the result tree. This allows a stylesheet to be applicable to a wide class of documents that have similar source tree structures.

In some implementations of XSL/XSLT, the result of tree construction can be output as an XML document. This would allow an XML document which contains formatting objects and formatting properties to be output. This capability is neither necessary for an XSL processor nor is it encouraged. There are, however, cases where this is important, such as a server preparing input for a known client; for example, the way that a WAP (<http://www.wapforum.org/faqs/index.htm>) server prepares specialized input for a WAP capable hand held device. To preserve accessibility, designers of Web systems should not develop architectures that require (or use) the transmission of documents containing formatting objects and properties unless either the transmitter knows that the client can accept formatting objects and properties or the transmitted document contains a reference to the source document(s) used in the construction of the document with the formatting objects and properties.

### **1.1.2. Formatting**

Formatting interprets the result tree in its formatting object tree form to produce the presentation intended by the designer of the stylesheet from which the XML element and attribute tree in the "fo" namespace was constructed.

The vocabulary of formatting objects supported by XSL - the set of  $f_o$ : element types - represents the set of typographic abstractions available to the designer. Semantically, each formatting object represents a specification for a part of the pagination, layout, and styling information that will be applied to the content of that formatting object as a result of formatting the whole result tree. Each formatting object class represents a particular kind of formatting behavior. For example, the block formatting object class represents the breaking of the content of a paragraph into lines. Other parts of the specification may come from other formatting objects; for example, the formatting of a paragraph (block formatting object) depends on both the specification of properties on the block formatting object and the specification of the layout structure into which the block is placed by the formatter.

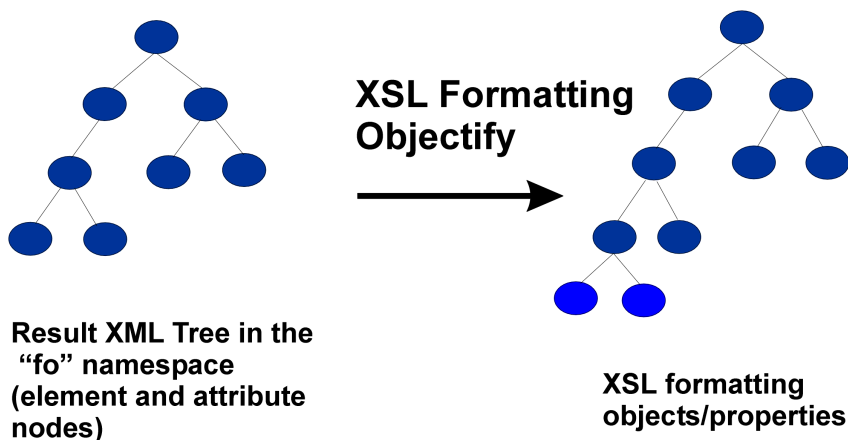
The properties associated with an instance of a formatting object control the formatting of that object. Some of the properties, for example "color", directly specify the formatted result. Other properties, for example 'space-before', only constrain the set of possible formatted results without specifying any particular formatted result. The formatter may make choices among other possible considerations such as esthetics.

Formatting consists of the generation of a tree of geometric areas, called the *area tree*. The geometric areas are positioned on a sequence of one or more pages (a browser typically uses a single page). Each geometric area has a position on the page, a specification of what to display in that area and may have a background, padding, and borders. For example, formatting a single character generates an area sufficiently large enough to hold the glyph that is used to present the character visually and the glyph is what is displayed in this area. These areas may be nested. For example, the glyph may be positioned within a line, within a block, within a page.

Rendering takes the area tree, the abstract model of the presentation (in terms of pages and their collections of areas), and causes a presentation to appear on the relevant medium, such as a browser window on a computer display screen or sheets of paper. The semantics of rendering are not described in detail in this specification.

The first step in formatting is to "objectify" the element and attribute tree obtained via an XSLT transformation. Objectifying the tree basically consists of turning the elements in the tree into formatting object nodes and the attributes into property specifications. The result of this step is the *formatting object tree*.

The XSL FO tree is processed: characters are converted to character FOs and compound properties are built.



Some of the properties, for example "color", directly specify the formatted result.

Other properties, for example 'space-before', only constrain the set of possible formatted results without specifying any particular formatted result.

### Build the XSL Formatting Object Tree

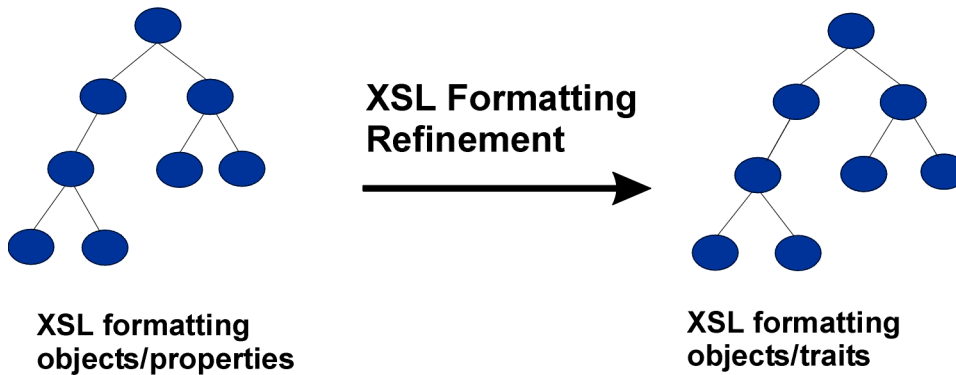
As part of the step of objectifying, the characters that occur in the result tree are replaced by fo:character nodes. Characters in text nodes which consist solely of white space characters and which are children of elements whose corresponding formatting objects do not permit fo:character nodes as children are ignored. Other characters within elements whose corresponding formatting objects do not permit fo:character nodes as children are errors.

The content of the fo:instream-foreign-object is not objectified; instead the object representing the fo:instream-foreign-object element points to the appropriate node in the element and attribute tree. Similarly any non-XSL namespace child element of fo:declarations is not objectified; instead the object representing the fo:declarations element points to the appropriate node in the element and attribute tree.

The second phase in formatting is to refine the formatting object tree to produce the *refined formatting object tree*. The refinement process handles the mapping from properties to traits. This consists of: (1) shorthand expansion into individual properties, (2) mapping of corresponding properties, (3) determining computed values (may include expression evaluation), (4) handling white-space-treatment and linefeed-treatment property effects, and (5) inheritance. Details on refinement are found in [§ 5 – Property Refinement / Resolution](#) on page 44.

The refinement step is depicted in the diagram below.

**The XSL formatting object tree is refined in an iterative fashion.**



**Property inheritance is resolved, computed values are processed, expressions are evaluated, and duplicate corresponding properties are removed.**

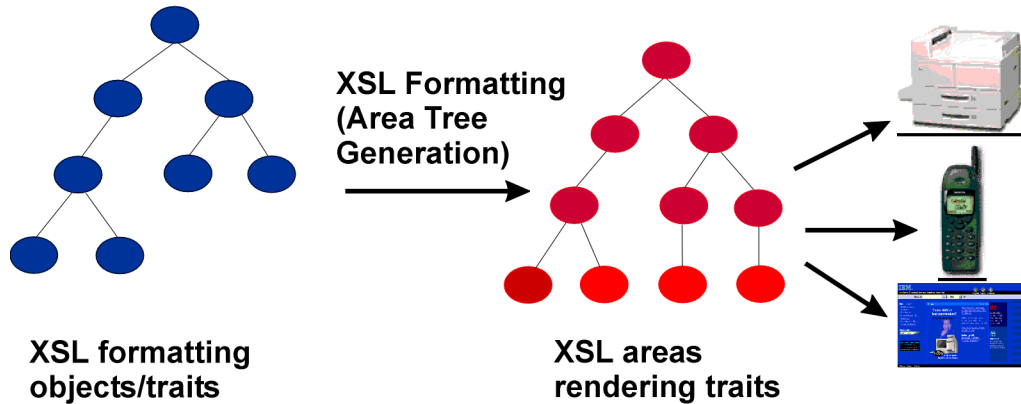
#### Refine the Formatting Object Tree

The third step in formatting is the construction of the area tree. The area tree is generated as described in the semantics of each formatting object. The traits applicable to each formatting object class control how the areas are generated. Although every formatting property may be specified on every formatting object, for each formatting object class, only a subset of the formatting properties are used to determine the traits for objects of that class.

Area generation is depicted in the diagram below.

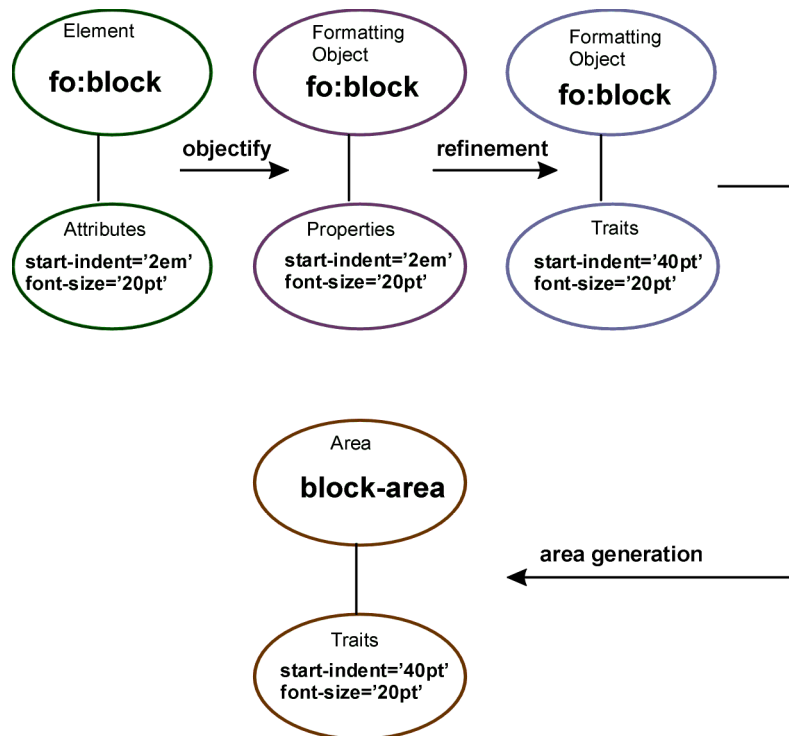


The last part of formatting describes the generation of a tree of geometric areas. These areas are positioned on a sequence of one or more pages.



Each geometric area has a position on the page, a specification of what to display in that area and may have a background, padding, and borders.

Generate the Area Tree



Summary of the Process

## 1.2. Benefits of XSL

Unlike the case of HTML, element names in XML have no intrinsic presentation semantics. Absent a stylesheet, a processor could not possibly know how to render the content of an XML document other than as an undifferentiated string of characters. XSL provides a comprehensive model and a vocabulary for writing such stylesheets using XML syntax.

This document is intended for implementors of such XSL processors. Although it can be used as a reference manual for writers of XSL stylesheets, it is not tutorial in nature.

XSL builds on the prior work on Cascading Style Sheets [CSS2] and the Document Style Semantics and Specification Language [DSSSL]. While many of XSL's formatting objects and properties correspond to the common set of properties, this would not be sufficient by itself to accomplish all the goals of XSL. In particular, XSL introduces a model for pagination and layout that extends what is currently available and that can in turn be extended, in a straightforward way, to page structures beyond the simple page models described in this specification.

### 1.2.1. Paging and Scrolling

Doing both scrollable document windows and pagination introduces new complexities to the styling (and pagination) of XML content. Because pagination introduces arbitrary boundaries (pages or regions on pages) on the content, concepts such as the control of spacing at page, region, and block boundaries become extremely important. There are also concepts related to adjusting the spaces between lines (to adjust the page vertically) and between words and letters (to justify the lines of text). These do not always arise with simple scrollable document windows, such as those found in today's browsers. However, there is a correspondence between a page with multiple regions, such as a body, header, footer, and

left and right sidebars, and a Web presentation using "frames". The distribution of content into the regions is basically the same in both cases, and XSL handles both cases in an analogous fashion.

XSL was developed to give designers control over the features needed when documents are paginated as well as to provide an equivalent "frame" based structure for browsing on the Web. To achieve this control, XSL has extended the set of formatting objects and formatting properties beyond those available in either CSS2 or DSSSL. In addition, the selection of XML source components that can be styled (elements, attributes, text nodes, comments, and processing instructions) is based on XSLT and XPath [XPath], thus providing the user with an extremely powerful selection mechanism.

The design of the formatting objects and properties extensions was first inspired by DSSSL. The actual extensions, however, do not always look like the DSSSL constructs on which they were based. To either conform more closely with the CSS2 specification or to handle cases more simply than in DSSSL, some extensions have diverged from DSSSL.

There are several ways in which extensions were made. In some cases, it sufficed to add new values, as in the case of those added to reflect a variety of writing-modes, such as top-to-bottom and bottom-to-top, rather than just left-to-right and right-to-left.

In other cases, common properties that are expressed in CSS2 as one property with multiple simultaneous values, were split into several new properties to provide independent control over independent aspects of the property. For example, the "white-space" property was split into four properties: a "white-space-treatment" property that controls how white space is processed, a "linefeed-treatment" property that controls how line feeds are processed, a "white-space-collapse" property that controls how multiple consecutive spaces are collapsed, and a "wrap-option" property that controls whether lines are automatically wrapped when they encounter a boundary, such as the edge of a column. The effect of splitting a property into two or more (sub-)properties is to make the equivalent existing CSS2 property a "shorthand" for the set of sub-properties it subsumes.

In still other cases, it was necessary to create new properties. For example, there are a number of new properties that control how hyphenation is done. These include identifying the script and country the text is from as well as such properties as "hyphenation-character" (which varies from script to script).

Some of the formatting objects and many of the properties in XSL come from the CSS2 specification, ensuring compatibility between the two.

There are four classes of XSL properties that can be identified as:

1. CSS properties by copy (unchanged from their CSS2 semantics)
2. CSS properties with extended values
3. CSS properties broken apart and/or extended
4. XSL-only properties

### 1.2.2. Selectors and Tree Construction

As mentioned above, XSL uses XSLT and XPath for tree construction and pattern selection, thus providing a high degree of control over how portions of the source content are presented, and what properties are associated with those content portions, even where mixed namespaces are involved.

For example, the patterns of XPath allow the selection of a portion of a string or the Nth text node in a paragraph. This allows users to have a rule that makes all third paragraphs in procedural steps appear in bold, for instance. In addition, properties can be associated with a content portion based on the numeric

value of that content portion or attributes on the containing element. This allows one to have a style rule that makes negative values appear in "red" and positive values appear in "black". Also, text can be generated depending on a particular context in the source tree, or portions of the source tree may be presented multiple times with different styles.

### 1.2.3. An Extended Page Layout Model

There is a set of formatting objects in XSL to describe both the layout structure of a page or "frame" (how big is the body; are there multiple columns; are there headers, footers, or sidebars; how big are these) and the rules by which the XML source content is placed into these "containers".

The layout structure is defined in terms of one or more instances of a "simple-page-master" formatting object. This formatting object allows one to define independently filled regions for the body (with multiple columns), a header, a footer, and sidebars on a page. These simple-page-masters can be used in page sequences that specify in which order the various simple-page-masters shall be used. The page sequence also specifies how styled content is to fill those pages. This model allows one to specify a sequence of simple-page-masters for a book chapter where the page instances are automatically generated by the formatter or an explicit sequence of pages such as used in a magazine layout. Styled content is assigned to the various regions on a page by associating the name of the region with names attached to styled content in the result tree.

In addition to these layout formatting objects and properties, there are properties designed to provide the level of control over formatting that is typical of paginated documents. This includes control over hyphenation, and expanding the control over text that is kept with other text in the same line, column, or on the same page.

### 1.2.4. A Comprehensive Area Model

The extension of the properties and formatting objects, particularly in the area on control over the spacing of blocks, lines, and page regions and within lines, necessitated an extension of the CSS2 box formatting model. This extended model is described in § 4 – [Area Model](#) on page 15 of this specification. The CSS2 box model is a subset of this model. See the mapping of the CSS2 box model terminology to the XSL Area Model terminology in § 7.2 – [XSL Areas and the CSS Box Model](#) on page 235. The area model provides a vocabulary for describing the relationships and space-adjustment between letters, words, lines, and blocks.

### 1.2.5. Internationalization and Writing-Modes

There are some scripts, in particular in the Far East, that are typically set with words proceeding from top-to-bottom and lines proceeding either from right-to-left (most common) or from left-to-right. Other directions are also used. Properties expressed in terms of a fixed, absolute frame of reference (using top, bottom, left, and right) and which apply only to a notion of words proceeding from left to right or right to left do not generalize well to text written in those scripts.

For this reason XSL (and before it DSSSL) uses a relative frame of reference for the formatting object and property descriptions. Just as the CSS2 frame of reference has four directions (top, bottom, left and right), so does the XSL relative frame of reference have four directions (before, after, start, and end), but these are relative to the "writing-mode". The "writing-mode" property is a way of controlling the directions needed by a formatter to correctly place glyphs, words, lines, blocks, etc. on the page or screen. The "writing-mode" expresses the basic directions noted above. There are writing-modes for "left-to-right - top-to-bottom" (denoted as "lr-tb"), "right-to-left - top-to-bottom" (denoted as "rl-tb"), "top-to-bottom - right-to-left" (denoted as "tb-rl") and more. See § 7.29.7 – [“writing-mode”](#) on page 401 for the description

of the "writing-mode" property. Typically, the writing-mode value specifies two directions: the first is the inline-progression-direction which determines the direction in which words will be placed and the second is the block-progression-direction which determines the direction in which blocks (and lines) are placed one after another. In addition, the inline-progression-direction for a sequence of characters may be implicitly determined using bidirectional character types for those characters from the Unicode Character Database [[UNICODE Character Database](#)] for those characters and the Unicode bidirectional (BIDI) algorithm [[UNICODE UAX #9](#)].

Besides the directions that are explicit in the name of the value of the "writing-mode" property, the writing-mode determines other directions needed by the formatter, such as the shift-direction (used for subscripts and superscripts), etc.

### 1.2.6. Linking

Because XML, unlike HTML, has no built-in semantics, there is no built-in notion of a hypertext link. In this context, "link" refers to "hypertext link" as defined in <http://www.w3.org/TR/html401/struct/links.html#h-12.1> as well as some of the aspects of "link" as defined in <http://www.w3.org/TR/xlink/#intro>, where "link is a relationship between two or more resources or portions of resources, made explicit by an XLink linking element". Therefore, XSL has a formatting object that expresses the dual semantics of formatting the content of the link reference and the semantics of following the link.

XSL provides a few mechanisms for changing the presentation of a link target that is being visited. One of these mechanisms permits indicating the link target as such; another allows for control over the placement of the link target in the viewing area; still another permits some degree of control over the way the link target is displayed in relationship to the originating link anchor.

XSL also provides a general mechanism for changing the way elements are formatted depending on their active state. This is particularly useful in relation to links, to indicate whether a given link reference has already been visited, or to apply a given style depending on whether the mouse, for instance, is hovering over the link reference or not.

## 2. XSL Transformation


### 2.1. Tree Construction

The Tree Construction is described in "XSL Transformations" [[XSLT](#)]. The data model in XSLT is capable of representing either an XML 1.0 document (conforming to [[XML](#)] and [[XML Names](#)]) or an XML 1.1 document (conforming to [[XML 1.1](#)] and [[XML Names 1.1](#)]), and it makes no distinction between the two. In principle, therefore, XSL 1.1 can be used with either of these XML versions; the only differences arise outside the boundary of the transformation proper, while creating the data model from textual XML (parsing).

The provisions in "XSL Transformations" form an integral part of this Recommendation and are considered normative. Because the data model is the same whether the original document was XML 1.0 or XML 1.1, the semantics of XSLT processing do not depend on the version of XML used by the original document. There is no reason in principle why all the documents used in a single transformation must conform to the same version of XML.

## 2.2. XSL Namespace

The XSL namespace has the URI `http://www.w3.org/1999/XSL/Format`.


 The 1999 in the URI indicates the year in which the URI was allocated by the W3C. It does not indicate the version of XSL being used.

XSL processors must use the XML namespaces mechanism ([XML Names] or [XML Names 1.1]) to recognize elements and attributes from this namespace. Elements from the XSL namespace are recognized only in the stylesheet, not in the source document. Implementors must not extend the XSL namespace with additional elements or attributes. Instead, any extension must be in a separate namespace. The expanded-name of extension elements must have a non-null namespace URI.

This specification uses the prefix `fo:` for referring to elements in the XSL namespace. However, XSL stylesheets are free to use any prefix, provided that there is a namespace declaration that binds the prefix to the URI of the XSL namespace.

An element from the XSL namespace may have any attribute not from the XSL namespace, provided that the expanded-name of the attribute has a non-null namespace URI. The presence of such attributes must not change the behavior of XSL elements and functions defined in this document. This means that an extension attribute may change the processing of an FO, but only provided that the constraints specified by XSL on that FO remain satisfied. Thus, an XSL processor is always free to ignore such attributes, and must ignore such attributes without giving an error if it does not recognize the namespace URI. Such attributes can provide, for example, unique identifiers, optimization hints, or documentation.

It is an error for an element from the XSL namespace to have attributes with expanded-names that have null namespace URIs (i.e., attributes with unprefixed names) other than attributes defined in this document.

 The conventions used for the names of XSL elements, attributes, and functions are as follows: names are all lowercase, hyphens are used to separate words, dots are used to separate names for the components of complex datatypes, and abbreviations are used only if they already appear in the syntax of a related language such as XML or HTML.

## 3. Introduction to Formatting

The aim of this section is to describe the general process of formatting, enough to read the area model and the formatting object descriptions and properties and to understand the process of refinement.

*Formatting* is the process of turning the result of an XSL transformation into a tangible form for the reader or listener. This process comprises several steps, some of which depend on others in a non-sequential way. Our model for formatting will be the construction of an *area tree*, which is an ordered tree containing geometric information for the placement of every glyph, shape, and image in the document, together with information embodying spacing constraints and other rendering information; this information is referred to under the rubric of *traits*, which are to areas what properties are to formatting objects and attributes are to XML elements. § 4 – Area Model on page 15 will describe the area tree and define the default placement constraints on stacked areas. However, this is an abstract model which need not be actually implemented in this way in a formatter, so long as the resulting tangible form obeys the implied constraints. Constraints might conflict to the point where it is impossible to satisfy them all. In

that case, it is implementation-defined which constraints should be relaxed and in what order to satisfy the others.

*Formatting objects* are elements in the formatting object tree, whose names are from the XSL namespace; a formatting object belongs to a *class* of formatting objects identified by its element name. The formatting behavior of each class of formatting objects is described in terms of what areas are created by a formatting object of that class, how the traits of the areas are established, and how the areas are structured hierarchically with respect to areas created by other formatting objects. [§ 6 – Formatting Objects](#) on page 73 and [§ 7 – Formatting Properties](#) on page 232 describe formatting objects and their properties.

Some formatting objects are *block-level* and others are *inline-level*. This refers to the types of areas which they generate, which in turn refer to their default placement method. Inline-areas (for example, glyph-areas) are collected into lines and the direction in which they are stacked is the inline-progression-direction. Lines are a type of block-area and these are stacked in a direction perpendicular to the inline-progression-direction, called the block-progression-direction. See [§ 4 – Area Model](#) on page 15 for detailed descriptions of these area types and directions.

In Western writing systems, the block-progression-direction is "top-to-bottom" and the inline-progression-direction is "left-to-right". This specification treats other writing systems as well and introduces the terms "block" and "inline" instead of using absolute indicators like "vertical" and "horizontal". Similarly this specification tries to give relatively-specified directions ("before" and "after" in the block-progression-direction, "start" and "end" in the inline-progression-direction) where appropriate, either in addition to or in place of absolutely-specified directions such as "top", "bottom", "left", and "right". These are interpreted according to the value of the writing-mode property.

Central to this model of formatting is *refinement*. This is a computational process which finalizes the specification of properties based on the attribute values in the XML result tree. Though the XML result tree and the formatting object tree have very similar structure, it is helpful to think of them as separate conceptual entities. Refinement involves

- propagating the various inherited values of properties (both implicitly and those with an attribute value of "inherit"),
- evaluating expressions in property value specifications into actual values, which are then used to determine the value of the properties,
- converting relative numerics to absolute numerics,
- constructing some composite properties from more than one attribute

Some of these operations (particularly evaluating expressions) depend on knowledge of the area tree. Thus refinement is not necessarily a straightforward, sequential procedure, but may involve look-ahead, back-tracking, or control-splicing with other processes in the formatter. Refinement is described more fully in [§ 5 – Property Refinement / Resolution](#) on page 44.

To summarize, formatting proceeds by constructing an area tree (containing areas and their traits) which satisfies constraints based on information contained in the XML result tree (containing element nodes and their attributes). Conceptually, there are intermediate steps of constructing a formatting object tree (containing formatting objects and their properties) and refinement; these steps may proceed in an interleaved fashion during the construction of the area tree.

### 3.1. Conceptual Procedure

This subsection contains a conceptual description of how formatting could work. This conceptual procedure does not mandate any particular algorithms or data structures as long as the result obeys the implied constraints.

The procedure works by processing formatting objects. Each object, while being processed, may initiate processing of other objects. While the objects are hierarchically structured, the processing is not; processing of a given object is rather like a co-routine which may pass control to other processes, but pick up again later where it left off. The procedure starts by initiating the processing of the fo:root formatting object.

Unless otherwise specified, processing a formatting object creates areas and returns them to its parent to be placed in the area tree. Like a co-routine, when given control, it initiates, then continues formatting of its own children (if any), or some subset of them. The formatting object supplies parameters to its children based on the traits of areas already in the area tree, possibly including areas generated by the formatting object or its ancestors. It then disposes of the areas returned by its formatting object children. It might simply return such an area to its parent (and will always do this if it does not generate areas itself), or alternatively it might arrange the area in the area tree according to the semantics of the formatting object; this may involve changing its geometric position. It terminates processing when all its children have terminated processing (if initiated) and it is finished generating areas.

Some formatting objects do not themselves generate areas; instead these formatting objects simply return the areas returned to them by their children. Alternatively, a formatting object may continue to generate (and return) areas based on information discovered while formatting its own children; for example, the fo:page-sequence formatting object will continue generating pages as long as it contains a flow with unprocessed descendants.

Areas returned to an fo:root formatting object are page-viewport-areas, and are simply placed as children of the area tree root in the order in which they are returned, with no geometrical implications.

As a general rule, the order of the area tree parallels the order of the formatting object tree. That is, if one formatting object precedes another in the depth-first traversal of the formatting object tree, with neither containing the other, then all the areas generated by the first will precede all the areas generated by the second in the depth-first traversal of the area tree, unless otherwise specified. Typical exceptions to this rule would be things like side floats, before floats, and footnotes.

At the end of the procedure, the areas and their traits have been constructed, and they are required to satisfy constraints described in the definitions of their associated formatting objects, and in the area model section. In particular, size and position of the areas will be subject to the placement and spacing constraints described in the area model, unless the formatting object definition indicates otherwise.

The formatting object definitions, property descriptions, and area model are not algorithms. Thus, the formatting object semantics do not specify how the line-breaking algorithm must work in collecting characters into words, positioning words within lines, shifting lines within a container, etc. Rather this specification assumes that the formatter has done these things and describes the constraints which the result is supposed to satisfy. Thus, the constraints do not specify at what time an implementation makes use of that information; the constraints only specify what must be true after processing has been completed. An actual implementation may well make use of some constraints at a time other than when formatting the formatting object for which the constraint applies. For example, the constraint given by the "hyphenate" property on an fo:character would typically be used during line-building, rather than when processing the fo:character. Other examples include constraints for keeps and breaks.




## 4. Area Model

In XSL, one creates a tree of formatting objects that serve as inputs or specifications to a formatter. The formatter generates a hierarchical arrangement of areas which comprise the formatted result. This section defines the general model of these areas and how they interact. The purpose is to present an abstract framework which is used in describing the semantics of formatting objects. It should be seen as describing a series of constraints for conforming implementations, and not as prescribing particular algorithms.

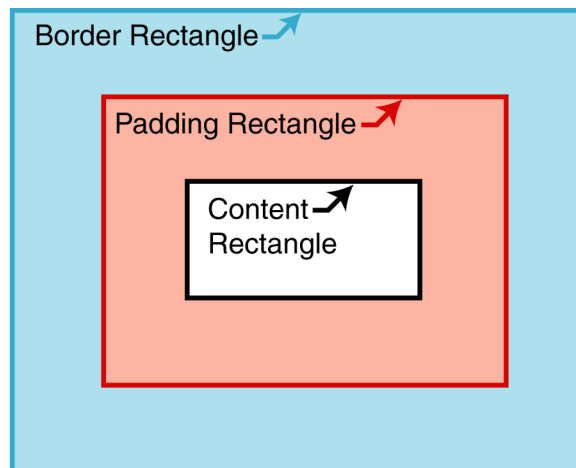
### 4.1. Introduction

The formatter generates an ordered tree, the *area tree*, which describes a geometric structuring of the output medium. The terms *child*, *sibling*, *parent*, *descendant*, and *ancestor* refer to this tree structure. The tree has a *root node*.

Each area tree node other than the root is called an *area* and is associated to a rectangular portion of the output medium. Areas are not formatting objects; rather, a formatting object generates zero or more rectangular areas, and normally each area is generated by a unique object in the formatting object tree.

 The only exceptions to this rule are when several leaf nodes of the formatting object tree are combined to generate a single area, for example when several characters in sequence generate a single ligature glyph. In all such cases, relevant properties such as *font-family* and *font-size* must be the same for all the generating formatting objects (see section § 4.7.2 – [Line-building](#) on page 38).

An area has a *content-rectangle*, the portion in which its child areas are assigned, and optional *padding* and *border*. The diagram shows how these portions are related to one another. The outer bound of the border is called the *border-rectangle*, and the outer bound of the padding is called the *padding-rectangle*.



Each area has a set of *traits*, a mapping of names to values, in the way elements have attributes and formatting objects have properties. Individual traits are used either for rendering the area or for defining constraints on the result of formatting, or both. Traits used strictly for formatting purposes or for defining constraints may be called *formatting traits*, and traits used for rendering may be called *rendering traits*. Traits whose values are copied or derived from a property of the same or a corresponding name are listed in [Appendix B – Property Summary](#) on page 441 and [§ 5 – Property Refinement / Resolution](#) on page 44; other traits are listed below.



Traits are also associated with FOs during the process of refinement. Some traits are assigned during formatting, while others are already present after refinement.

The semantics of each type of formatting object that generates areas are given in terms of which areas it generates and their place in the area-tree hierarchy. This may be further modified by interactions between the various types of formatting objects. The properties of the formatting object determine what areas are generated and how the formatting object's content is distributed among them. (For example, a word that is not to be hyphenated may not have its glyphs distributed into areas on two separate line-areas.)

The traits of an area are either:

*directly-derived*: the values of directly-derived traits are the computed value of a property of the same or a corresponding name on the generating formatting object, or

*indirectly-derived*: the values of indirectly-derived traits are the result of a computation involving the computed values of one or more properties on the generating formatting object, other traits on this area or other interacting areas (ancestors, parent, siblings, and/or children) and/or one or more values constructed by the formatter. The calculation formula may depend on the type of the formatting object.

This description assumes that refined values have been computed for all properties of formatting objects in the result tree, i.e., all relative and corresponding values have been computed and the inheritable values have been propagated as described in § 5 – Property Refinement / Resolution on page 44. This allows the process of inheritance to be described once and avoids a need to repeat information on computing values in this description.

The indirectly-derived traits are: *block-progression-direction*, *inline-progression-direction*, *shift-direction*, *glyph-orientation*, *is-reference-area*, *is-viewport-area*, *left-position*, *right-position*, *top-position*, *bottom-position*, *left-offset*, *top-offset*, *is-first*, *is-last*, *alignment-point*, *area-class*, *start-intrusion-adjustment*, *end-intrusion-adjustment*, *generated-by*, *returned-by*, *folio-number*, *blink*, *underline-score*, *overline-score*, *through-score*, *underline-score-color*, *overline-score-color*, *through-score-color*, *alignment-baseline*, *baseline-shift*, *nominal-font*, *dominant-baseline-identifier*, *actual-baseline-table*, and *script*.

## 4.2. Rectangular Areas

### 4.2.1. Area Types

There are two types of areas: *block-areas* and *inline-areas*. These differ according to how they are typically stacked by the formatter. An area can have block-area children or inline-area children as determined by the generating formatting object, but a given area's children must all be of one type. Although block-areas and inline-areas are typically stacked, some areas can be explicitly positioned.

A *line-area* is a special kind of block-area whose children are all inline-areas. A *glyph-area* is a special kind of inline-area which has no child areas, and has a single glyph image as its content.

Typical examples of areas are: a paragraph rendered by using an fo:block formatting object, which generates block-areas, and a character rendered by using an fo:character formatting object, which generates an inline-area (in fact, a glyph-area).

### 4.2.2. Common Traits

Associated with any area are two directions, which are derived from the generating formatting object's *writing-mode* and *reference-orientation* properties: the *block-progression-direction* is the direction for stacking block-area descendants of the area, and the *inline-progression-direction* is the direction for

stacking inline-area descendants of the area. Another trait, the *shift-direction*, is present on inline-areas and refers to the direction in which baseline shifts are applied. Also the *glyph-orientation* defines the orientation of glyph-images in the rendered result.

If the reference-orientation for an area is 0, then the top, bottom, left, and right edges of the content are parallel to those of the area's parent and consistent with them. Otherwise the edges are rotated from those of the area's parent as described in § 7.21.3 – “reference-orientation” on page 349. The inline-progression-direction and block-progression-direction are determined by the location of these edges as described in § 7.29.7 – “writing-mode” on page 401.

The Boolean trait *is-reference-area* determines whether or not an area establishes a coordinate system for specifying indents. An area for which this trait is **true** is called a *reference-area*. Only a reference-area may have a block-progression-direction which is different from that of its parent. A reference-area may be either a block-area or an inline-area. Only specific formatting objects generate reference areas.

The Boolean trait *is-viewport-area* determines whether or not an area establishes an opening through which its descendant areas can be viewed, and can be used to present clipped or scrolled material; for example, in printing applications where bleed and trim is desired. An area for which this trait is **true** is called a *viewport-area*. A viewport-area also has the value **true** for the *is-reference-area* trait.

A common construct is a *viewport/reference pair*. This is a viewport-area *V* and a block-area reference-area *R*, where *R* is the sole child of *V* and where the start-edge and end-edge of the content-rectangle of *R* are parallel to the start-edge and end-edge of the content-rectangle of *V*.

Each area has the traits *top-position*, *bottom-position*, *left-position*, and *right-position* which represent the distance from the edges of its content-rectangle to the like-named edges of the nearest ancestor reference-area (or the page-viewport-area in the case of areas generated by descendants of formatting objects whose absolute-position is **fixed**); the *left-offset* and *top-offset* determine the amount by which a relatively-positioned area is shifted for rendering. These traits receive their values during the formatting process, or in the case of absolutely positioned areas, during refinement.

The *block-progression-dimension* and *inline-progression-dimension* of an area represent the extent of the content-rectangle of that area in each of the two relative directions.

Other traits include:

- the *is-first* and *is-last* traits, which are Boolean traits indicating the order in which areas are generated and returned (See § 6.1.1 – Definitions Common to Many Formatting Objects on page 74) by a given formatting object. *is-first* is **true** for the first area (or only area) generated and returned by a formatting object, and *is-last* is **true** for the last area (or only area);
- the amount of space outside the border-rectangle: *space-before*, *space-after*, *space-start*, and *space-end* (though some of these may be required to be zero on certain classes of area);



"Before", "after", "start", and "end" refer to relative directions and are defined below.

- the thickness of each of the four sides of the padding: *padding-before*, *padding-after*, *padding-start*, and *padding-end*;
- the style, thickness, and color of each of the four sides of the border: *border-before*, etc.;
- the background rendering of the area: *background-color*, *background-image*, and other background traits; and

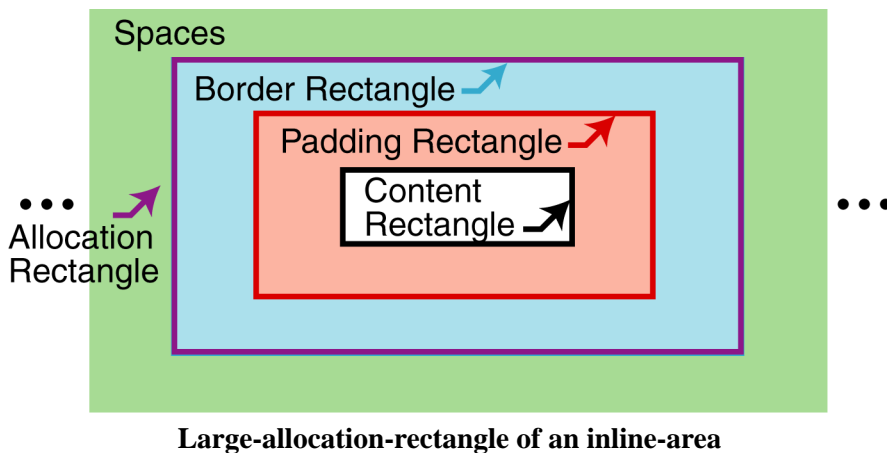
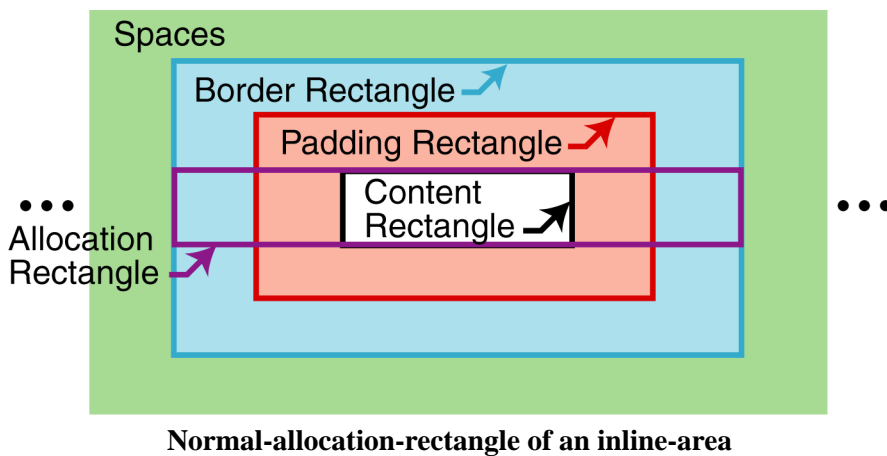
- the *nominal-font* for an area, as determined by the font properties and the character descendants of the area's generating formatting object. (see § 5.5.7 – [Font Properties](#) on page 54)

Unless otherwise specified, the traits of a formatting object are present on each of its generated areas, and with the same value. (However, see sections § 4.7.2 – [Line-building](#) on page 38 and § 4.9.4 – [Border, Padding, and Background](#) on page 42.) The *id* trait is computed for formatting objects but is not present on areas.


### 4.2.3. Geometric Definitions

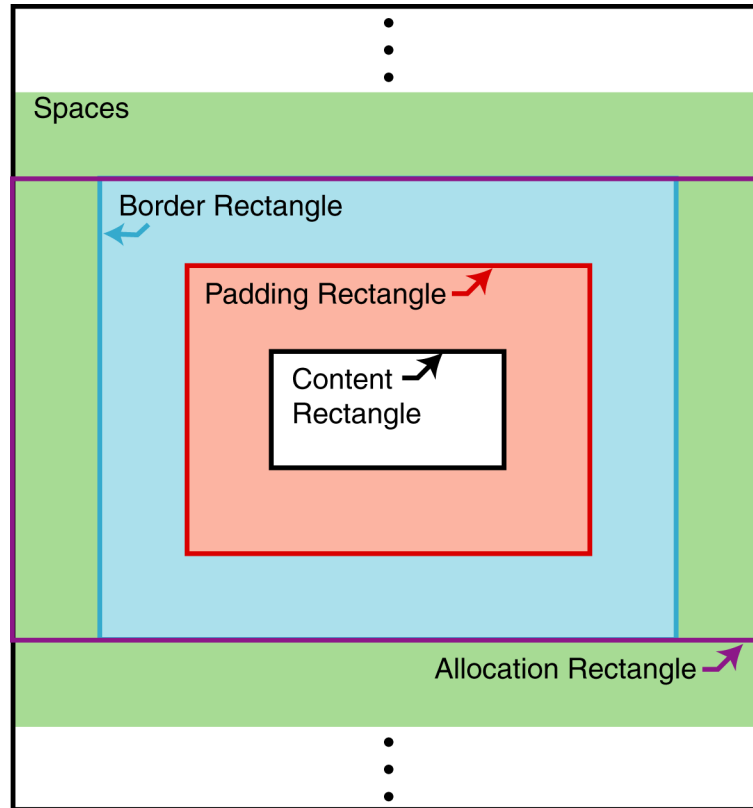
As described above, the *content-rectangle* is the rectangle bounding the inside of the padding and is used to describe the constraints on the positions of descendant areas. It is possible that marks from descendant glyphs or other areas may appear outside the content-rectangle.

Related to this is the *allocation-rectangle* of an area, which is used to describe the constraints on the position of the area within its parent area. For an inline-area this is either the *normal-allocation-rectangle* or the *large-allocation-rectangle*. The *normal-allocation-rectangle* extends to the content-rectangle in the block-progression-direction and to the border-rectangle in the inline-progression-direction. The *large-allocation-rectangle* is the border-rectangle. Unless otherwise specified, the allocation-rectangle for an area is the normal-allocation-rectangle.



For a block-area, the allocation-rectangle extends to the border-rectangle in the block-progression-direction and outside the content-rectangle in the inline-progression-direction by an amount equal to the *end-indent*, and in the opposite direction by an amount equal to the *start-indent*.

 The inclusion of space outside the border-rectangle of a block-area in the inline-progression-direction does not affect placement constraints, and is intended to promote compatibility with the CSS box model.



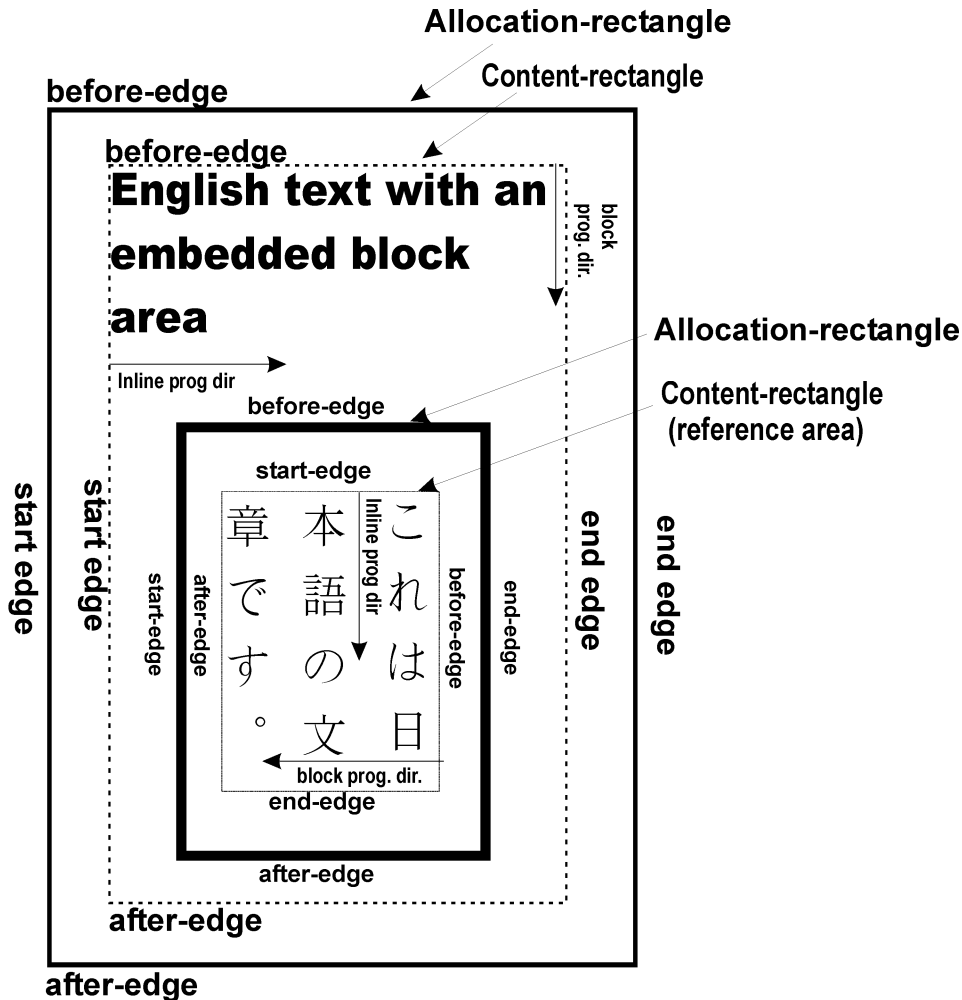
**Allocation- and content-rectangles of a block-area**

The edges of a rectangle are designated as follows:

- the *before-edge* is the edge occurring first in the block-progression-direction and perpendicular to it;
- the *after-edge* is the edge opposite the before-edge;
- the *start-edge* is the edge occurring first in the inline-progression-direction and perpendicular to it,
- the *end-edge* is the edge opposite the start-edge.

For purposes of this definition, the content-rectangle of an area uses the inline-progression-direction and block-progression-direction of that area; but the border-rectangle, padding-rectangle, and allocation-rectangle use the directions of its parent area. Thus the edges designated for the content-rectangle may not correspond to the same-named edges on the padding-, border-, and allocation-rectangles. This is important in the case of nested areas with different writing-modes or reference-orientation.

The following diagram shows the correspondence between the various edge names for a mixed writing-mode example:



Each inline-area has an *alignment-point* determined by the formatter, on the start-edge of its allocation-rectangle; for a glyph-area, this is a point on the start-edge of the glyph on its alignment baseline (see below). This is script-dependent and does not necessarily correspond to the (0,0) coordinate point used for the data describing the glyph shape.

#### 4.2.4. Tree Ordering

In the area tree, the set of areas with a given parent is ordered. The terms *initial*, *final*, *preceding*, and *following* refer to this ordering.

In any ordered tree, this sibling order extends to an ordering of the entire tree in at least two ways.

- In the *pre-order traversal order* of a tree, the children of each node (their order unchanged relative to one another) follow the node, but precede any following siblings of the node or of its ancestors.
- In the *post-order traversal order* of a tree, the children of each node precede the node, but follow any preceding siblings of the node or of its ancestors.

"Preceding" and "following", when applied to non-siblings, will depend on the extension order used, which must be specified. However, in either of these given orders, the leaves of the tree (nodes without children) are unambiguously ordered.

### 4.2.5. Stacking Constraints

This section defines the notion of *block-stacking constraints* and *inline-stacking constraints* involving areas. These are defined as ordered relations, i.e., if *A* and *B* have a stacking constraint it does not necessarily mean that *B* and *A* have a stacking constraint. These definitions are recursive in nature and some cases may depend upon simpler cases of the same definition. This is not circularity but rather a consequence of recursion. The intention of the definitions is to identify areas at any level of the tree which may have only space between them.

The *area-class* trait is an enumerated value which is *xsl-normal* for an area which is stacked with other areas in sequence. A *normal* area is an area for which this trait is *xsl-normal*. A *page-level-out-of-line* area is an area with area-class *xsl-footnote*, *xsl-before-float*, or *xsl-fixed*; placement of these areas is controlled by the fo:page-sequence ancestor of its generating formatting object. A *reference-level-out-of-line* area is an area with area-class *xsl-side-float* or *xsl-absolute*; placement of these areas is controlled by the formatting object generating the relevant reference-area. An *anchor* area is an area with area-class *xsl-anchor*; placement of these areas is arbitrary and does not affect stacking. Areas with area-class equal to one of *xsl-normal*, *xsl-footnote*, or *xsl-before-float* are defined to be *stackable*, indicating that they are supposed to be properly stacked.

#### *Block-stacking constraints*

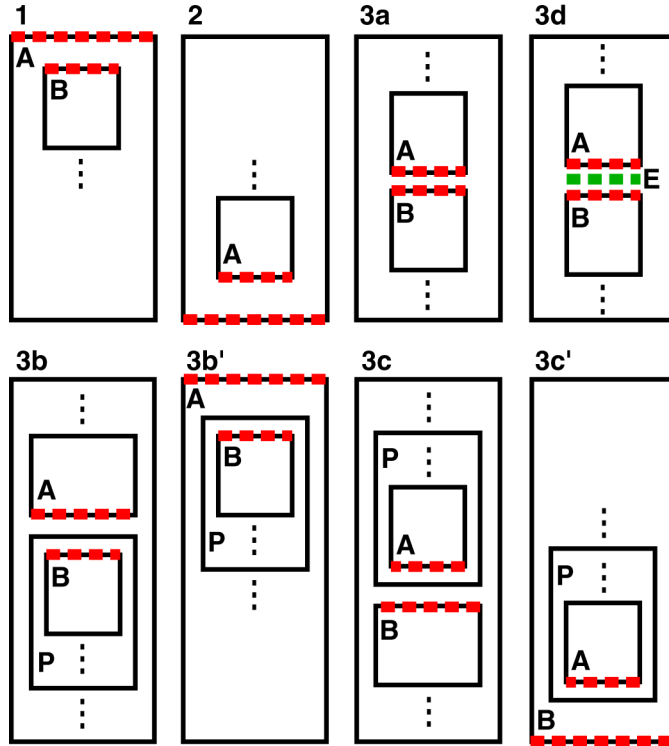
If *P* is a block-area, then there is a *fence preceding P* if *P* is a reference-area or if the border-before-width or padding-before-width of *P* are non-zero. Similarly, there is a *fence following P* if *P* is a reference-area or if the border-after-width or padding-after-width of *P* are non-zero.

If *A* and *B* are stackable areas, and *S* is a sequence of space-specifiers (see § 4.3 – Spaces and Conditionality on page 28), it is defined that *A* and *B* have *block-stacking constraint S* if any of the following conditions holds:

1. *B* is a block-area which is the first normal child of *A*, and *S* is the sequence consisting of the space-before of *B*.
2. *A* is a block-area which is the last normal child of *B*, and *S* is the sequence consisting of the space-after of *A*.
3. *A* and *B* are both block-areas, and either
  - a. *B* is the next stackable sibling area of *A*, and *S* is the sequence consisting of the space-after of *A* and the space-before of *B*;
  - b. *B* is the first normal child of a block-area *P*, *B* is not a line-area, there is no fence preceding *P*, *A* and *P* have a block-stacking constraint *S'*, and *S* consists of *S'* followed by the space-before of *B*; or
  - c. *A* is the last normal child of a block-area *P*, *A* is not a line-area, there is no fence following *P*, *P* and *B* have a block-stacking constraint *S''*, and *S* consists of the space-after of *A* followed by *S''*.
  - d. *A* has a block-stacking constraint *S'* with a block-area *E*, *E* has a block-stacking constraint *S''* with *B*, *E* is *empty* (i.e., it has zero border, padding, and block-progression-dimension, and no normal children), and *S* consists of *S'* followed by *S''*.



The use of "stackable" in two places in the above definition allows block-stacking constraints to apply between areas of area-class *xsl-before-float* or *xsl-footnote*.



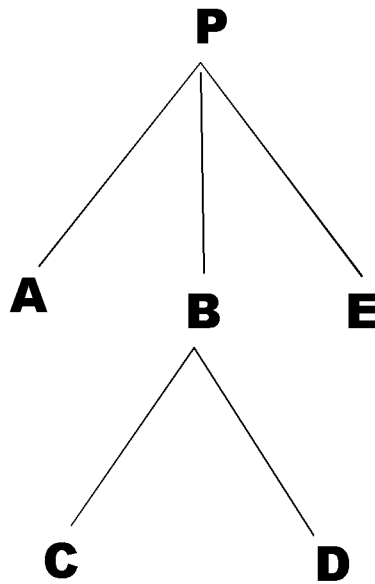
Adjacent Edges with Block-stacking

When  $A$  and  $B$  have a block-stacking constraint, the *adjacent edges* of  $A$  and  $B$  are an ordered pair recursively defined as:

- In case 1, the before-edge of the content-rectangle of  $A$  and the before-edge of the allocation-rectangle of  $B$ .
- In case 2, the after-edge of the allocation-rectangle of  $A$  and the after-edge of the content-rectangle of  $B$ .
- In case 3a, the after-edge of the allocation-rectangle of  $A$  and the before-edge of the allocation-rectangle of  $B$ .
- In case 3b, the first of the adjacent edges of  $A$  and  $P$ , and the before-edge of the allocation-rectangle of  $B$ .
- In case 3c, the after-edge of the allocation-rectangle of  $A$  and the second of the adjacent edges of  $P$  and  $B$ .
- In case 3d, the first of the adjacent edges of  $A$  and  $E$ , and the second of the adjacent edges of  $E$  and  $B$ .

*Example.* In this diagram each node represents a block-area. Assume that all padding and border widths are zero, and none of the areas are reference-areas. Then  $P$  and  $A$  have a block-stacking constraint, as do  $A$  and  $B$ ,  $A$  and  $C$ ,  $B$  and  $C$ ,  $C$  and  $D$ ,  $D$  and  $B$ ,  $B$  and  $E$ ,  $D$  and  $E$ , and  $E$  and  $P$ ; these are the only pairs in the diagram having block-stacking constraints. If  $B$  had non-zero padding-after, then  $D$  and  $E$  would not have any block-stacking constraint (though  $B$  and  $E$  would continue to have a block-stacking constraint).





### Block-stacking constraint example

#### *Inline-stacking constraints.*

This section will recursively define the inline-stacking constraints between two areas (either two inline-areas or one inline-area and one line-area), together with the notion of *fence preceding* and *fence following*; these definitions are interwoven with one another. This parallels the definition for block-stacking constraints, but with the additional complication that we may have a stacking constraint between inline-areas which are stacked in opposite inline-progression-directions. (This is not an issue for block-stacking constraints because a block-area which is not a reference-area may not have a block-progression-direction different from that of its parent.)

If  $P$  and  $Q$  have an inline-stacking constraint, then  $P$  has a *fence preceding*  $Q$  if  $P$  is a reference-area or has non-zero border-width or padding-width at the first adjacent edge of  $P$  and  $Q$ . Similarly,  $Q$  has a *fence following*  $P$  if  $Q$  is a reference-area or has non-zero border-width or padding-width at the second adjacent edge of  $P$  and  $Q$ .

If  $A$  and  $B$  are normal areas, and  $S$  is a sequence of space-specifiers, it is defined that  $A$  and  $B$  have *inline-stacking constraint*  $S$  if any of the following conditions holds:

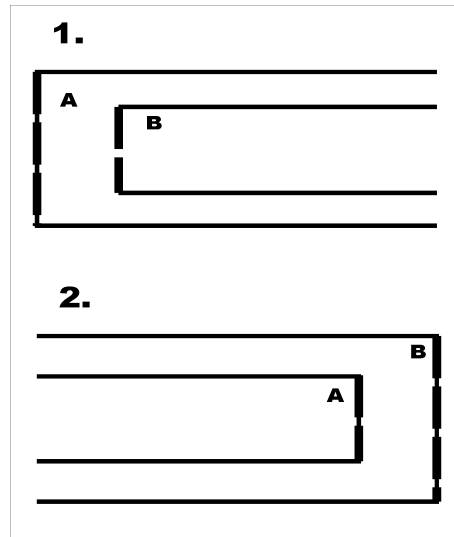
1.  $A$  is an inline-area or line-area,  $B$  is an inline-area which is the first normal child of  $A$ , and  $S$  is the sequence consisting of the space-start of  $B$ .
2.  $B$  is an inline-area or line-area,  $A$  is an inline-area which is the last normal child of  $B$ , and  $S$  is the sequence consisting of the space-end of  $A$ .
3.  $A$  and  $B$  are each either an inline-area or a line-area, and either
  - a. both  $A$  and  $B$  are inline-areas,  $B$  is the next normal sibling area of  $A$ , and  $S$  is the sequence consisting of the space-end of  $A$  and the space-start of  $B$ ;
  - b.  $B$  is an inline-area which is the first normal child of an inline-area  $P$ ,  $P$  has no fence following  $A$ ,  $A$  and  $P$  have an inline-stacking constraint  $S'$ , the inline-progression-direction of  $P$  is the same as the

inline-progression-direction of the nearest common ancestor area of  $A$  and  $P$ , and  $S$  consists of  $S'$  followed by the space-start of  $B$ .

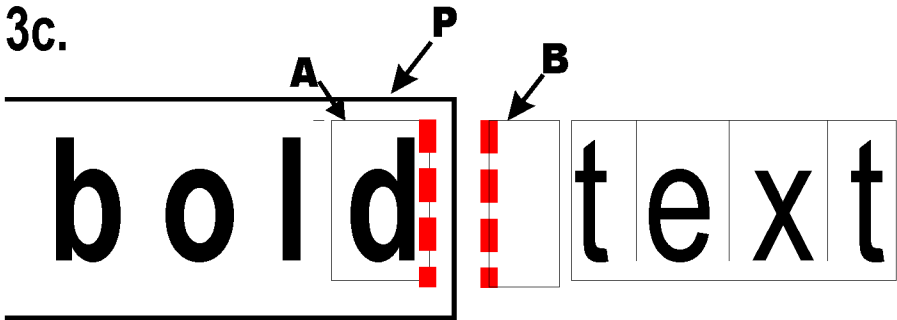
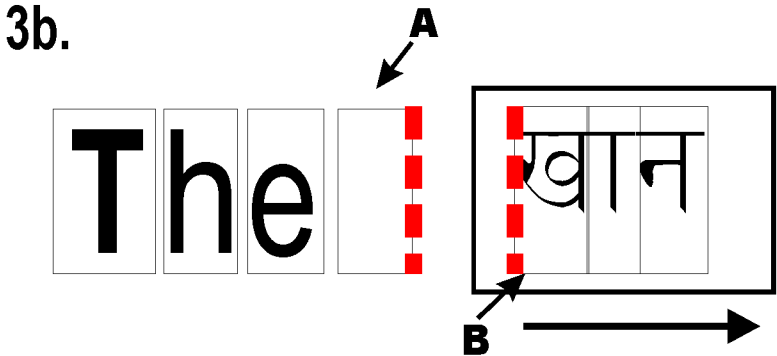
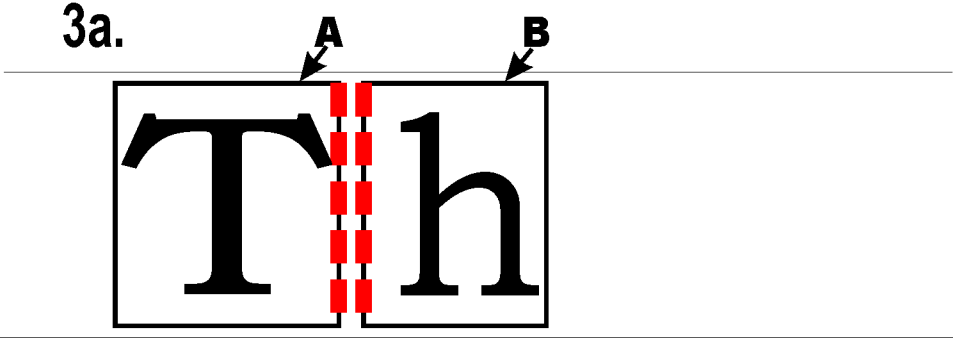
c.  $A$  is an inline-area which is the last normal child of an inline-area  $P$ ,  $P$  has no fence preceding  $B$ ,  $P$  and  $B$  have an inline-stacking constraint  $S''$ , the inline-progression-direction of  $P$  is the same as the inline-progression-direction of the nearest common ancestor area of  $P$  and  $B$ , and  $S$  consists of the space-end of  $A$  followed by  $S''$ .

d.  $B$  is an inline-area which is the last normal child of an inline-area  $P$ ,  $P$  has no fence following  $A$ ,  $A$  and  $P$  have an inline-stacking constraint  $S'$ , the inline-progression-direction of  $P$  is opposite to the inline-progression-direction of the nearest common ancestor area of  $A$  and  $P$ , and  $S$  consists of  $S'$  followed by the space-end of  $B$ .

e.  $A$  is an inline-area which is the first normal child of an inline-area  $P$ ,  $P$  has no fence preceding  $B$ ,  $P$  and  $B$  have an inline-stacking constraint  $S''$ , the inline-progression-direction of  $P$  is opposite to the inline-progression-direction of the nearest common ancestor area of  $P$  and  $B$ , and  $S$  consists of the space-start of  $A$  followed by  $S''$ .



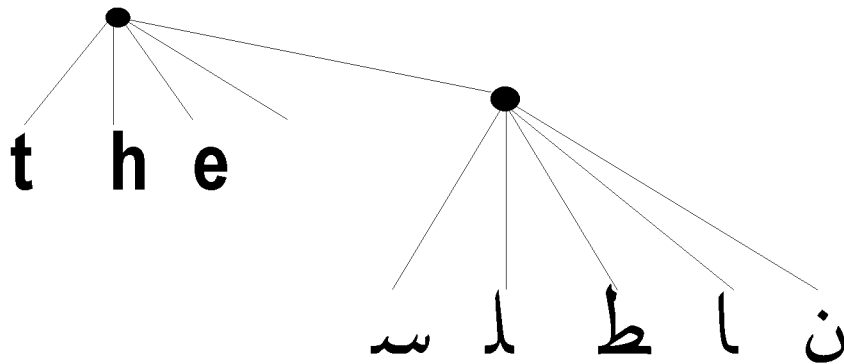
**Adjacent Edges with Inline-stacking**



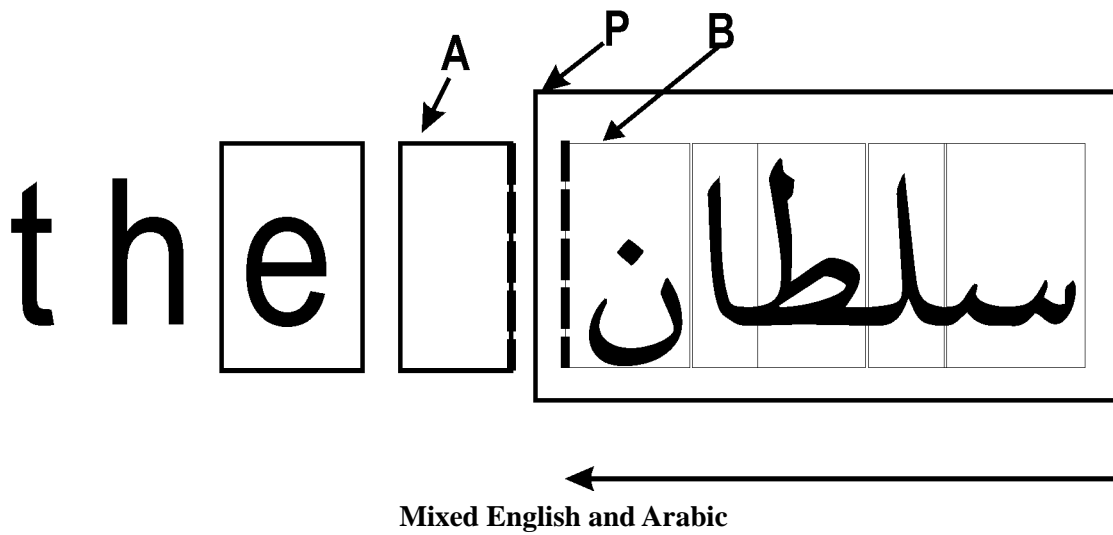
Adjacent Edges with Inline-stacking, continued

3d.

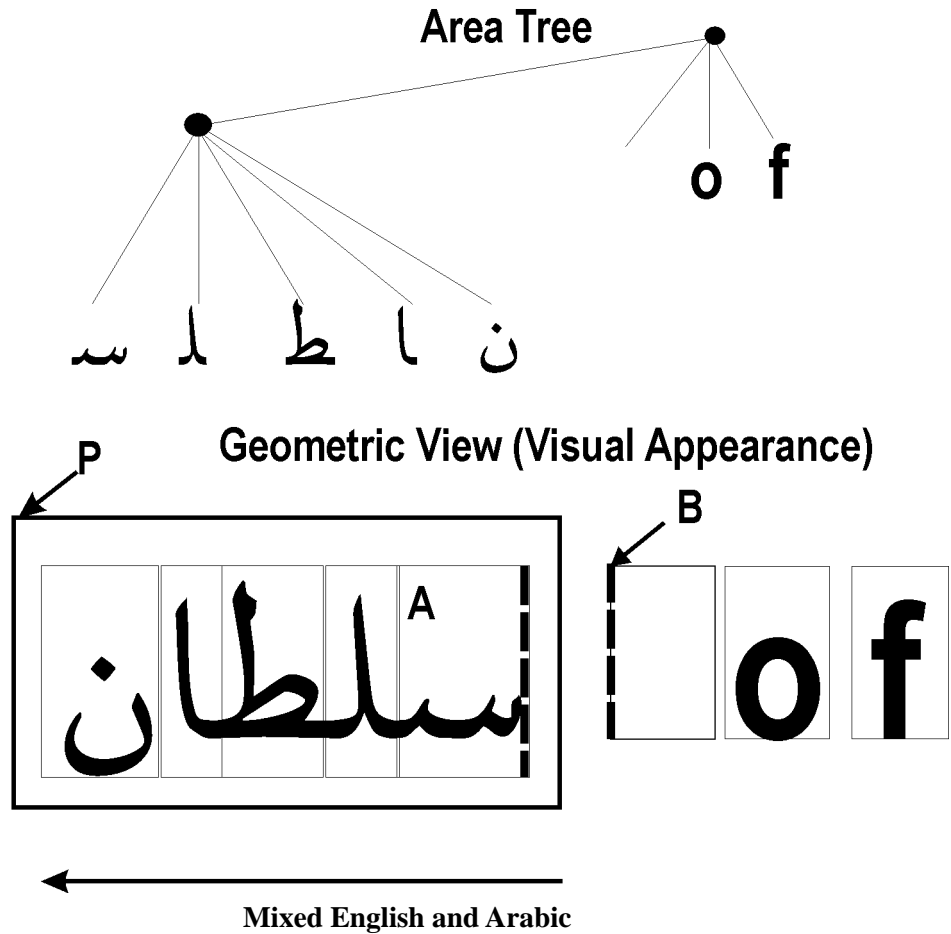
Area Tree



Geometric View (Visual Appearance)



3e.



When *A* and *B* have an inline-stacking constraint, the *adjacent edges* of *A* and *B* are an ordered pair defined as:

- In case 1, the start-edge of the content-rectangle of *A* and the start-edge of the allocation-rectangle of *B*.
- In case 2, the end-edge of the allocation-rectangle of *A* and the end-edge of the content-rectangle of *B*.
- In case 3a, the end-edge of the allocation-rectangle of *A* and the start-edge of the allocation-rectangle of *B*.
- In case 3b, the first of the adjacent edges of *A* and *P*, and the start-edge of the allocation-rectangle of *B*.
- In case 3c, the end-edge of the allocation-rectangle of *A* and the second of the adjacent edges of *P* and *B*.
- In case 3d, the first of the adjacent edges of *A* and *P*, and the end-edge of the allocation-rectangle of *B*.
- In case 3e, the start-edge of the allocation-rectangle of *A* and the second of the adjacent edges of *P* and *B*.

Two areas are *adjacent* if they have a block-stacking constraint or an inline-stacking constraint. It follows from the definitions that areas of the same type (inline or block) can be adjacent only if all their

non-common ancestors are also of the same type (up to but not including their nearest common ancestor). Thus, for example, two inline-areas which reside in different line-areas are never adjacent.

An area *A* *begins* an area *P* if *A* is a descendant of *P* and *P* and *A* have either a block-stacking constraint or an inline-stacking constraint, provided that no descendant of *P* which is an ancestor of *A* has a space-before (in the case of a block-stacking constraint) or a space-start (in the case of an inline-stacking constraint) whose computed minimum, maximum, or optimum values are nonzero. In this case the second of the adjacent edges of *P* and *A* is defined to be a *leading edge* in *P*. A space-specifier which applies to the leading edge is also defined to *begin P*.

Similarly, An area *A* *ends* an area *P* if *A* is a descendant of *P* and *A* and *P* have either a block-stacking constraint or an inline-stacking constraint, provided that no descendant of *P* which is an ancestor of *A* has a space-after (in the case of a block-stacking constraint) or a space-end (in the case of an inline-stacking constraint) whose computed minimum, maximum, or optimum values are nonzero. In this case the first of the adjacent edges of *A* and *P* is defined to be a *trailing edge* in *P*. A space-specifier which applies to the trailing edge is also defined to *end P*.

#### 4.2.6. Font Baseline Tables

Each script has its preferred "baseline" for aligning glyphs from that script. Western scripts typically use an "alphabetic" baseline that touches at or near the bottom of capital letters. Further, for each font there is a preferred way of aligning embedded glyphs from different scripts, e.g., for a Western font there are separate baselines for aligning embedded ideographic or Indic glyphs.

Each block-area and inline-area has a *dominant-baseline-identifier* trait whose value is a baseline identifier corresponding to the type of alignment expected for inline-area descendants of that area, and each inline-area has an *alignment-baseline* which specifies how the area is aligned to its parent. These traits are interpreted as described in section § 7.9.1 – Fonts and Font Data on page 268.

For each font, an *actual-baseline-table* maps these identifiers to points on the start-edge of the area. By abuse of terminology, the line in the inline-progression-direction through the point corresponding to the dominant-baseline-identifier is called the "dominant baseline."

### 4.3. Spaces and Conditionality

A space-specifier is a compound datatype whose components are minimum, optimum, maximum, conditionality, and precedence.

*Minimum*, *optimum*, and *maximum* are lengths and can be used to define a constraint on a distance, namely that the distance should preferably be the optimum, and in any case no less than the minimum nor more than the maximum. Any of these values may be negative, which can (for example) cause areas to overlap, but in any case the minimum should be less than or equal to the optimum value, and the optimum less than or equal to the maximum value.

*Conditionality* is an enumerated value which controls whether a space-specifier has effect at the beginning or end of a reference-area or a line-area. Possible values are *retain* and *discard*; a *conditional* space-specifier is one for which this value is *discard*.

*Precedence* has a value which is either an integer or the special token *force*. A *forcing* space-specifier is one for which this value is *force*.

Space-specifiers occurring in sequence may interact with each other. The constraint imposed by a sequence of space-specifiers is computed by calculating for each space-specifier its associated *resolved*

*space-specifier* in accordance with their conditionality and precedence, as shown below in the space-resolution rules.

The constraint imposed on a distance by a sequence of resolved space-specifiers is additive; that is, the distance is constrained to be no less than the sum of the resolved minimum values and no larger than the sum of the resolved maximum values.

### 4.3.1. Space-resolution Rules

The resolved space-specifier of a given space-specifier  $S$  is computed as follows. Consider the maximal inline-stacking constraint or block-stacking constraint  $S''$  containing the space-specifier  $S$  as an element of the sequence ( $S''$  is a sequence of space-specifiers; see § 4.2.5 – [Stacking Constraints](#) on page 21). Define  $S'$  to be a subsequence of  $S''$  as follows:

- if  $S$  is the space-before or space-after of a line-area, then  $S'$  is the maximal subsequence of  $S''$  containing  $S$  such that all the space-specifiers in  $S'$  are traits of line-areas,
- if  $S$  is the space-before or space-after of a block-area which is not a line-area, then  $S'$  is the maximal subsequence of  $S''$  containing  $S$  such that all the space-specifiers in  $S'$  are traits of block-areas which are not line-areas,
- if  $S$  is the space-start or space-end of an inline-area, then  $S'$  is all of  $S''$ .

The resolved space-specifier of  $S$  is a non-conditional, forcing space-specifier computed in terms of the sequence  $S'$ .

1. If any of the space-specifiers in  $S'$  is conditional, and begins a reference-area or line-area, then it is *suppressed*, which means that its resolved space-specifier is zero. Further, any conditional space-specifiers which consecutively follow it in the sequence are also suppressed. For purposes of this rule, a space-specifier  $U$  *consecutively follows* a space-specifier  $V$  if it  $U$  follows  $V$  and  $U$  and  $V$  are separated in the sequence only by conditional space-specifiers and/or space-specifiers whose computed minimum, maximum, and optimum values are zero.

If a conditional space-specifier ends a reference-area or line-area, then it is suppressed together with any other conditional space-specifiers which consecutively precede it in the sequence. For purposes of this rule, a space-specifier  $U$  *consecutively precedes* a space-specifier  $V$  if it  $U$  precedes  $V$  and  $U$  and  $V$  are separated in the sequence only by conditional space-specifiers and/or space-specifiers whose computed minimum, maximum, and optimum values are zero.

2. If any of the remaining space-specifiers in  $S'$  is forcing, all non-forcing space-specifiers are suppressed, and the value of each of the forcing space-specifiers is taken as its resolved value.
3. Alternatively if all of the remaining space-specifiers in  $S'$  are non-forcing, then the resolved space-specifier is defined in terms of those non-suppressed space-specifiers whose precedence is numerically highest, and among these those whose optimum value is the greatest. All other space-specifiers are suppressed. If there is only one of these then its value is taken as its resolved value.

Otherwise, follow these rules when there are two or more space-specifiers all of the same highest precedence and the same (largest) optimum: The resolved space-specifier of the last space-specifier in the sequence is derived from these spaces by taking their common optimum value as its optimum. The greatest of their minimum values is its minimum. The least of their maximum values is its maximum. All other space-specifiers are suppressed.

4. If  $S$  is subject to overconstraintment relaxing, then its maximum value is set to the actual block-progression-dimension of the containing block-area. See § 4.3.2 – [Overconstrained space-specifiers](#) on page 30

*Example.* Suppose the sequence of space values occurring at the beginning of a reference-area is: first, a space with value 10 points (that is minimum, optimum, and maximum all equal to 10 points) and conditionality *discard*; second, a space with value 4 points and conditionality *retain*; and third, a space with value 5 points and conditionality *discard*; all three spaces having precedence zero. Then the first (10 point) space is suppressed under rule 1, and the second (4 point) space is suppressed under rule 3. The resolved value of the third space is a non-conditional 5 points, even though it originally came from a conditional space.

The padding of a block-area does not interact with any space-specifier (except that by definition, the presence of padding at the before- or after-edge prevents areas on either side of it from having a stacking constraint.)

The border or padding at the before-edge or after-edge of a block-area  $B$  may be specified as conditional. If so, then it is set to zero if its associated edge is a leading edge in a reference-area, and the is-first trait of  $B$  is false, or if its associated edge is a trailing edge in a reference-area, and the is-last trait of  $B$  is false. In either of these cases, the border or padding is taken to be zero for purposes of the stacking constraint definitions.

The border or padding at the start-edge or end-edge of an inline-area  $I$  may be specified as conditional. If so, then it is set to zero if its associated edge is a leading edge in a line-area, and the is-first trait of  $I$  is false, or if its associated edge is a trailing edge in a line-area, and the is-last trait of  $I$  is false. In either of these cases, the border or padding is taken to be zero for purposes of the stacking constraint definitions.

### 4.3.2. Overconstrained space-specifiers

When an area  $P$  is generated by a formatting object whose block-progression-dimension is "auto", then the constraints involving the before-edge and after-edge of the content-rectangle of  $P$ , together with the constraints between the various descendants of  $P$ , result in a constraint on the actual value of the block-progression-dimension. If the block-progression-dimension is instead specified as a length, then this might result in an overconstrained area tree, for example an incompletely-filled fo:block with a specified size. In that case some constraints between  $P$  and its descendants should be relaxed; those that are eligible for this treatment are said to be *subject to overconstraintment relaxing*, and treated as in the previous section.

- If the display-align value is "after" or "center" and  $P$  is the first normal area generated by the formatting object, then the space-before of the first normal child of  $P$  is subject to overconstraintment relaxing.
- If the display-align value is "before" or "center" and  $P$  is the last normal area generated by the formatting object, then the space-after of the last normal child of  $P$  is subject to overconstraintment relaxing.

## 4.4. Block-areas

Block-areas have several traits which typically affect the placement of their children. The *line-height* is used in line placement calculations. The *line-stacking-strategy* trait controls what kind of allocation is used for descendant line-areas and has an enumerated value (either *font-height*, *max-height*, or *line-height*). This is all rigorously described below. All areas have these traits, but they only have relevance for areas which have stacked line-area children.



The *space-before* and *space-after* traits determine the distance between the block-area and surrounding block-areas.

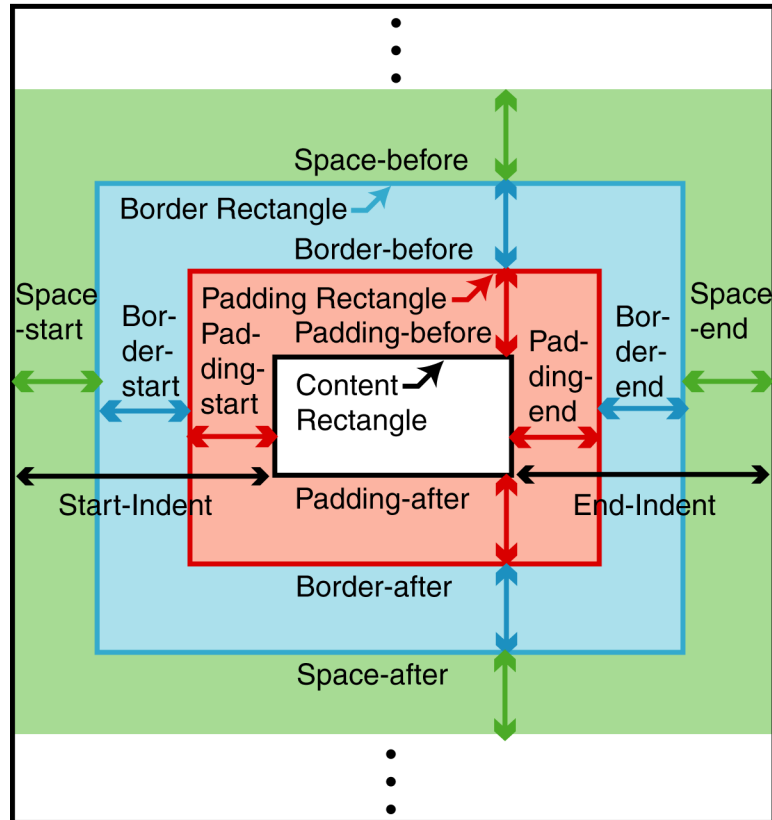
A block-area which is not a line-area typically has its size in the inline-progression-direction determined by its *start-indent* and *end-indent* and by the size of its nearest ancestor reference-area. A block-area which is not a line-area must be properly stacked (as defined in § 4.4.1 – [Stacked Block-areas](#) on page 31 below) unless otherwise specified in the description of its generating formatting object. In this case its block-progression-dimension will be subject to constraints based on the block-progression-dimensions and space-specifiers of its descendants. See § 4.3.2 – [Overconstrained space-specifiers](#) on page 30

#### 4.4.1. Stacked Block-areas

Block-area children of an area are typically stacked in the block-progression-direction within their parent area, and this is the default method of positioning block-areas. However, formatting objects are free to specify other methods of positioning child areas of areas which they generate, for example list-items or tables.

For a parent area  $P$  whose children are block-areas,  $P$  is defined to be *properly stacked* if all of the following conditions hold:

1. For each block-area  $B$  which is a descendant of  $P$ , the following hold:
  - the before-edge and after-edge of its allocation-rectangle are parallel to the before-edge and after-edges of the content-rectangle of  $P$ ,
  - the start-edge of its allocation-rectangle is parallel to the start-edge of the content-rectangle of  $R$  (where  $R$  is the closest ancestor reference-area of  $B$ ), and offset from it inward by a distance equal to the block-area's start-indent plus its *start-intrusion-adjustment* (as defined below), minus its border-start, padding-start, and space-start values, and
  - the end-edge of its allocation-rectangle is parallel to the end-edge of the content-rectangle of  $R$ , and offset from it inward by a distance equal to the block-area's end-indent plus its *end-intrusion-adjustment* (as defined below), minus its border-end, padding-end, and space-end values.



**Content Rectangle of Reference Area**

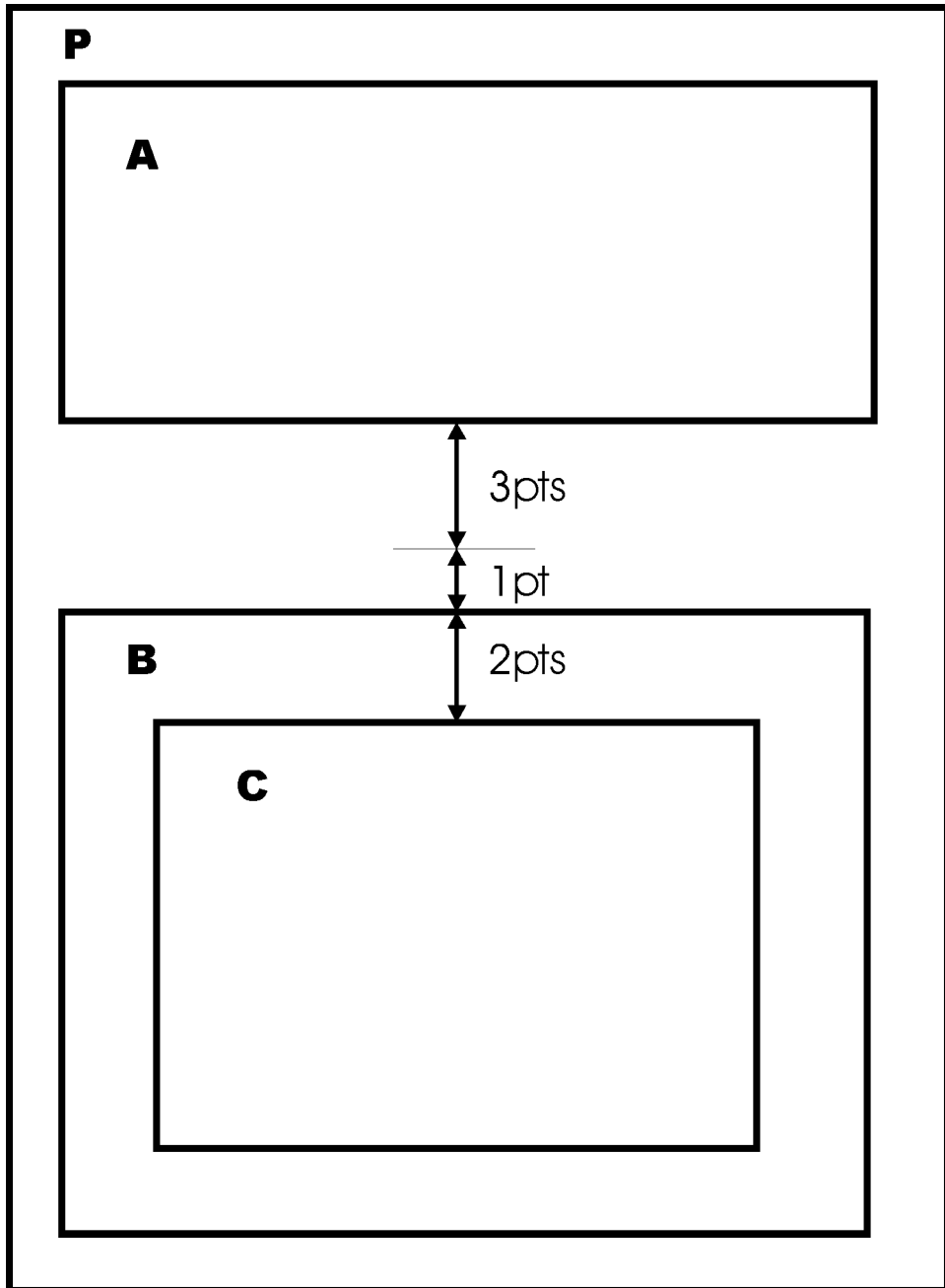


The notion of indent is intended to apply to the content-rectangle, but the constraint is written in terms of the allocation-rectangle, because as noted earlier (§ 4.2.3 – [Geometric Definitions](#) on page 18) the edges of the content-rectangle may not correspond to like-named edges of the allocation-rectangle.

The *start-intrusion-adjustment* and *end-intrusion-adjustment* are traits used to deal with intrusions from floats in the inline-progression-direction.

See also section § 5.3.2 – [Margin, Space, and Indent Properties](#) on page 49 for how the margin properties affect the indents.

- For each pair of normal areas  $B$  and  $B'$  in the subtree below  $P$ , if  $B$  and  $B'$  have a block-stacking constraint  $S$  and  $B$  is not empty (see § 4.2.5 – [Stacking Constraints](#) on page 21), then the distance between the adjacent edges of  $B$  and  $B'$  is consistent with the constraint imposed by the resolved values of the space-specifiers in  $S$ .



*Example.* In the diagram, if area *A* has a space-after value of 3 points, *B* a space-before of 1 point, and *C* a space-before of 2 points, all with precedence of *force*, and with zero border and padding, then the constraints will place *B*'s allocation-rectangle 4 points below that of *A*, and *C*'s allocation-rectangle 6 points below that of *A*. Thus the 4-point gap receives the background color from *P*, and the 2-point gap before *C* receives the background color from *B*.

#### 4.4.2. Intrusion Adjustments

Intrusion adjustments (both start- and end-) are defined to account for the indentation that occurs as the result of side floats.

If  $A$  and  $B$  are areas which have the same nearest reference area ancestor, then  $A$  and  $B$  are defined to be *inline-overlapping* if there is some line parallel to the inline-progression-direction, which intersects both the allocation-rectangle of  $A$  and the allocation-rectangle of  $B$ .

If  $A$  is an area of class *xsl-side-float* with `float="start"`, and  $B$  is a block-area, and  $A$  and  $B$  have the same nearest reference area ancestor, then  $A$  is defined to *encroach* upon  $B$  if  $A$  and  $B$  are inline-overlapping and the start-indent of  $B$  is less than the sum of the start-indent of  $A$  and the inline-progression-dimension of  $A$ . The *start-encroachment* of  $A$  on  $B$  is then defined to be amount by which the start-indent of  $B$  is less than the sum of the start-indent of  $A$  and the inline-progression-dimension of  $A$ .

If  $A$  is an area of class *xsl-side-float* with `float="end"`, and  $B$  is a block-area, and  $A$  and  $B$  have the same nearest reference area ancestor, then  $A$  is defined to *encroach* upon  $B$  if  $A$  and  $B$  are inline-overlapping and the end-indent of  $B$  is less than the sum of the end-indent of  $A$  and the inline-progression-dimension of  $A$ . The *end-encroachment* of  $A$  on  $B$  is then defined to be amount by which the end-indent of  $B$  is less than the sum of the end-indent of  $A$  and the inline-progression-dimension of  $A$ .

If  $B$  is a block-area which is not a line-area, then its *local-start-intrusion-adjustment* is computed as the maximum of the following lengths:

1. zero;
2. if the parent of  $B$  is not a reference area: the start-intrusion-adjustment of the parent of  $B$ ; and
3. if  $B$  has `intrusion-displace="block"`, then for each area  $A$  of class *xsl-side-float* with `float="start"` such that the generating formatting object of  $A$  is not a descendant of the generating formatting object of  $B$ , and such that  $A$  encroaches upon some line-area child of  $B$ : the start-encroachment of  $A$  on  $B$ ; and
4. if  $B$  has `intrusion-displace = "block"`, then for each area  $A$  of class *xsl-side-float* with `float="start"` such that  $A$  and  $B$  are inline-overlapping, and for each block-area ancestor  $B'$  of  $B$  which is a descendant of the nearest reference area ancestor of  $B$ , such that  $A$  encroaches on a line-area child of  $B'$ : the start-encroachment of  $A$  on  $B'$ .

The start-intrusion-adjustment of a block-area  $B$  is then defined to be the maximum of the local-start-intrusion-adjustments of the normal block-areas generated and returned by the generating formatting object of  $B$ .

If  $L$  is a line-area, then its start-intrusion-adjustment is computed as the maximum of the following lengths:

1. the start-intrusion-adjustment of the parent of  $L$ ;
2. for each area  $A$  of class *xsl-side-float* with `float="start"` such that  $A$  encroaches upon  $L$ : the start-encroachment of  $A$  on  $L$ ; and
3. if the parent of  $L$  has `intrusion-displace = "indent"`, then for each area  $A$  of class *xsl-side-float* with `float="start"` such that  $A$  and  $L$  are inline-overlapping, and for each block-area ancestor  $B'$  of  $L$  which is a descendant of the nearest reference area ancestor of  $L$ , such that  $A$  encroaches on some line-area child  $L'$  of  $B'$ : the start-encroachment of  $A$  on  $B'$ .

The end-intrusion-adjustment for a block-area is computed in a precisely analogous manner. That is:

If  $B$  is a block-area which is not a line-area, then its *local-end-intrusion-adjustment* is computed as the maximum of the following lengths:

1. zero;

2. if the parent of *B* is not a reference area: the end-intrusion-adjustment of the parent of *B*; and
3. if *B* has intrusion-displace="block", then for each area *A* of class *xsl-side-float* with float="end" such that the generating formatting object of *A* is not a descendant of the generating formatting object of *B*, and such that *A* encroaches upon some line-area child of *B*: the end-encroachment of *A* on *B*; and
4. if *B* has intrusion-displace = "block", then for each area *A* of class *xsl-side-float* with float="end" such that *A* and *B* are inline-overlapping, and for each block-area ancestor *B'* of *B* which is a descendant of the nearest reference area ancestor of *B*, such that *A* encroaches on a line-area child of *B'*: the end-encroachment of *A* on *B'*.

The end-intrusion-adjustment of a block-area *B* is then defined to be the maximum of the local-end-intrusion-adjustments of the normal block-areas generated and returned by the generating formatting object of *B*.

If *L* is a line-area, then its end-intrusion-adjustment is computed as the maximum of the following lengths:

1. the end-intrusion-adjustment of the parent of *L*;
2. for each area *A* of class *xsl-side-float* with float="end" such that *A* encroaches upon *L*: the end-encroachment of *A* on *L*; and
3. if the parent of *L* has intrusion-displace = "indent", then for each area *A* of class *xsl-side-float* with float="end" such that *A* and *L* are inline-overlapping, and for each block-area ancestor *B'* of *L* which is a descendant of the nearest reference area ancestor of *L*, such that *A* encroaches on some line-area child *L'* of *B'*: the end-encroachment of *A* on *B'*.

## 4.5. Line-areas

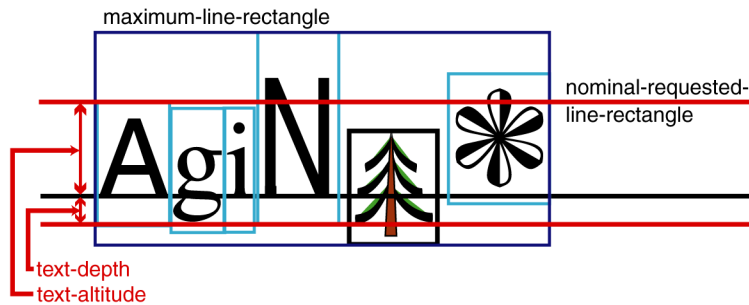
A line-area is a special type of block-area, and is generated by the same formatting object which generated its parent. Line-areas do not have borders and padding, i.e., border-before-width, padding-before-width, etc. are all zero. Inline-areas are stacked within a line-area relative to a *baseline-start-point* which is a point determined by the formatter, on the start-edge of the line area's content-rectangle.

The allocation-rectangle of a line is determined by the value of the *line-stacking-strategy* trait: if the value is *font-height*, the allocation-rectangle is the *nominal-requested-line-rectangle*, defined below; if the value is *max-height*, the allocation-rectangle is the *maximum-line-rectangle*, defined below; and if the value is *line-height*, the allocation-rectangle is the *per-inline-height-rectangle*, defined below. If the *line-stacking-strategy* trait is *font-height* or *max-height* the *space-before* and *space-after* are both set to the half-leading value; otherwise they are both set to zero.

The *nominal-requested-line-rectangle* for a line-area is the rectangle whose start-edge is parallel to the start-edge of the content-rectangle of the nearest ancestor reference-area and offset from it by the sum of the start-indent and the start-intrusion-adjustment of the line area, whose end-edge is parallel to the end-edge of the content-rectangle of the nearest ancestor reference-area and offset from it by the sum of the end-indent and the end-intrusion-adjustment of the line area, whose before-edge is separated from the baseline-start-point by the text-altitude of the parent block-area, and whose after-edge is separated from the baseline-start-point by the text-depth of the parent block-area. It has the same block-progression-dimension for each line-area child of a block-area.

The *maximum-line-rectangle* for a line-area is the rectangle whose start-edge and end-edge are parallel to and coincident with the start-edge and end-edge of the nominal-requested-line-rectangle, and whose extent in the block-progression-direction is the minimum required to enclose both the nominal-requested-

line-rectangle and the allocation-rectangles of all the inline-areas stacked within the line-area; this may vary depending on the descendants of the line-area.



### Nominal and Maximum Line Rectangles

The *per-inline-height-rectangle* for a line-area is the rectangle whose start-edge and end-edge are parallel to and coincident with the start-edge and end-edge of the nominal-requested-line-rectangle, and whose extent in the block-progression-dimension is determined as follows.

The *expanded-rectangle* of an inline-area is the rectangle with start-edge and end-edge coincident with those of its allocation-rectangle, and whose before-edge and after-edge are outside those of its allocation-rectangle by a distance equal to either (a.) the half-leading, when the area's allocation-rectangle is specified to be the normal-allocation-rectangle by the description of the generating formatting object, or (b.) the space-before and space-after (respectively), when the area's allocation-rectangle is specified to be the large-allocation-rectangle. The *expanded-nominal-requested-line-rectangle* is the rectangle with start-edge and end-edge coincident with those of the nominal-requested-line-rectangle, and whose before-edge and after-edge are outside those of the nominal-requested-line-rectangle by a distance equal to the half-leading.

The extent of the per-inline-height-rectangle in the block-progression-direction is then defined to be the minimum required to enclose both the expanded-nominal-requested-line-rectangle and the expanded-rectangles of all the inline-areas stacked within the line-area; this may vary depending on the descendants of the line-area.

☞ Using the nominal-requested-line-rectangle allows equal baseline-to-baseline spacing. Using the maximum-line-rectangle allows constant space between line-areas. Using the per-inline-height-rectangle and zero space-before and space-after allows CSS-style line box stacking. Also, the value of half-leading is included in the expanded-rectangle regardless of conditionality, and thus a line-height conditionality of "discard" does not have effect in this case.

## 4.6. Inline-areas


An inline-area has its own *line-height* trait, which may be different from the line-height of its containing block-area. This may affect the placement of its ancestor line-area when the line-stacking-strategy is *line-height*. An inline-area has an *actual-baseline-table* for its *nominal-font*. It has a *dominant-baseline-identifier* trait which determines how its stacked inline-area descendants are to be aligned.

An inline-area may or may not have child areas, and if so it may or may not be a reference-area. The dimensions of the content-rectangle for an inline-area without children is computed as specified by the generating formatting object, as are those of an inline-area with block-area children.

An inline-area with inline-area children has a content-rectangle which extends from its dominant baseline (see § 4.2.6 – [Font Baseline Tables](#) on page 28) by its text-depth in the block-progression-direction, and

in the opposite direction by its text-altitude; in the inline-progression-direction it extends from the start-edge of the allocation-rectangle of its first child to the end-edge of the allocation-rectangle of its last child. The allocation-rectangle of such an inline-area is the same as its content-rectangle.

The allocation-rectangle of an inline-area without children is either the normal-allocation-rectangle or the large-allocation-rectangle, as specified in the description of the generating formatting object.

 When the line-stacking-strategy is *line-height*, allocation is done with respect to the expanded-rectangle.

Examples of inline-areas with children might include portions of inline mathematical expressions or areas arising from mixed writing systems (left-to-right within right-to-left, for example).

### 4.6.1. Stacked Inline-areas

Inline-area children of an area are typically stacked in the inline-progression-direction within their parent area, and this is the default method of positioning inline-areas.

Inline-areas are stacked relative to the *dominant baseline*, as defined above (§ 4.2.6 – [Font Baseline Tables](#) on page 28).

For a parent area *P* whose children are inline-areas, *P* is defined to be *properly stacked* if all of the following conditions hold:

1. For each inline-area descendant *I* of *P*, the start-edge, end-edge, before-edge and after-edge of the allocation-rectangle of *I* are parallel to corresponding edges of the content-rectangle of the nearest ancestor reference-area of *I*.
2. For each pair of normal areas *I* and *I'* in the subtree below *P*, if *I* and *I'* have an inline-stacking constraint *S*, then the distance between the adjacent edges of *I* and *I'* is consistent with the constraint imposed by the resolved values of the space-specifiers in *S*.
3. For any inline-area descendant *I* of *P*, the distance in the shift-direction from the dominant baseline of the parent *Q* of *I*, to the alignment-point of *I* equals the offset between the dominant baseline of *Q* and the baseline of *Q* corresponding to the alignment-baseline trait of *I*, plus the baseline-shift for *I*.

The first summand is computed to compensate for mixed writing systems with different baseline types, and the other summands involve deliberate baseline shifts for things like superscripts and subscripts.

### 4.6.2. Glyph-areas

The most common inline-area is a glyph-area, which contains the representation for a character (or characters) in a particular font.

A glyph-area has an associated *nominal-font*, determined by the area's typographic traits, which apply to its character data, and a *glyph-orientation* determined by its writing-mode and reference-orientation, which determine the orientation of the glyph when it is rendered.

The alignment-point and dominant-baseline-identifier of a glyph-area are assigned according to the writing-system in use (e.g., the glyph baseline in Western languages), and are used to control placement of inline-areas descendants of a line-area. The formatter may generate inline-areas with different inline-progression-directions from their parent to accommodate correct inline-area stacking in the case of mixed writing systems.

A glyph-area has no children. Its block-progression-dimension and actual-baseline-table are the same for all glyphs in a font. Conforming implementations may choose to compute the block-progression-dimension for a glyph area based on the actual glyph size rather than using a common size for all glyphs in a font.

## 4.7. Ordering Constraints

### 4.7.1. General Ordering Constraints

A subset  $S$  of the areas returned to a formatting object is called *properly ordered* if the areas in that subset have the same order as their generating formatting objects. Specifically, if  $A_1$  and  $A_2$  are areas in  $S$ , returned by child formatting objects  $F_1$  and  $F_2$  where  $F_1$  precedes  $F_2$ , then  $A_1$  must precede  $A_2$  in the pre-order traversal order of the area tree. If  $F_1$  equals  $F_2$  and  $A_1$  is returned prior to  $A_2$ , then  $A_1$  must precede  $A_2$  in the pre-order-traversal of the area tree.

For each formatting object  $F$  and each area-class  $C$ , the subset consisting of the areas returned to  $F$  with area-class  $C$  must be properly ordered, except where otherwise specified.

### 4.7.2. Line-building

This section describes the ordering constraints that apply to formatting an fo:block or similar block-level object.

A block-level formatting object  $F$  which constructs lines does so by constructing block-areas which it returns to its parent formatting object, and placing normal areas and/or anchor areas returned to  $F$  by its child formatting objects as children of those block-areas or of line-areas which it constructs as children of those block-areas.

For each such formatting object  $F$ , it must be possible to form an ordered partition  $P$  consisting of ordered subsets  $S_1, S_2, \dots, S_n$  of the normal areas and anchor areas returned by the child formatting objects, such that the following are all satisfied:

1. Each subset consists of a sequence of inline-areas, or of a single block-area.
2. The ordering of the partition follows the ordering of the formatting object tree. Specifically, if  $A$  is in  $S_i$  and  $B$  is in  $S_j$  with  $i < j$ , or if  $A$  and  $B$  are both in the same subset  $S_i$  with  $A$  before  $B$  in the subset order, then either  $A$  is returned by a preceding sibling formatting object of  $B$ , or  $A$  and  $B$  are returned by the same formatting object with  $A$  being returned before  $B$ .
3. The partitioning occurs at legal line-breaks. Specifically, if  $A$  is the last area of  $S_i$  and  $B$  is the first area of  $S_{i+1}$ , then the rules of the language, script and hyphenation constraints (§ 7.10 – [Common Hyphenation Properties](#) on page 280, § 7.16.1 – “[hyphenation-keep](#)” on page 318, and § 7.16.2 – “[hyphenation-ladder-count](#)” on page 318) in effect must permit a line-break between  $A$  and  $B$ , within the context of all areas in  $S_i$  and  $S_{i+1}$ .
4. Forced line-breaks are respected. Specifically, if  $C$  is a descendant of  $F$ , and  $C$  is an fo:character whose Unicode character is U+000A, and  $A$  is the area generated by  $C$ , then either  $C$  is a child of  $F$  and  $A$  is the last area in a subset  $S_i$ , or  $C$  is a descendant of a child  $C'$  of  $F$ , and  $A$  ends (in the sense of 4.2.5) an area  $A'$  returned by  $C'$ , such that  $A'$  is the last area in a subset  $S_i$ .
5. The partition follows the ordering of the area tree, except for certain glyph substitutions and deletions. Specifically, if  $B_1, B_2, \dots, B_p$  are the normal child areas of the area or areas returned by  $F$ ,



(ordered in the pre-order traversal order of the area tree), then there is a one-to-one correspondence between these child areas and the partition subsets (i.e.  $n = p$ ), and for each  $i$ ,

- $S_i$  consists of a single block-area and  $B_i$  is that block-area, or
  - $S_i$  consists of inline-areas and  $B_i$  is a line-area whose child areas are the same as the inline-areas in  $S_i$ , and in the same order, except that where the rules of the language and script in effect call for glyph-areas to be substituted, inserted, or deleted, then the substituted or inserted glyph-areas appear in the area tree in the corresponding place, and the deleted glyph-areas do not appear in the area tree. For example, insertions and substitutions may occur because of addition of hyphens or spelling changes due to hyphenation, or glyph image construction from syllabification, or ligature formation. Deletions occur as specified in 6., below.
6. white-space-treatment is enforced. In particular, deletions in 5. occur when there is a glyph area  $G$  such that
- (a.) the white-space-treatment of  $G$  is "ignore" and the character of  $G$  is classified as white space in XML; or
  - (b.) the white-space-treatment of  $G$  is "ignore-if-before-linefeed" or "ignore-if-surrounding-linefeed", the suppress-at-line-break of  $G$  is "suppress", and  $G$  would end a line-area; or
  - (c.) the white-space-treatment of  $G$  is "ignore-if-after-linefeed" or "ignore-if-surrounding-linefeed", the suppress-at-line-break of  $G$  is "suppress", and  $G$  would begin a line-area.

In these cases the area  $G$  is deleted; this may cause the condition in clauses (b.) or (c.) to become true and lead to further deletions.

Substitutions that replace a sequence of glyph-areas with a single glyph-area should only occur when the margin, border, and padding in the inline-progression-direction (start- and end-), baseline-shift, and letter-spacing values are zero, treat-as-word-space is *false*, and the values of all other relevant traits match (i.e., alignment-adjust, alignment-baseline, color trait, background traits, dominant-baseline-identifier, font traits, text-depth, text-altitude, glyph-orientation-horizontal, glyph-orientation-vertical, line-height, line-height-shift-adjustment, text-decoration, text-shadow).



Line-areas do not receive the background traits or text-decoration of their generating formatting object, or any other trait that requires generation of a mark during rendering.

### 4.7.3. Inline-building

This section describes the ordering constraints that apply to formatting an fo:inline or similar inline-level object.

An inline-level formatting object  $F$  which constructs one or more inline-areas does so by placing normal inline-areas and/or anchor inline-areas returned to  $F$  by its child formatting objects as children of inline-areas which it generates.

For each such formatting object  $F$ , it must be possible to form an ordered partition  $P$  consisting of ordered subsets  $S_1, S_2, \dots, S_n$  of the normal and/or anchor inline-areas and normal block-areas returned by the child formatting objects, such that the following are all satisfied:

1. Each subset consists of a sequence of inline-areas, or of a single block-area.
2. The ordering of the partition follows the ordering of the formatting object tree, as defined above.

3. The partitioning occurs at legal line-breaks, as defined above.
4. Forced line-breaks are respected, as defined above.
5. The partition follows the ordering of the area tree, except for certain glyph substitutions and deletions, as defined above.

## 4.8. Keeps and Breaks

Keep and break conditions apply to a class of areas, which are typically page-reference-areas, column-areas, and line-areas. The appropriate class for a given condition is referred to as a *context* and an area in this class is a *context-area*. As defined in Section § 6.4.1 – Introduction on page 82, *page-reference-areas* are areas generated by an fo:page-sequence using the specifications in an fo:page-master, and *column-areas* are normal-flow-reference-areas generated from a region-body, or region-reference-areas generated from other types of region-master.

A keep or break condition is an open statement about a formatting object and the tree relationships of the areas it generates with the relevant context-areas. These tree relationships are defined mainly in terms of *leading* or *trailing* areas. If *A* is a descendant of *P*, then *A* is defined to be *leading* in *P* if *A* has no preceding sibling which is a normal area, nor does any of its ancestor areas up to but not including *P*. Similarly, *A* is defined to be *trailing* in *P* if *A* has no following sibling which is a normal area, nor does any of its ancestor areas up to but not including *P*. For any given formatting object, the *next* formatting object in the flow is the first formatting object following (in the pre-order traversal order) which is not a descendant of the given formatting object and which generates and returns normal areas.

Break conditions are either break-before or break-after conditions. A break-before condition is *satisfied* if the first area generated and returned by the formatting object is leading within a context-area. A break-after condition depends on the next formatting object in the flow; the condition is satisfied if either there is no such next formatting object, or if the first normal area generated and returned by that formatting object is leading in a context-area.

Break conditions are imposed by the *break-before* and *break-after* properties. A refined value of *page* for these traits imposes a break condition with a context consisting of the page-reference-areas; a value of *even-page* or *odd-page* imposes a break condition with a context of even-numbered page-reference-areas or odd-numbered page-reference-areas, respectively; a value of *column* imposes a break condition with a context of column-areas. A value of *auto* in a break-before or break-after trait imposes no break condition.

Keep conditions are either keep-with-previous, keep-with-next, or keep-together conditions. A keep-with-previous condition on an object is satisfied if the first area generated and returned by the formatting object is not leading within a context-area, or if there are no preceding areas in a post-order traversal of the area tree. A keep-with-next condition is satisfied if the last area generated and returned by the formatting object is not trailing within a context-area, or if there are no following areas in a pre-order traversal of the area tree. A keep-together condition is satisfied if all areas generated and returned by the formatting object are descendants of a single context-area.

Keep conditions are imposed by the "within-page", "within-column", and "within-line" components of the "keep-with-previous", "keep-with-next", and "keep-together" properties. The refined value of each component specifies the *strength* of the keep condition imposed, with higher numbers being stronger than lower numbers and the value *always* being stronger than all numeric values. A component with value *auto* does not impose a keep condition. A "within-page" component imposes a keep-condition with con-

text consisting of the page-reference-areas; "within-column", with context consisting of the column-areas; and "within-line" with context consisting of the line-areas.

The area tree is constrained to satisfy all break conditions imposed. Each keep condition must also be satisfied, except when this would cause a break condition or a stronger keep condition to fail to be satisfied. If not all of a set of keep conditions of equal strength can be satisfied, then some maximal satisfiable subset of conditions of that strength must be satisfied (together with all break conditions and maximal subsets of stronger keep conditions, if any).

## 4.9. Rendering Model

This section makes explicit the relationship between the area tree and visually rendered output.

Areas generate three types of marks: (1) the area background, if any, (2) the marks intrinsic to the area (a glyph, image, or decoration) if any, and (3) the area border, if any.

An area tree is rendered by causing marks to appear on an output medium in accordance with the areas in the area tree. This section describes the geometric location of such marks, and how conflicts between marks are to be resolved.

### 4.9.1. Geometry

Each area is rendered in a particular location. Formatting object semantics describe the location of intrinsic marks relative to the object's location, i.e., the left, right, top, and bottom edges of its content-rectangle. This section describes how the area's location is determined, which determines the location of its intrinsic marks.

For each page, the page-viewport-area corresponds isometrically to the output medium.

The page-reference-area is offset from the page-viewport-area as described below in section § 4.9.2 – [Viewport Geometry](#) on page 41.

All areas in the tree with an area-class of *xsl-fixed* are positioned such that the left-, right-, top-, and bottom-edges of its content-rectangle are offset inward from the content-rectangle of its ancestor page-viewport-area by distances specified by the *left-position*, *right-position*, *top-position*, and *bottom-position* traits, respectively.

Any area in the tree which is the child of a viewport-area is rendered as described in section § 4.9.2 – [Viewport Geometry](#) on page 41.

All other areas in the tree are positioned such that the left-, right-, top-, and bottom-edges of its content-rectangle are offset inward from the content-rectangle of its nearest ancestor reference-area by distances specified by the *left-position*, *right-position*, *top-position*, and *bottom-position* traits, respectively. These are shifted down and left by the values of the *top-offset* and *left-offset* traits, respectively, if the area has a *relative-position* of *relative*.

### 4.9.2. Viewport Geometry

A reference-area which is the child of a viewport-area is positioned such that the start-edge and end-edge of its content-rectangle are parallel to the start-edge and end-edge of the content-rectangle of its parent viewport-area. The start-edge of its content-rectangle is offset from the start-edge of the content-rectangle of its parent viewport-area by an *inline-scroll-amount*, and the before-edge of its content-rectangle is offset from the before-edge of the content-rectangle of its parent viewport-area by a *block-scroll-amount*.

If the block-progression-dimension of the reference-area is larger than that of the viewport-area and the *overflow* trait for the reference-area is **scroll**, then the inline-scroll-amount and block-scroll-amount are determined by a scrolling mechanism, if any, provided by the user agent. Otherwise, both are zero.

### 4.9.3. Visibility

The visibility of marks depends upon the location of the marks, the *visibility* of the area, and the *overflow* of any ancestor viewport-areas.

If an area has visibility **hidden** it generates no marks.

If an area has an *overflow* of **hidden**, or when the environment is non-dynamic and the *overflow* is **scroll** then the area determines a *clipping rectangle*, which is defined to be the rectangle determined by the value of the *clip* trait of the area, and for any mark generated by one of its descendant areas, portions of the mark lying outside the clipping rectangle do not appear.

### 4.9.4. Border, Padding, and Background

The border- and padding-rectangles are determined relative to the content-rectangle by the values of the common padding and border width traits (border-before-width, etc.).

For any area, which is not a child of a viewport-area, the border is rendered between the border-rectangle and the padding-rectangle in accordance with the common border color and style traits. For a child of a viewport-area, the border is not rendered.

For an area, which is not part of a viewport/reference pair, the background is rendered. For an area that is either a viewport-area or a reference-area in a viewport/reference pair, if the refined value of *background-attachment* is **scroll** and the block-progression-dimension of the reference-area is larger than that of the viewport-area, then the background is rendered on the reference-area and not the viewport-area, and otherwise it is rendered on the viewport-area and not the reference-area.

The background, if any, is rendered in the padding-rectangle, in accordance with the *background-image*, *background-color*, *background-repeat*, *background-position-vertical*, and *background-position-horizontal* traits.

### 4.9.5. Intrinsic Marks

For each class of formatting objects, the marks intrinsic to its generated areas are specified in the formatting object description. For example, an fo:character object generates a glyph-area, and this is rendered by drawing a glyph within that area's content-rectangle in accordance with the area's font traits and *glyph-orientation* and *blink* traits.

In addition, other traits (for example the various score and score-color traits) specify other intrinsic marks. In the case of score traits (*underline-score*, *overline-score* and *through-score*), the score thickness and position are specified by the nominal-font in effect; where the font fails to specify these quantities, they are implementation-dependent.

### 4.9.6. Layering and Conflict of Marks

Marks are layered as described below, which defines a partial ordering of which marks are *beneath* which other marks.

Two marks are defined to *conflict* if they apply to the same point in the output medium. When two marks conflict, the one which is beneath the other does not affect points in the output medium where they both apply.

Marks generated by the same area are layered as follows: the area background is beneath the area's intrinsic marks, and the intrinsic marks are beneath the border. Layering among the area's intrinsic marks is defined by the semantics of the area's generating formatting object and its properties. For example, a glyph-area's glyph drawing comes beneath the marks generated for text-decoration.

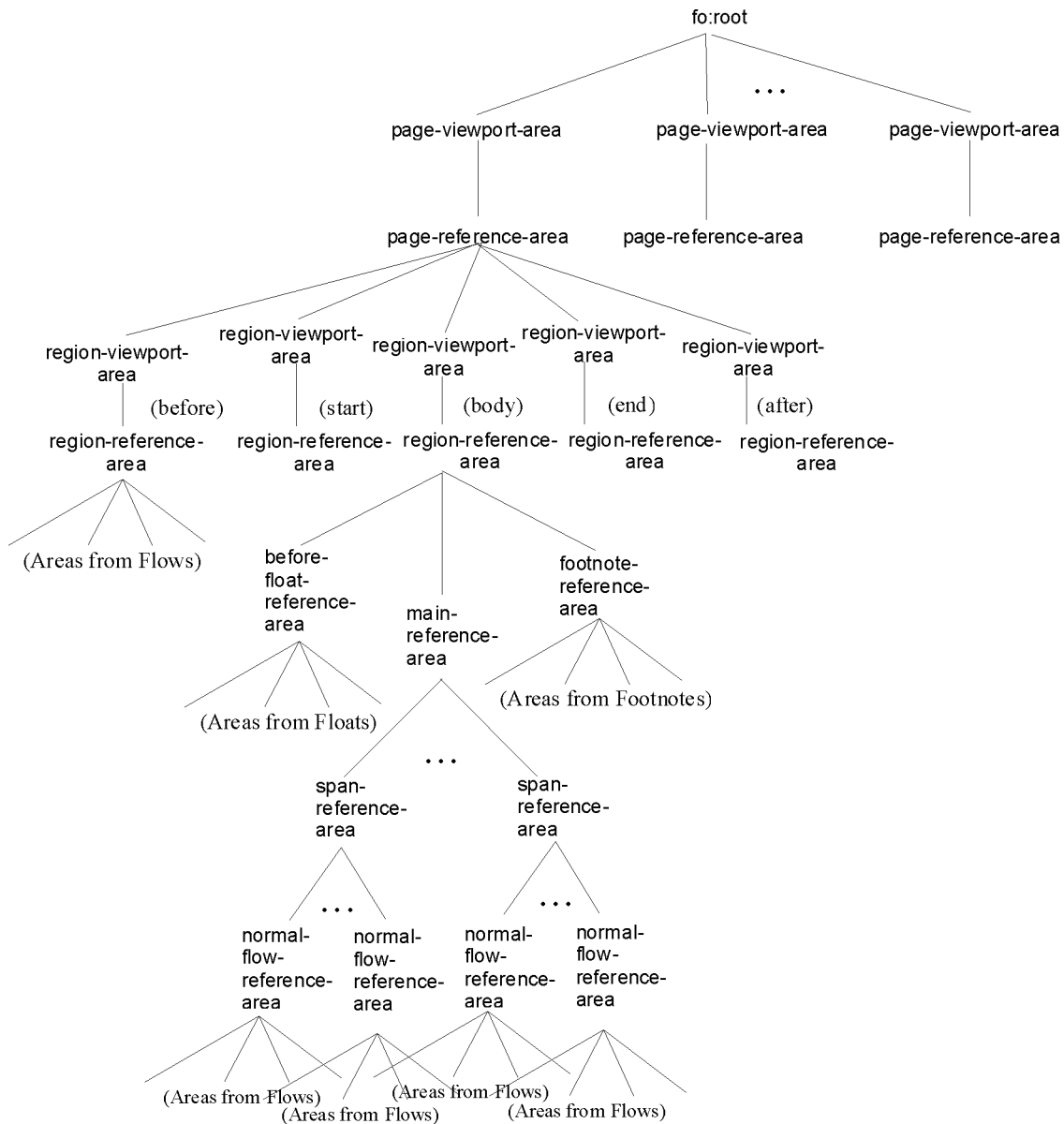
The stacking layer of an area is defined by its stacking context and its z-index value. The stacking layer of an area  $A$  is defined to be less than that of an area  $B$  if some ancestor-or-self  $A'$  of  $A$  and  $B'$  of  $B$  have the same stacking context and the z-index of  $A'$  is less than the z-index of  $B'$ . If neither stacking layer is less than the other then they are defined to have the same stacking layer.

If  $A$  and  $B$  are areas, and the stacking layer of  $A$  is less than the stacking layer of  $B$ , then all marks generated by  $A$  are beneath all marks generated by  $B$ .

If  $A$  and  $B$  are areas with the same stacking layer, the backgrounds of  $A$  and  $B$  come beneath all other marks generated by  $A$  and  $B$ . Further, if  $A$  is an ancestor of  $B$  (still with the same stacking layer), then the background of  $A$  is beneath all the areas of  $B$ , and all the areas of  $B$  are beneath the intrinsic areas (and border) of  $A$ .

If  $A$  and  $B$  have the same stacking layer and neither is an ancestor of the other, then it is an error if either their backgrounds conflict or if a non-background mark of  $A$  conflicts with a non-background mark of  $B$ . An implementation may recover by proceeding as if the marks from the first area in the pre-order traversal order are beneath those of the other area.

### 4.10. Sample Area Tree



**A Typical Area Tree**

## 5. Property Refinement / Resolution

Every formatting property may be specified on every formatting object. For each formatting object class, however, only a subset of the formatting properties are used; those that *apply* to the class.

During refinement the set of *properties* that apply to a formatting object is transformed into a set of *traits* that define constraints on the result of formatting. For many traits there is a one-to-one correspondence with a property; for other traits the transformation is more complex. Details on the transformation are described below.

The first step in refinement of a particular formatting object is to obtain the effective value of each property that applies to the object. Any shorthand property specified on the formatting object is expanded into the individual properties. This is further described in § 5.2 – [Shorthand Expansion](#) on page 46. For any property that has not been specified on the object the inherited (see § 5.1.4 – [Inheritance](#) on page 46) or initial value, as applicable, is used as the effective value. The second step is to transform this property set into traits.



Although the refinement process is described in a series of steps, this is solely for the convenience of exposition and does not imply they must be implemented as separate steps in any conforming implementation. A conforming implementation must only achieve the same effect.

## 5.1. Specified, Computed, and Actual Values, and Inheritance

For every property that is applicable to a given formatting object, it is necessary to determine the value of the property. Three variants of the property value are distinguished: the specified value, the computed value, and the actual value. The "specified value" is one that is placed on the formatting object during the tree-construction process. A specified value may not be in a form that is directly usable; for example, it may be a percentage or other expression that must be converted into an absolute value. A value resulting from such a conversion is called the "computed value". Finally, the computed value may not be realizable on the output medium and may need to be adjusted prior to use in rendering. For example, a line width may be adjusted to become an integral number of output medium pixels. This adjusted value is the "actual value."

### 5.1.1. Specified Values

The specified value of a property is determined using the following mechanisms (in order of precedence):

1. If the tree-construction process placed the property on the formatting object, use the value of that property as the specified value. This is called "explicit specification".
2. Otherwise, if the property is inheritable, use the value of that property from the parent formatting object, generally the computed value (see below).
3. Otherwise use the property's initial value, if it has one. The initial value of each property is indicated in the property's definition. If there is no initial value, that property is not specified on the formatting object. In general, this is an error.

Since it has no parent, the root of the result tree cannot use values from a parent formatting object; in this case, the initial value is used if necessary.

### 5.1.2. Computed Values

Specified values may be absolute (i.e., they are not specified relative to another value, as in "red" or "2mm") or relative (i.e., they are specified relative to another value, as in "auto", "2em", and "12%"), or they may be expressions. For most absolute values, no computation is needed to find the computed value. Relative values, on the other hand, must be transformed into computed values: percentages must be multiplied by a reference value (each property defines which value that is), values with a relative unit (em) must be made absolute by multiplying with the appropriate font size, "auto" values must be computed by the formulas given with each property, certain property values ("smaller", "bolder") must be replaced according to their definitions. The computed value of any property that controls a border width where the style of the border is "none" is forced to be "0pt".

Some properties have more than one way in which the property value can be specified. The simplest example of such properties are those which can be specified either in terms of a direction relative to the writing-mode (e.g., padding-before) or a direction in terms of the absolute geometric orientation of the viewport (e.g., padding-top). These two properties are called the relative property and the absolute property, respectively. Collectively, they are called "corresponding properties".

Specifying a value for one property determines both a computed value for the specified property and a computed value for the corresponding property. Which relative property corresponds to which absolute property depends on the writing-mode. For example, if the "writing-mode" at the top level of a document is "lr-tb", then "padding-start" corresponds to "padding-left", but if the "writing-mode" is "rl-tb", then "padding-start" corresponds to "padding-right". The exact specification of how to compute the values of corresponding properties is given in § 5.3 – [Computing the Values of Corresponding Properties](#) on page 47.

In most cases, elements inherit computed values. However, there are some properties whose specified value may be inherited (e.g., some values for the "line-height" property). In the cases where child elements do not inherit the computed value, this is described in the property definition.

### 5.1.3. Actual Values


A computed value is in principle ready to be used, but a user agent may not be able to make use of the value in a given environment. For example, a user agent may only be able to render borders with integer pixel widths and may, therefore, have to adjust the computed width to an integral number of media pixels. The actual value is the computed value after any such adjustments have been applied.

### 5.1.4. Inheritance

Some of the properties applicable to formatting objects are "inheritable." Such properties are so identified in the property description. The inheritable properties can be placed on any formatting object. The inheritable properties are propagated down the formatting object tree from a parent to each child. (These properties are given their initial value at the root of the result tree.) For a given inheritable property, if that property is present on a child, then that value of the property is used for that child (and its descendants until explicitly re-set in a lower descendant); otherwise, the specified value of that property on the child is the computed value of that property on the parent formatting object. Hence there is always a specified value defined for every inheritable property for every formatting object.

## 5.2. Shorthand Expansion

In XSL there are two kinds of shorthand properties; those originating from CSS, such as "border", and those that arise from breaking apart and/or combining CSS properties, such as "page-break-inside". In XSL both types of shorthands are handled in the same way.

 Shorthands are included only in the highest XSL conformance level: "complete" (see § 8 – [Conformance](#) on page 436).

The conformance level for each property is shown in [Appendix B.3 – Property Table: Part II](#) on page 455.

Shorthand properties do not inherit from the shorthand on the parent. Instead the individual properties that the shorthand expands into may inherit.

Some CSS shorthands are interrelated; their expansion has one or more individual properties in common. CSS indicates that the user must specify the order of processing for combinations of multiple interrelated



shorthands and individual interrelated properties. In XML, attributes are defined as unordered. To resolve this issue, XSL defines a precedence order when multiple interrelated shorthand properties or a shorthand property and an interrelated individual property are specified:

They are processed in increasing precision (i.e., "border" is less precise than "border-top", which is less precise than "border-top-color"). The individual properties are always more precise than any shorthand. For the remaining ambiguous case, XSL defines the ordering to be:

1. "border-style", "border-color", and "border-width" is less precise than
2. "border-top", "border-bottom", "border-right", and "border-left".

Processing is conceptually in the following steps:

1. Set the effective value of all properties to their initial values.
2. Process all shorthands in increasing precision.

If the shorthand is set to "inherit": set the effective value of each property that can be set by the shorthand to the computed value of the corresponding property in the parent.

If the value of the shorthand is not "inherit": determine which individual properties are to be set, and replace the initial value with the computed value derived from the specified value.

3. Process all specified individual properties.
4. Carry out any inheritance for properties that were not given a value other than by the first step.



For example, if both the "background" and the "background-color" properties are specified on a given formatting object: process the "background" shorthand, then process the "background-color" property.

### 5.3. Computing the Values of Corresponding Properties

Where there are corresponding properties, such as "padding-left" and "padding-start", a computed value is determined for all the corresponding properties. How the computed values are determined for a given formatting object is dependent on which of the corresponding properties are specified on the object. See description below.

The correspondence mapping from absolute to relative property is as follows:

If the "writing-mode" specifies a block-progression-direction of "top-to-bottom": "top" maps to "before", and "bottom" maps to "after".

If the "writing-mode" specifies a block-progression-direction of "bottom-to-top": "top" maps to "after", and "bottom" maps to "before".

If the "writing-mode" specifies a block-progression-direction of "left-to-right": "left" maps to "before", and "right" maps to "after".

If the "writing-mode" specifies a block-progression-direction of "right-to-left": "left" maps to "after", and "right" maps to "before".

If the "writing-mode" specifies an inline-progression-direction of "left-to-right": "left" maps to "start", and "right" maps to "end".

If the "writing-mode" specifies an inline-progression-direction of "right-to-left": "left" maps to "end", and "right" maps to "start".

If the "writing-mode" specifies an inline-progression-direction of "top-to-bottom": "top" maps to "start", and "bottom" maps to "end".

If the "writing-mode" specifies an inline-progression-direction of "bottom-to-top": "top" maps to "end", and "bottom" maps to "start".

If the "writing-mode" specifies an inline-progression-direction of "left-to-right" for odd-numbered lines, and "right-to-left" for even-numbered lines: "left" maps to "start", and "right" maps to "end".



"reference-orientation" is a rotation and does not influence the correspondence mapping.

### 5.3.1. Border and Padding Properties

The simplest class of corresponding properties are those for which there are only two variants in the correspondence, an absolute property and a relative property, and the property names differ only in the choice of absolute or relative designation; for example, "border-left-color" and "border-start-color".

For this class, the computed values of the corresponding properties are determined as follows. If the corresponding absolute variant of the property is specified on the formatting object, its computed value is used to set the computed value of the corresponding relative property. If the corresponding absolute property is not explicitly specified, then the computed value of the absolute property is set to the computed value of the corresponding relative property. If the corresponding relative property is specified on the formatting object and the absolute property only specified by the expansion of a shorthand, then the computed value of the absolute property is set to the computed value of the corresponding relative property.

Note that if both the absolute and the relative properties are not explicitly specified, then the rules for determining the specified value will use either inheritance if that is defined for the property or the initial value. The initial value must be the same for all possible corresponding properties. If both an absolute and a corresponding relative property are explicitly specified, then the above rule gives precedence to the absolute property, and the specified value of the corresponding relative property is ignored in determining the computed value of the corresponding properties.


The (corresponding) properties that use the above rule to determine their computed value are:


- border-after-color
- border-before-color
- border-end-color
- border-start-color
- border-after-style
- border-before-style
- border-end-style
- border-start-style
- border-after-width
- border-before-width
- border-end-width
- border-start-width

- padding-after
- padding-before
- padding-end
- padding-start

### 5.3.2. Margin, Space, and Indent Properties

The "space-before", and "space-after" properties (block-level formatting objects), "space-start", and "space-end" properties (inline-level formatting objects) are handled in the same way as the properties immediately above, but the corresponding absolute properties are in the set: "margin-top", "margin-bottom", "margin-left", and "margin-right". The .conditionality component of any space-before or space-after determined from a margin property is set to "retain".

 The treatment of the .conditionality component is for CSS2 compatibility.

 The computed value of a CSS2 margin in the block-progression-dimension specified as "auto" is 0pt. Any space-before or space-after determined from a margin value of "auto" is set to 0pt.

There are two more properties, "end-indent" and "start-indent" (block-level formatting objects) which correspond to the various absolute "margin" properties. For these properties, the correspondence is more complex and involves the corresponding "border-X-width" and "padding-X" properties, where X is one of "left", "right", "top" or "bottom". The computed values of these corresponding properties are determined as follows:

If the corresponding absolute "margin" property is specified on the formatting object and the formatting object generates a reference area the computed value of the margin is used to calculate the computed value of the corresponding "Y-indent" property, where Y is either "start" or "end". The computed value of the of the absolute "margin" property is determined by the CSS descriptions of the properties and the relevant sections (in particular section 10.3) of the CSS Recommendation referenced by these properties. The formulae for "start-indent" and "end-indent" are":

```
start-indent = margin-corresponding + padding-corresponding + border-
corresponding-width
```

```
end-indent = margin-corresponding + padding-corresponding + border-cor-
responding-width
```

If the corresponding absolute "margin" property is specified on the formatting object and the formatting object does not generate a reference area, the computed value of the margin and the computed values of the corresponding "border-X-width" and "padding-X" properties are used to calculate the computed value of the corresponding "Y-indent" property. The formulae for "start-indent" and "end-indent" are:

```
start-indent = inherited_value_of(start-indent) + margin-corresponding
+ padding-corresponding + border-corresponding-width
```

```
end-indent = inherited_value_of(end-indent) + margin-corresponding +
padding-corresponding + border-corresponding-width
```

If the corresponding absolute margin property is not explicitly specified, or if the corresponding relative property is specified on the formatting object and the absolute property only specified by the expansion

of a shorthand, the corresponding absolute margin property is calculated according to the following formulae:

$$\text{margin-corresponding} = \text{start-indent} - \text{inherited\_value\_of}(\text{start-indent}) - \text{padding-corresponding} - \text{border-corresponding-width}$$

$$\text{margin-corresponding} = \text{end-indent} - \text{inherited\_value\_of}(\text{end-indent}) - \text{padding-corresponding} - \text{border-corresponding-width}$$


If the "start-indent" or "end-indent" properties are not specified their inherited value is used in these formulae.

### 5.3.3. Height, and Width Properties

Based on the writing-mode in effect for the formatting object, either the "height", "min-height", and "max-height" properties, or the "width", "min-width", and "max-width" properties are converted to the corresponding block-progression-dimension, or inline-progression-dimension.

The "height" properties are absolute and indicate the dimension from "top" to "bottom"; the width properties the dimension from "left" to "right".

If the "writing-mode" specifies a block-progression-direction of "top-to-bottom" or "bottom-to-top" the conversion is as follows:

- If any of "height", "min-height", or "max-height" is specified:
  - If "height" is specified then first set:
    - block-progression-dimension.minimum=<height>
    - block-progression-dimension.optimum=<height>
    - block-progression-dimension.maximum=<height>
  - If "height" is not specified, then first set:
    - block-progression-dimension.minimum=auto
    - block-progression-dimension.optimum=auto
    - block-progression-dimension.maximum=auto
  - Then, if "min-height" is specified, reset:
    - block-progression-dimension.minimum=<min-height>
  - Then, if "max-height" is specified, reset:
    - block-progression-dimension.maximum=<max-height>
  - However, if "max-height" is specified as "none", reset:
    - block-progression-dimension.maximum=auto
- If any of "width", "min-width", or "max-width" is specified:
  - If "width" is specified then first set:
    - inline-progression-dimension.minimum=<width>
    - inline-progression-dimension.optimum=<width>

`inline-progression-dimension.maximum=<width>`

- If "width" is not specified, then first set:

`inline-progression-dimension.minimum=auto`

`inline-progression-dimension.optimum=auto`

`inline-progression-dimension.maximum=auto`

- Then, if "min-width" is specified, reset:

`inline-progression-dimension.minimum=<min-width>`

- Then, if "max-width" is specified, reset:

`inline-progression-dimension.maximum=<max-width>`

- However, if "max-width" is specified as "none", reset:

`inline-progression-dimension.maximum=auto`

If the "writing-mode" specifies a block-progression-direction of "left-to-right" or "right-to-left" the conversion is as follows:

- If any of "height", "min-height", or "max-height" is specified:

- If "height" is specified then first set:

`inline-progression-dimension.minimum=<height>`

`inline-progression-dimension.optimum=<height>`

`inline-progression-dimension.maximum=<height>`

- If "height" is not specified, then first set:

`inline-progression-dimension.minimum=auto`

`inline-progression-dimension.optimum=auto`

`inline-progression-dimension.maximum=auto`

- Then, if "min-height" is specified, reset:

`inline-progression-dimension.minimum=<min-height>`

- Then, if "max-height" is specified, reset:

`inline-progression-dimension.maximum=<max-height>`

- However, if "max-height" is specified as "none", reset:

`inline-progression-dimension.maximum=auto`

- If any of "width", "min-width", or "max-width" is specified:

- If "width" is specified then first set:

`block-progression-dimension.minimum=<width>`

`block-progression-dimension.optimum=<width>`

`block-progression-dimension.maximum=<width>`

- If "width" is not specified, then first set:  
   `block-progression-dimension.minimum=auto`  
   `block-progression-dimension.optimum=auto`  
   `block-progression-dimension.maximum=auto`
- Then, if "min-width" is specified, reset:  
   `block-progression-dimension.minimum=<min-width>`
- Then, if "max-width" is specified, reset:  
   `block-progression-dimension.maximum=<max-width>`
- However, if "max-width" is specified as "none", reset:  
   `block-progression-dimension.maximum=auto`

### 5.3.4. Overconstrained Geometry

The sum of the start-indent, end-indent, and inline-progression-dimension of the content-rectangle of an area should be equal to the inline-progression-dimension of the content-rectangle of the closest ancestor reference-area. In the case where a specification would lead to them being different the end-indent (and thus the corresponding margin) is adjusted such that the equality is true.

## 5.4. Simple Property to Trait Mapping

The majority of the properties map into traits of the same name. Most of these also simply copy the value from the property. These are classified as "Rendering", "Formatting", "Specification", "Font selection", "Reference", and "Action" in the property table in [Appendix B.3 – Property Table: Part II](#) on page 455. For example, the property `font-style="italic"` is refined into a *font-style* trait with a value of "italic".

Some traits have a value that is different from the value of the property. These are classified as "Value change" in the property table. For example, the property `background-position-horizontal="left"` is refined into a *background-position-horizontal* trait with a value of "Opt". The value mapping for these traits is given below.

### 5.4.1. Background-position-horizontal and background-position-vertical Properties

A value of "top", "bottom", "left", "right", or "center" is converted to a length as specified in the property definition.

### 5.4.2. Column-number Property

If a value has not been specified on a formatting object to which this property applies the initial value is computed as specified in the property definition.

### 5.4.3. Text-align Property

A value of "left", or "right" is converted to the writing-mode relative value as specified in the property definition.

#### 5.4.4. Text-align-last Property

A value of "left", or "right" is converted to the writing-mode relative value as specified in the property definition.

#### 5.4.5. z-index Property

The value is converted to one that is absolute; i.e., the refined value is the specified value plus the refined value of z-index of its parent formatting object, if any.

#### 5.4.6. Language Property

A value being a 2-letter code in conformance with [ISO639] is converted to the corresponding 3-letter [ISO639-2] terminology code, a 3-letter code in conformance with [ISO639-2] bibliographic code is converted to the corresponding 3-letter terminology code, a value of 'none' or 'mul' is converted to 'und'.

### 5.5. Complex Property to Trait Mapping

A small number of properties influence traits in a more complex manner. Details are given below.

#### 5.5.1. Word spacing and Letter spacing Properties

These properties may set values for the *space-start* and *space-end* traits, as described in the property definitions.

#### 5.5.2. Reference-orientation Property

The *reference-orientation* trait is copied from the reference-orientation property during refinement. During composition an absolute orientation is determined (see § 4.2.2 – Common Traits on page 16).

#### 5.5.3. Writing-mode and Direction Properties

The *writing-mode*, *direction*, and *unicode-bidi* traits are copied from the properties of the same name during refinement. During composition these are used in the determination of absolute orientations for the *block-progression-direction*, *inline-progression-direction*, and *shift-direction* traits in accordance with § 4.2.2 – Common Traits on page 16.

#### 5.5.4. Absolute-position Property

If absolute-position has the value "absolute" or "fixed", the values of the *left-position*, *top-position*, etc. traits are copied directly from the values of the "left", "top", etc. properties. Otherwise these traits' values are left undefined during refinement and determined during composition.

#### 5.5.5. Relative-position Property

If relative-position has the value "relative" then the values of the *left-offset* and *top-offset* traits are copied directly from the "left" and "top" properties. If the "right" property is specified but "left" is not, then *left-offset* is set to the negative of the value of "right". If neither "left" nor "right" is specified the *left-offset* is 0. If the "bottom" property is specified but "top" is not, then *top-offset* is set to the negative of the value of "bottom". If neither "top" nor "bottom" is specified the *top-offset* is 0.

### 5.5.6. Text-decoration Property

The "text-decoration" property value provides values for the *blink* trait and a set of score and score-color traits. The *specified color* has the value of the *color* trait of the formatting object for which the "text-decoration" property is being refined.

A property value containing the token "underline" sets a value of "true" to the *underline-score* trait, and a value of *specified color* to the *underline-score-color* trait.

A property value containing the token "overline" sets a value of "true" to the *overline-score* trait, and a value of *specified color* to the *overline-score-color* trait.

A property value containing the token "line-through" sets a value of "true" to the *through-score* trait, and a value of *specified color* to the *through-score-color* trait.

A property value containing the token "blink" sets a value of "true" to the *blink* trait.

A property value containing the token "no-underline" sets a value of "false" to the *underline-score* trait, and a value of *specified color* to the *underline-score-color* trait.

A property value containing the token "no-overline" sets a value of "false" to the *overline-score* trait, and a value of *specified color* to the *overline-score-color* trait.

A property value containing the token "no-line-through" sets a value of "false" to the *through-score* trait, and a value of *specified color* to the *through-score-color* trait.

A property value containing the token "no-blink" sets a value of "false" to the *blink* trait.

### 5.5.7. Font Properties

The font traits on an area are indirectly derived from the combination of the font properties, which are used to select a font, and the font tables from that font.

The abstract model that XSL assumes for a font is described in § 7.9.1 – [Fonts and Font Data](#) on page 268.

There is no XSL mechanism to specify a particular font; instead, a *selected font* is chosen from the fonts available to the User Agent based on a set of selection criteria. The *selection criteria* are the following font properties: "font-family", "font-style", "font-variant", "font-weight", "font-stretch", and "font-size", plus, for some formatting objects, one or more characters. The details of how the selection criteria are used is specified in the "font-selection-strategy" property (see § 7.9.3 – [“font-selection-strategy”](#) on page 272).

The *nominal-font* trait is set to the selected font. In the case where there is no selected font and the 'missing character' glyph is displayed, the *nominal-font* trait is set to the font containing that glyph, otherwise (i.e., some other mechanism was used to indicate that a character is not being displayed) the *nominal-font* is a system font.

The *dominant-baseline-identifier* and *actual-baseline-table* traits are derived from the value of the "dominant-baseline" property. The value of this property is a compound value with three components: a baseline-identifier for the dominant-baseline, a baseline-table and a baseline-table font-size. The *dominant-baseline-identifier* is set from the first component. The baseline-table font-size is used to scale the the positions of the baselines from the baseline table and, then, the position of the dominant-baseline is subtracted from the positions of the other baselines to yield a table of offsets from the dominant baseline. This table is the value of the *actual-baseline-table* trait.




## 5.6. Non-property Based Trait Generation

The *is-reference-area* trait is set to "true" for specific formatting objects. The description of these formatting objects specify explicitly that this is the case. For all other formatting objects it is set to "false".

## 5.7. Property Based Transformations

### 5.7.1. Text-transform Property

The case changes specified by this property are carried out during refinement by changing the value of the "character" property appropriately.

 The use of the "text-transform" property is deprecated in XSL due to its severe internationalization issues.

## 5.8. Unicode BIDI Processing

The characters in certain scripts are written horizontally from right to left. In some documents, in particular those written with the Arabic or Hebrew script, and in some mixed-language contexts, text in a single (visually displayed) block may appear with mixed directionality. This phenomenon is called bidirectionality, or "BIDI" for short.

The Unicode BIDI algorithm [[UNICODE UAX #9](#)] defines a complex algorithm for determining the proper directionality of text. The algorithm is based on both an implicit part based on character properties, as well as explicit controls for embeddings and overrides.

The final step of refinement uses this algorithm and the Unicode bidirectional character type of each character to convert the implicit directionality of the text into explicit markup in terms of formatting objects. For example, a sub-sequence of Arabic characters in an otherwise English paragraph would cause the creation of an inline formatting object with the Arabic characters as its content, with a "direction" property of "rtl" and a "unicode-bidi" property of "bidi-override". The formatting object makes explicit the previously implicit right to left positioning of the Arabic characters.

As defined in [[UNICODE UAX #9](#)], the Unicode BIDI algorithm takes a stream of text as input, and proceeds in three main phases:

1. Separation of the input text into paragraphs. The rest of the algorithm affects only the text between paragraph separators.
2. Resolution of the embedding levels of the text. In this phase, the bidirectional character types, plus the Unicode directional formatting codes, are used to produce *resolved embedding levels*. The normative bidirectional character type for each character is specified in the Unicode Character Database [[UNICODE Character Database](#)].
3. Reordering the text for display on a line-by-line basis using the resolved embedding levels, once the text has been broken into lines.

The algorithm, as described above, requires some adaptations to fit into the XSL processing model. First, the final, text reordering step is not done during refinement. Instead, the XSL equivalent of re-ordering is done during area tree generation. The *inline-progression-direction* of each glyph is used to control the stacking of glyphs as described in § 4.2.5 – [Stacking Constraints](#) on page 21. The *inline-progression-direction* is determined at the block level by the "writing-mode" property and within the inline formatting objects within a block by the "direction" and "unicode-bidi" properties that were either specified on

inline formatting objects generated by tree construction or are on inline formatting objects introduced by this step of refinement (details below).

Second, the algorithm is applied to a sequence of characters coming from the content of one or more formatting objects. The sequence of characters is created by processing a fragment of the formatting object tree. A *fragment* is any contiguous sequence of children of some formatting object in the tree. The sequence is created by doing a pre-order traversal of the fragment down to the fo:character level. During the pre-order traversal, every fo:character formatting object adds a character to the sequence. Furthermore, whenever the pre-order scan encounters a node with a "unicode-bidi" property with a value of "embed" or "bidi-override", add a Unicode RLO/LRO or RLE/LRE character to the sequence as appropriate to the value of the "direction" and "unicode-bidi" properties. On returning to that node after traversing its content, add a Unicode PDF character. In this way, the formatting object tree fragment is flattened into a sequence of characters. This sequence of characters is called the *flattened sequence of characters* below.

Third, in XSL the algorithm is applied to *delimited text ranges* instead of just paragraphs. A delimited text range is a maximal flattened sequence of characters that does not contain any delimiters. Any formatting object that generates block-areas is a delimiter. It acts as a delimiter for its content. It also acts as a delimiter for its parent's content. That is, if the parent has character content, then its children formatting objects that generate block-areas act to break that character content into *anonymous blocks* each of which is a delimited text range. In a similar manner, the fo:multi-case formatting object acts as delimiter for its content and the content of its parent. Finally, text with an orientation that is not perpendicular to the dominant-baseline acts as a delimiter to text with an orientation perpendicular to the dominant-baseline. We say that *text has an orientation perpendicular to the dominant-baseline* if the glyphs that correspond to the characters in the text are all oriented perpendicular to the dominant-baseline.



In most cases, a delimited text range is the maximal sequence of characters that would be formatted into a sequence of one or more line-areas. For the fo:multi-case and the text with an orientation perpendicular to the dominant-baseline, the delimited range may be a sub-sequence of a line or sequence of lines. For example, in Japanese formatted in a vertical writing-mode, rotated Latin and Arabic text would be delimited by the vertical Japanese characters that immediately surround the Latin and Arabic text. Any formatting objects that generated inline-areas would have no affect on the determination of the delimited text range.


For each delimited text range, the *inline-progression-direction* of the nearest ancestor (including self) formatting object that generates a block-area determines the *paragraph embedding level* used in the Unicode BIDI algorithm. This is the default embedding level for the delimited text range.

*Embedding levels* are numbers that indicate how deeply the text is nested, and the default direction of text on that level. The minimum embedding level of text is zero, and the maximum embedding level is level 61. Having more than 61 embedding levels is an error. An XSL processor may signal the error. If it does not signal the error, it must recover by allowing a higher maximum number of embedding levels.


The second step of the Unicode BIDI algorithm labels each character in the delimited text range with a *resolved embedding level*. The resolved embedding level of each character will be greater than or equal to the paragraph embedding level. Right-to-left text will always end up with an odd level, and left-to-right and numeric text will always end up with an even level. In addition, numeric text will always end up with a higher level than the paragraph level.

Once the resolved embedding levels are determined for the delimited text range, new fo:bidi-override formatting objects with appropriate values for the "direction" and "unicode-bidi" properties are inserted into the formatting object tree fragment that was flattened into the delimited text range such that the following constraints are satisfied:

1. For any character in the delimited text range, the *inline-progression-direction* of the character must match its resolved embedding level.
2. For each resolved embedding level  $L$  from the paragraph embedding level to the maximum resolved embedding level, and for each maximal contiguous sequence of characters  $S$  for which the resolved embedding level of each character is greater than or equal to  $L$ ,
  - A. There is an inline formatting object  $F$  which has as its content the formatting object tree fragment that flattens to  $S$  and has a "direction" property consistent with the resolved embedding level  $L$ .

  $F$  need not be an inserted formatting object if the constraint is met by an existing formatting object or by specifying values for the "direction" and "unicode-bidi" properties on an existing formatting object.

- B. All formatting objects that contain any part of the sequence  $S$  are properly nested in  $F$  and retain the nesting relationships they had in the formatting object tree prior to the insertion of the new formatting objects.

 Satisfying this constraint may require splitting one or more existing formatting objects in the formatting object tree each into a pair of formatting objects each of which has the same set of computed property values as the original, unsplit formatting object. One of the pair would be ended before the start of  $F$  or start after the end of  $F$  and the other would start after the start of  $F$  or would end before the end of  $F$ , respectively. The created pairs must continue to nest properly to satisfy this constraint. For example, assume Left-to-right text is represented by the character "L" and Right-to-left text is represented by "R". In the sub-tree

```
<fo:block>
  LL
  <fo:inline id="A" color="red">LLRRR</fo:inline>
  RR
</fo:block>
```

assuming a paragraph embedding level of "0", the resolved embedding levels would require the following (inserted and replicated) structure:


```
<fo:block>
  LL
  <fo:inline id="A" color="red">LLL</fo:inline>
  <fo:bidi-override direction="rtl">
    <fo:inline color="red">RRR</fo:inline>
  RR
</fo:bidi-override>
</fo:block>
```

Note that the fo:inline with id equal to "A" has been split into two fo:inlines, with only the first one retaining the original id of "A". Since id's must be unique within the formatting object tree, the computed value of any id must not be replicated in the second member of the pair.

3. No fewer fo:bidi-override formatting objects can be inserted and still satisfy the above constraints. That is, add to the refined formatting object tree only as many fo:bidi-override formatting objects, beyond the formatting objects created during tree construction, as are needed to represent the embedding levels present in the document.

## 5.9. Expressions


All property value specifications in attributes within an XSL stylesheet can be expressions. These expressions represent the value of the property specified. The expression is first evaluated and then the resultant value is used to determine the value of the property.

 The expression language supports operations on a limited set of datatypes. These do not include <angle>, <time>, and <frequency>. Values of these datatypes must be strings in the expression language. The definition of these datatypes specify the allowed form of these strings.

### 5.9.1. Property Context

Properties are evaluated against a property-specific context. This context provides:

- A list of allowed resultant types for a property value.
- Conversions from resultant expression value types to an allowed type for the property.
- The current font-size value.
- Conversions from relative numerics by type to absolute numerics within additive expressions.

 It is not necessary that a conversion be provided for all types. If no conversion is specified, it is an error.

When a type instance (e.g., a string, a keyword, a numeric, etc.) is recognized in the expression it is evaluated against the property context. This provides the ability for specific values to be converted with the property context's specific algorithms or conversions for use in the evaluation of the expression as a whole.

For example, the "auto" enumeration token for certain properties is a calculated value. Such a token would be converted into a specific type instance via an algorithm specified in the property definition. In such a case the resulting value might be an absolute length specifying the width of some aspect of the formatting object.

In addition, this allows certain types like relative numerics to be resolved into absolute numerics prior to mathematical operations.

All property contexts allow conversions as specified in § 5.9.12 – [Expression Value Conversions](#) on page 63.

### 5.9.2. Evaluation Order

When a set of properties is being evaluated for a specific formatting object in the formatting object tree there is a specific order in which properties must be evaluated. Essentially, the "font-size" property must be evaluated first before all other properties. Once the "font-size" property has been evaluated, all other properties may be evaluated in any order.

When the "font-size" property is evaluated, the current font-size for use in evaluation is the font-size of the parent element. Once the "font-size" property has been evaluated, that value is used as the current font-size for all property contexts of all properties value expressions being further evaluated.

### 5.9.3. Basics

[1] Expr ::= **AdditiveExpr**





When the final value of a property is calculated, the resulting power of the absolute numeric must be either zero or one. If any other power is specified, the value is an error.

### 5.9.7. Relative Numerics

Relative lengths are values that are calculated relative to some other set of values. When written as part of an expression, they are either converted via the property context into an absolute numeric or passed verbatim as the property value.

It is an error if the property context has no available conversion for the relative numeric and a conversion is required for expression evaluation (e.g., within an add operation).

#### 5.9.7.1. Percents

Percentages are values that are counted in 1/100 units. That is, 10% as a percentage value is 0.10 as a floating point number. When converting to an absolute numeric, the percentage is defined in the property definition as being a percentage of some known property value. If the percentage evaluates to "auto" the complete expression evaluates to "auto".

For example, a value of "110%" on a "font-size" property would be evaluated to mean 1.1 times the current font size. Such a definition of the allowed conversion for percentages is specified on the property definition. If no conversion is specified, the resulting value is a percentage.

#### 5.9.7.2. Relative Lengths

A relative length is a unit-based value that is measured against the current value of the `font-size` property.

There is only one relative unit of measure, the "em". The definition of "1em" is equal to the current font size. For example, a value of "1.25em" is 1.25 times the current font size.

When an em measurement is used in an expression, it is converted according to the font-size value of the current property's context. The result of the expression is an absolute length. See § 7.9.4 – “font-size” on page 273.

### 5.9.8. Strings

Strings are represented either as **literals** or as an **enumeration token**. All properties contexts allow conversion from enumeration tokens to strings. See § 5.9.12 – Expression Value Conversions on page 63.

### 5.9.9. Colors

A color is a set of values used to identify a particular color from a color space. Only RGB [**sRGB**] (Red, Green, Blue) and ICC (International Color Consortium) [**ICC**] colors are included in this Recommendation.


RGB colors are directly represented in the expression language using a hexadecimal notation. ICC colors can be specified through an `rgb-icc` function. Colors can also be specified through the `system-color` function or through conversion from an **EnumerationToken** via the property context.

### 5.9.10. Keywords

Keywords are special tokens in the grammar that provide access to calculated values or other property values. The allowed keywords are defined in the following subsections.

### 5.9.10.1. inherit

The property takes the same *computed* value as the property for the formatting object's parent object.

 "inherit" is not allowed as an expression mixed with operations. The same functionality is provided by the `from-parent()` function, which can be mixed with operations.

### 5.9.11. Lexical Structure

When processing an expression, white space (**ExprWhitespace**) may be allowed before or after any expression token even though it is not explicitly defined as such in the grammar. In some cases, white space is necessary to make tokens in the grammar lexically distinct. Essentially, white space should be treated as if it does not exist after tokenization of the expression has occurred.

The following special tokenization rules must be applied in the order specified to disambiguate the grammar:

- If the character following an **NCName** (possibly after intervening **ExprWhitespace**) is "(", then the token must be recognized as **FunctionName**.
- A number terminates at the first occurrence of a non-digit character other than ".". This allows the unit token for length quantities to parse properly.
- When an **NCName** immediately follows a **Number**, it should be recognized as a **UnitName** or it is an error.
- The **Keyword** values take precedence over **EnumerationToken**.
- If a **NCName** follows a **numeric**, it should be recognized as an **OperatorName** or it is an error.

#### Expression Lexical Structure

- ```
[14]      ExprToken ::= '(' | ')' | '%'
           | Operator
           | FunctionName
           | EnumerationToken
           | Number

[15]      Number ::= FloatingPointNumber

[16]      FloatingPointNumber ::= Digits ('.' Digits)?
           | '.' Digits

[17]      Digits ::= [0-9]+

[18]      Color ::= '#' AlphaOrDigits

[19]      AlphaOrDigits ::= [a-fA-F0-9]+

[20]      Literal ::= "" [^"]* ""
           | "" "" [^"]* ""

[21]      Operator ::= OperatorName
           | MultiplyOperator
           | '+' | '-'

[22]      OperatorName ::= 'mod' | 'div'

[23]      MultiplyOperator ::= '*'
```



- [24] Keyword ::= 'inherit'
- [25] FunctionName ::= [NCName](#)
- [26] EnumerationToken ::= [NCName](#)
- [27] AbsoluteUnitName ::= 'cm' | 'mm' | 'in' | 'pt' | 'pc' | 'px'
- [28] RelativeUnitName ::= 'em'
- [29] ExprWhitespace ::= [S](#)

### 5.9.12. Expression Value Conversions

Values that are the result of an expression evaluation may be converted into property value types. In some instances this is a simple verification of set membership (e.g., is the value a legal country code). In other cases, the value is expected to be a simple type like an integer and must be converted.

It is not necessary that all types be allowed to be converted. If the expression value cannot be converted to the necessary type for the property value, it is an error.

The following table indicates what conversions are allowed.

| Type                            | Allowed Conversions                                                                                                                                                                                    | Constraints                                                                               |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <a href="#">NCName</a>          | <ul style="list-style-type: none"> <li>Color, via the <code>system-color()</code> function.</li> <li>Enumeration value, as defined in the property definition.</li> <li>To a string literal</li> </ul> | The value may be checked against a legal set of values depending on the property.         |
| <a href="#">AbsoluteNumeric</a> | <ul style="list-style-type: none"> <li>Integer, via the <code>round()</code> function.</li> <li>Color, as an RGB color value.</li> </ul>                                                               | If converting to an RGB color value, it must be a legal color value from the color space. |
| <a href="#">RelativeLength</a>  | <ul style="list-style-type: none"> <li>To an <a href="#">AbsoluteLength</a></li> </ul>                                                                                                                 |                                                                                           |

The specific conversion to be applied is property specific and can be found in the definition of each property.



Conversions of compound property values are not allowed; thus for example, `space-before.optimum="inherited-property-value(space-before)"` is invalid. Permitted are, for example, `space-before="inherited-property-value(space-before)"` and `space-before.optimum="inherited-property-value(space-before.optimum)"` since they do not require conversion.

### 5.9.13. Definitions of Units of Measure

The units of measure in this Recommendation have the following definitions:

| Name | Definition                  |
|------|-----------------------------|
| cm   | See <a href="#">[ISO31]</a> |
| mm   | See <a href="#">[ISO31]</a> |
| in   | 2.54cm                      |
| pt   | 1/72in                      |
| pc   | 12pt                        |

|    |                                             |
|----|---------------------------------------------|
| px | See § 5.9.13.1 – Pixels on page 64          |
| em | See § 5.9.7.2 – Relative Lengths on page 61 |

### 5.9.13.1. Pixels

XSL interprets a 'px' unit to be a request for the formatter to choose a device-dependent measurement that approximates viewing one pixel on a typical computer monitor. This interpretation is follows:

1. The preferred definition of one 'px' is:
  - The actual distance covered by the largest integer number of device dots (the size of a device dot is measured as the distance between dot centers) that spans a distance less-than-or-equal-to the distance specified by the arc-span rule in <http://www.w3.org/TR/REC-CSS2//syndata.html#x39> or superceding errata.
  - A minimum of the size of 1 device dot should be used.
  - This calculation is done separately in each axis, and may have a different value in each axis.
2. However, implementors may instead simply pick a fixed conversion factor, treating 'px' as an absolute unit of measurement (such as 1/92" or 1/72").



Pixels should not be mixed with other absolute units in expressions as they may cause undesirable effects. Also, particular caution should be used with inherited property values that may have been specified using pixels.

If the User Agent chooses a measurement for a 'px' that does not match an integer number of device dots in each axis it may produce undesirable effects, such as:

- moiré patterns in scaled raster graphics
- unrenderable overlapping areas when the renderer rounds fonts or graphics sizes upward to its actual dot-size
- large spaces between areas when the renderer rounds fonts or graphics sizes downward to its actual dot-size
- unreadable results including unacceptably small text/layout (for example, a layout was calculated at 72 dpi [dots per inch], but the renderer assumed the result was already specified in device dots and rendered it at 600 dpi).

Stylesheet authors should understand a pixel's actual size may vary from device to device:

- stylesheets utilizing 'px' units may not produce consistent results across different implementations or different output devices from a single implementation
- even if stylesheets are expressed entirely in 'px' units the results may vary on different devices

## 5.10. Core Function Library

### 5.10.1. Number Functions

**Function:** *numeric floor(numeric)*

The **floor** function returns the largest (closest to positive infinity) integer that is not greater than the argument. The numeric argument to this function must be of unit power zero.



If it is necessary to use the **floor** function for a property where a unit power of one is expected, then an expression such as: "floor(1.4in div 1.0in)\*1.0in" must be used. This also applies to the ceiling, round, and other such functions where a unit power of zero is required.

---

**Function:** *numeric ceiling(numeric)*

The **ceiling** function returns the smallest (closest to negative infinity) integer that is not less than the argument. The numeric argument to this function must be of unit power zero.

**Function:** *numeric round(numeric)*

The **round** function returns the integer that is closest to the argument. If there are two such numbers, then the one that is closest to positive infinity is returned. The numeric argument to this function must be of unit power zero.

**Function:** *numeric min(numeric, numeric)*

The **min** function returns the minimum of the two numeric arguments. These arguments must have the same unit power.

**Function:** *numeric max(numeric, numeric)*

The **max** function returns the maximum of the two numeric arguments. These arguments must have the same unit power.

**Function:** *numeric abs(numeric)*

The **abs** function returns the absolute value of the numeric argument. That is, if the numeric argument is negative, it returns the negation of the argument.

### 5.10.2. Color Functions

**Function:** *color rgb(numeric, numeric, numeric)*

The **rgb** function returns a specific color from the RGB color space. The parameters to this function must be numerics (real numbers) with a length power of zero.

**Function:** *color rgb-icc(numeric, numeric, numeric, NCName, numeric, numeric)*

The **rgb-icc** function returns a specific color from the ICC Color Profile. The color profile is specified by the name parameter (the fourth parameter). This color profile must have been declared in the fo:declarations formatting object using an fo:color-profile formatting object.

The first three parameters specify a fallback color from the sRGB color space. This color is used when the color profile is not available.

The color is specified by a sequence of one or more color values (real numbers) specified after the name parameter. These values are specific to the color profile.

**Function:** *color system-color(NCName)*

The **system-color** function returns a system defined color with a given name.

### 5.10.3. Font Functions

**Function:** *object system-font(NCName, NCName?)*

The **system-font** function returns a characteristic of a system font. The first argument is the name of the system font and the second argument, which is optional, names the property that specifies the characteristic. If the second argument is omitted, then the characteristic returned is the same as the name of the property to which the expression is being assigned.

For example, the expression "system-font(heading,font-size)" returns the font-size characteristic for the system font named "heading". This is equivalent to the property assignment 'font-size="system-font(heading)"'.

#### 5.10.4. Property Value Functions

**Function:** *object inherited-property-value(NCName?)*

The **inherited-property-value** function returns the inherited value of the property whose name matches the argument specified, or if omitted for the property for which the expression is being evaluated. It is an error if this property is not an inherited property. If the argument specifies a shorthand property and if the expression only consists of the inherited-property-value function with an argument matching the property being computed, it is interpreted as an expansion of the shorthand with each property into which the shorthand expands, each having a value of inherited-property-value with an argument matching the property. It is an error if arguments matching a shorthand property are used in any other way. Similarly, if the argument specifies a property of a compound datatype and if the expression only consists of the inherited-property-value function with an argument matching the property being computed, it is interpreted as an expansion with each component of the compound property having a value of inherited-property-value with an argument matching the component. It is an error if arguments matching a property of a compound datatype are used in any other way.

The returned "inherited value" is the computed value of this property on this object's parent. For example, given the following:

```
<fo:list-block>
...
<fo:list-item color="red">
  <fo:list-item-body background-color="green">
    <fo:block background-color="inherited-property-value(color)">
      </fo:block>
    </fo:list-item-body>
  </fo:list-item>
</fo:list-block>
```

The background-color property on the fo:block is assigned the value "red" because the (computed, after inheritance) value of the color (not background-color) property on the fo:list-item-body that is the parent of the fo:block is "red".

**Function:** *numeric label-end()*

The **label-end** function returns the calculated label-end value for lists. See the definition in § 7.30.11 – “provisional-label-separation” on page 411.

**Function:** *numeric body-start()*

The **body-start** function returns the calculated body-start value for lists. See the definition in § 7.30.12 – “provisional-distance-between-starts” on page 411.

**Function:** *object from-parent(NCName?)*

The **from-parent** function returns a computed value (see § 5.1 – Specified, Computed, and Actual Values, and Inheritance on page 45) of the property whose name matches the argument specified, or if omitted for the property for which the expression is being evaluated. The value returned is that for the parent of the formatting object for which the expression is evaluated. If there is no parent, the value returned is the

initial value. If the argument specifies a shorthand property and if the expression only consists of the from-parent function with an argument matching the property being computed, it is interpreted as an expansion of the shorthand with each property into which the shorthand expands, each having a value of from-parent with an argument matching the property. It is an error if arguments matching a shorthand property are used in any other way. Similarly, if the argument specifies a property of a compound datatype and if the expression only consists of the from-parent function with an argument matching the property being computed, it is interpreted as an expansion with each component of the compound property having a value of from-parent with an argument matching the component. It is an error if arguments matching a property of a compound datatype are used in any other way.

**Function:** *object from-nearest-specified-value*(NCName?)

The **from-nearest-specified-value** function returns a computed value of the property whose name matches the argument specified, or if omitted for the property for which the expression is being evaluated. The value returned is that for the closest ancestor of the formatting object for which the expression is evaluated on which there is an assignment of the property in the XML result tree in the fo namespace. If there is no such ancestor, the value returned is the initial value. If the argument specifies a shorthand property and if the expression only consists of the from-nearest-specified-value function with an argument matching the property being computed, it is interpreted as an expansion of the shorthand with each property into which the shorthand expands, each having a value of from-nearest-specified-value with an argument matching the property. It is an error if arguments matching a shorthand property are used in any other way. Similarly, if the argument specifies a property of a compound datatype and if the expression only consists of the from-nearest-specified-value function with an argument matching the property being computed, it is interpreted as an expansion with each component of the compound property having a value of from-nearest-specified-value with an argument matching the component. It is an error if arguments matching a property of a compound datatype are used in any other way.

**Function:** *object from-page-master-region*(NCName?)

The **from-page-master-region** function returns the computed value of the property whose name matches the argument specified, or if omitted for the property for which the expression is being evaluated.

In XSL 1.1 this function may only be used as the value of the "writing-mode" and "reference-orientation" properties. In addition the argument of the function *must* be omitted. If an argument is present, it is an error.

The computed value of the designated property is taken from that property on the layout formatting object being used to generate the region viewport/reference area pair.

If this function is used in an expression on a formatting object, *F*, that is a descendant of an fo:page-sequence, then the computed value is taken from the region specification that was used to generate the nearest ancestor region reference area which has as its descendants the areas returned by *F*.

If the argument specifies a property of a compound datatype and if the expression only consists of the inherited-property-value function with an argument matching the property being computed, it is interpreted as an expansion with each component of the compound property having a value of inherited-property-value with an argument matching the component. It is an error if arguments matching a property of a compound datatype are used in any other way.



Consider the following example:

```
<fo:root>
```

```
<fo:layout-master-set>
```

```

<fo:simple-page-master master-name="all-pages">
  <fo:region-body region-name="xsl-region-body" margin="0.75in"
    writing-mode="tb-rl" />
  <fo:region-before region-name="xsl-region-before" extent="0.75in"/>
</fo:simple-page-master>
<fo:page-sequence-master master-name="default-sequence">
  <fo:repeatable-page-master-reference master-reference="all-pages"/>
</fo:page-sequence-master>
</fo:layout-master-set>

<fo:page-sequence master-name="default-sequence">
  <fo:flow flow-name="xsl-region-body">
    <fo:block>
      [Content in a language which allows either
        horizontal or vertical formatting]
    </fo:block>
  </fo:flow>
</fo:page-sequence>

</fo:root>

```

This example shows a very simple page layout specification. There is a single simple-page-master, named "all-pages". This page-master has two regions defined upon it, "xsl-region-body" and "xsl-region-before". The region named "xsl-region-before" is a page header that accepts static-content (said content is omitted for simplicity in this example). The region named "xsl-region-body" is assigned the content of the single fo:flow in the single fo:page-sequence.

In this example, the definition of "xsl-region-body" has a "writing-mode" property. As written, the computed value of this property, "tb-rl", would have no effect on the writing-mode used to fill the region because the writing-mode value used when generating the region viewport/reference area pair would be the computed value on the fo:page-sequence that uses the "xsl-region-body" region definition to generate a region viewport/reference area pair. Since no "writing-mode" property is specified on either the fo:root nor its child, the fo:page-sequence, the initial value would be used for the writing mode for the content that fills the region reference area. The initial value of "writing-mode" is "lr-tb".

If, however, the above line that reads:

```
<fo:page-sequence master-name="default-sequence">
```

becomes

```
<fo:page-sequence master-name="default-sequence"
  writing-mode="from-page-master-region()">
```

then the computed value of the "writing-mode" property on the region definitions would be used when instantiating all the viewport/reference area pairs. Thus for the xsl-region-body the specification on the region definition for "xsl-region-body" would be used and the content would receive vertical formatting instead of the default horizontal formatting. Similarly for the xsl-region-before, the computed value of the "writing-mode" on the region definition would be used, in this case the initial value of "lr-tb" inherited from fo:root and the content of the xsl-region-before would be formatted horizontally.

### **Function:** *object from-table-column*(NCName?)

The **from-table-column** function returns the inherited value of the property whose name matches the argument specified, or if omitted for the property for which the expression is being evaluated, from the fo:table-column whose column-number matches the column for which this expression is evaluated and whose number-columns-spanned also matches any span. If there is no match for the number-columns-


spanned, it is matched against a span of 1. If there is still no match, the initial value is returned. If the argument specifies a shorthand property and if the expression only consists of the `from-table-column` function with an argument matching the property being computed, it is interpreted as an expansion of the shorthand with each property into which the shorthand expands, each having a value of `from-table-column` with an argument matching the property. It is an error if arguments matching a shorthand property are used in any other way. Similarly, if the argument specifies a property of a compound datatype and if the expression only consists of the `from-table-column` function with an argument matching the property being computed, it is interpreted as an expansion with each component of the compound property having a value of `from-table-column` with an argument matching the component. It is an error if arguments matching a property of a compound datatype are used in any other way. It is also an error to use this function on formatting objects that are not an `fo:table-cell` or its descendants.

**Function:** *numeric proportional-column-width*(*numeric*)

The **proportional-column-width** function returns  $N$  units of proportional measure where  $N$  is the argument given to this function. The column widths are first determined ignoring the proportional measures. The difference between the table-width and the sum of the column widths is the available proportional width. One unit of proportional measure is the available proportional width divided by the sum of the proportional factors. It is an error to use this function on formatting objects other than an `fo:table-column`. It is also an error to use this function if the fixed table layout is not used.

**Function:** *object merge-property-values*(*NCName?*)

The **merge-property-values** function returns a value of the property whose name matches the argument, or if omitted for the property for which the expression is being evaluated. The value returned is the specified value on the last `fo:multi-property-set`, of the parent `fo:multi-properties`, that applies to the User Agent state. If there is no such value, the computed value of the parent `fo:multi-properties` is returned. If the argument specifies a shorthand property and if the expression only consists of the `merge-property-values` function with an argument matching the property being computed, it is interpreted as an expansion of the shorthand with each property into which the shorthand expands, each having a value of `merge-property-values` with an argument matching the property. It is an error if arguments matching a shorthand property are used in any other way. Similarly, if the argument specifies a property of a compound datatype and if the expression only consists of the `merge-property-values` function with an argument matching the property being computed, it is interpreted as an expansion with each component of the compound property having a value of `merge-property-values` with an argument matching the component. It is an error if arguments matching a property of a compound datatype are used in any other way.

 The test for applicability of a User Agent state is specified using the "active-state" property.

It is an error to use this function on formatting objects other than an `fo:wrapper` that is the child of an `fo:multi-properties`.

## 5.11. Property Datatypes

Certain property values are described in terms of compound datatypes, in terms of restrictions on permitted number values, or strings with particular semantics.

The compound datatypes, such as `space`, are represented in the result tree as multiple attributes. The names of these attributes consist of the property name, followed by a period, followed by the component name. For example a "space-before" property may be specified as:


```
space-before.minimum="2.0pt"
space-before.optimum="3.0pt"
space-before.maximum="4.0pt"
space-before.precedence="0"
space-before.conditionality="discard"
```

A short form of compound value specification may be used, in cases where the datatype has some <length> components and for the <keep> datatype. In the first case the specification consists of giving a <length> value to an attribute with a name matching a property name. Such a specification gives that value to each of the <length> components and the initial value to all the non-<length> components. For example:

```
space-before="4.0pt"
```

is equivalent to a specification of

```
space-before.minimum="4.0pt"
space-before.optimum="4.0pt"
space-before.maximum="4.0pt"
space-before.precedence="0"
space-before.conditionality="discard"
```

 Since a <percentage> value, that is not interpreted as "auto", is a valid <length> value it may be used in a short form.

For the <keep> datatype the specification consists of giving a value that is valid for a component to an attribute with a name matching a property name. Such a specification gives that value to each of the components. For example:

```
keep-together="always"
```

is equivalent to a specification of

```
keep-together.within-line="always"
keep-together.within-column="always"
keep-together.within-page="always"
```

Short forms may be used together with complete forms; the complete forms have precedence over the expansion of a short form. For example:

```
space-before="4.0pt"
space-before.maximum="6.0pt"
```


is equivalent to a specification of

```
space-before.minimum="4.0pt"
space-before.optimum="4.0pt"
space-before.maximum="6.0pt"
space-before.precedence="0"
space-before.conditionality="discard"
```

Compound values of properties are inherited as a unit and not as individual components. After inheritance any complete form specification for a component is used to set its value.



If the computed value of a corresponding relative property is set from the corresponding absolute property, the latter is used in determining all the components of the former.

 For example, assuming a block-progression-direction of "top-to-bottom", in a specification of


```
margin-top="10.0pt"
space-before.minimum="4.0pt"
```

the explicit setting of one of the components of the corresponding relative property will have no effect.

The following defines the syntax for specifying the datatypes usable in property values:

### **<integer>**

A signed integer value which consists of an optional '+' or '-' character followed by a sequence of digits. A property may define additional constraints on the value.

 A '+' sign is allowed for CSS2 compatibility.

### **<number>**

A signed real number which consists of an optional '+' or '-' character followed by a sequence of digits followed by an optional '.' character and sequence of digits. A property may define additional constraints on the value.

### **<length>**

A signed length value where a 'length' is a real number plus a unit qualification. A property may define additional constraints on the value.

### **<length-range>**

A compound datatype, with components: minimum, optimum, maximum. Each component is a <length>. If "minimum" is greater than optimum, it will be treated as if it had been set to "optimum". If "maximum" is less than optimum, it will be treated as if it had been set to "optimum". A property may define additional constraints on the values, and additional permitted values and their semantics; e.g. 'auto' or <percentage>.

### **<length-conditional>**

A compound datatype, with components: length, conditionality. The length component is a <length>. The conditionality component is either "discard" or "retain". A property may define additional constraints on the values.

### **<length-bp-ip-direction>**

A compound datatype, with components: block-progression-direction, and inline-progression-direction. Each component is a <length>. A property may define additional constraints on the values.

### **<space>**

A compound datatype, with components: minimum, optimum, maximum, precedence, and conditionality. The minimum, optimum, and maximum components are <length>s. The precedence component is either "force" or an <integer>. The conditionality component is either "discard" or "retain". If "minimum" is greater than optimum, it will be treated as if it had been set to "optimum". If "maximum" is less than optimum, it will be treated as if it had been set to "optimum".

**<keep>**

A compound datatype, with components: within-line, within-column, and within-page. The value of each component is either "auto", "always", or an <integer>.

**<angle>**

A representation of an angle consisting of an optional '+' or '-' character immediately followed by a <number> immediately followed by an angle unit identifier. Angle unit identifiers are: 'deg' (for degrees), 'grad' (for grads), and 'rad' (for radians). The specified values are normalized to the range 0deg to 360deg. A property may define additional constraints on the value.

**<percentage>**

A signed real percentage which consists of an optional '+' or '-' character followed by a sequence of digits followed by an optional '.' character and sequence of digits followed by '%'. A property may define additional constraints on the value.

**<character>**

A single Unicode character valid in accordance with production [2] of [XML] or [XML 1.1]. For example, "c" or "&#x2202;".

**<string>**

A sequence of characters.



Given the allowable Expression Value Conversions (§ 5.9.12 – Expression Value Conversions on page 63), a property value of type <string> must be a quoted value, an NCName, or an expression that evaluates to a <string>; anything else (e.g., an integer) is an error. An implementation may recover from this error by treating the unevaluated property value as a string.

**<name>**

A string of characters representing a name. It must conform to the definition of an [NCName](#) in [XML Names] or [XML Names 1.1].

**<family-name>**

A string of characters identifying a font.

**<color>**

Either a string of characters representing a keyword or a color function defined in § 5.10.2 – [Color Functions](#) on page 65. The list of keyword color names is: aqua, black, blue, fuchsia, gray, green, lime, maroon, navy, olive, purple, red, silver, teal, white, and yellow.

**<country>**

A string of characters conforming to an ISO 3166 ([ISO3166-1], [ISO3166-2], and [ISO3166-3]) country code.

**<language>**

A string of characters conforming to either a [ISO639-2] 3-letter terminology or bibliographic code or a [ISO639] 2-letter code representing the name of a language.

**<script>**

A string of characters conforming to an ISO 15924 script code.

**<id>**

A string of characters conforming to the definition of an [NCName](#) in [XML Names] or [XML Names 1.1] and is unique within the stylesheet.

**<idref>**

A string of characters conforming to the definition of an [NCName](#) in [XML Names] or [XML Names 1.1] and that matches an ID property value used within the stylesheet.

**<uri-specification>**

A sequence of characters that is "url(", followed by optional white space, followed by an optional single quote (') or double quote (") character, followed by an IRI reference as defined in [RFC3987], followed by an optional single quote (') or double quote (") character, followed by optional white space, followed by ")". The two quote characters must be the same and must both be present or absent. If the IRI reference contains a single quote, the two quote characters must be present and be double quotes.



The definition differs from that in CSS2 in that this Recommendation allows IRIs whereas CSS2 only allows URIs.

**<shape>**

"rect (" <top> <right> <bottom> <left> ")" where <top>, <bottom> <right>, and <left> specify offsets from the respective sides of the content rectangle of the area.

<top>, <right>, <bottom>, and <left> may either have a <length> value or 'auto'. Negative lengths are permitted. The value 'auto' means that a given edge of the clipping region will be the same as the edge of the content rectangle of the area (i.e., 'auto' means the same as '0pt'.)

**<time>**

A <number> immediately followed by a time unit identifier. Time unit identifiers are: 'ms' (for milliseconds) and 's' (for seconds).

**<frequency>**

A <number> immediately followed by a frequency unit identifier. Frequency unit identifiers are: 'Hz' (for Hertz) and 'kHz' (for kilo Hertz).

## 6. Formatting Objects

### 6.1. Introduction to Formatting Objects

The refined formatting object tree describes one or more intended presentations of the information within this tree. Formatting is the process which converts the description into a presentation. See § 3 – [Introduction to Formatting](#) on page 12. The presentation is represented, abstractly, by an area tree, as defined in the area model. See § 4 – [Area Model](#) on page 15. Each possible presentation is represented by one or more area trees in which the information in the refined formatting object tree is positioned on a two and one-half dimensional surface.

There are three kinds of formatting objects: (1) those that generate areas, (2) those that return areas, but do not generate them, and (3) those that are used in the generation of areas. The first and second kinds are typically called *flow objects*. The third kind is either a *layout object* or an *auxiliary object*. The kind of formatting object is indicated by the terminology used with the object. Formatting objects of the first

kind are said to "generate one or more areas". Formatting objects of the second kind are said to "return one or more areas". Formatting objects of the first kind may both generate and return areas. Formatting objects of the third kind are "used in the generation of areas"; that is, they act like parameters to the generation process.

### 6.1.1. Definitions Common to Many Formatting Objects

This categorization leads to defining two traits which characterize the relationship between an area and the formatting objects which generate and return that area. These traits are *generated-by* and *returned-by*.

The value of the *generated-by* trait is a single formatting object. A formatting object  $F$  is defined to *generate* an area  $A$  if the semantics of  $F$  specify the generation of one or more areas and  $A$  is one of the areas thus generated, or is a substituted form of one of the areas thus generated, as specified in section § 4.7.2 – [Line-building](#) on page 38.

In the case of substituted glyph-areas, the generating formatting object is deemed to be the formatting object which generated the glyph-area which comes first in the sequence of substituted glyph-areas. In the case of an inserted glyph-area (e.g., an automatically-generated hyphen) the generating formatting object is deemed to be the generating formatting object of the last glyph-area preceding the inserted glyph-area in the pre-order traversal of the area tree.

The value of the *returned-by* trait is a set of pairs, where each pair consists of a formatting object and a positive integer. The integer represents the position of the area in the ordering of all areas returned by the formatting object.

A formatting object  $F$  is defined to *return the sequence of areas*  $A, B, C, \dots$  if the pair  $(F,1)$  is a member of the *returned-by* trait of  $A$ , the pair  $(F,2)$  is a member of the *returned-by* trait of  $B$ , the pair  $(F,3)$  is a member of the *returned-by* trait of  $C$ , ...

If an area is a member of the sequence of areas returned by a formatting object, then either it was generated by the formatting object or it was a member of the sequence of areas returned by a child of that formatting object. Not all areas returned by a child of a formatting object need be returned by that formatting object. A formatting object may generate an area that has, as some of its children areas, areas returned by the children of that formatting object. These children (in the area tree) of the generated area are not returned by the formatting object to which they were returned.

A set of nodes in a tree is a *lineage* if:

- there is a node  $N$  in the set such that all the nodes in the set are ancestors of  $N$ , and
- for every node  $N$  in the set, if the set contains an ancestor of  $N$ , it also contains the parent of  $N$ .

The set of formatting objects that an area is returned by is a *lineage*.

Areas returned by a formatting object may be either *normal* or *out-of-line*. Normal areas represent areas in the "normal flow of text"; that is, they become area children of the areas generated by the formatting object to which they are returned. Normal areas have a *returned-by* lineage of size one. There is only one kind of normal area.

Out-of-line areas are areas used outside the normal flow of text either because they are absolutely positioned or they are part of a float or footnote. Out-of-line areas may have a *returned-by* lineage of size greater than one.

The *area-class* trait indicates which class, normal or out-of-line, an area belongs to. For out-of-line areas, it also indicates the subclass of out-of-line area. The values for this trait are: "xsl-normal", "xsl-absolute", "xsl-footnote", "xsl-side-float", or "xsl-before-float". An area is normal if and only if the value of the

*area-class* trait is "xsl-normal"; otherwise, the area is an out-of-line area. (See section § 4.2.5 – [Stacking Constraints](#) on page 21.)

The areas *returned-by* a given formatting object are ordered as noted above. This ordering defines an ordering on the sub-sequence of areas that are of a given *area-class*, such as the sub-sequence of normal areas. An area *A* precedes an area *B* in the sub-sequence if and only if area *A* precedes area *B* in the areas *returned-by* the formatting objects.

A *reference-area chain* is defined as a sequence of reference-areas that is either generated by the same formatting object that is not a page-sequence formatting object, or that consists of the region reference-areas or normal-flow-reference-areas (see § 6.4.14 – [fo:region-body](#) on page 102) generated using region formatting objects assigned to the same flow (see § 6.4.1.4 – [Flows and Flow Mapping](#) on page 84). The reference-areas in the sequence are said to be "contained" by the reference-area chain, and they have the same ordering relative to each other in the sequence as they have in the area tree, using pre-order traversal order of the area tree.

## 6.2. Formatting Object Content

The content of a formatting object is described using XML content-model syntax. In some cases additional constraints, not expressible in XML content models, are given in prose.

The parameter entity, "%block;" in the content models below, contains the following formatting objects:

```
block
block-container
table-and-caption
table
list-block
```

The parameter entity, "%inline;" in the content models below, contains the following formatting objects:

```
bidi-override
character
external-graphic
instream-foreign-object
inline
inline-container
leader
page-number
page-number-citation
page-number-citation-last
scaling-value-citation
basic-link
multi-toggle
index-page-citation-list
```

The following formatting objects are "neutral" containers and may be used, provided that the additional constraints listed under each formatting object are satisfied, anywhere where #PCDATA, %block;, or %inline; are allowed:

---

```
multi-switch
multi-properties
index-range-begin
index-range-end
wrapper
retrieve-marker
```

The following formatting objects are "neutral" containers that may be used as described by the constraints listed under each formatting object:

```
retrieve-table-marker
```

The following formatting objects define "points" and may be used anywhere as a descendant of fo:flow or fo:static-content:

```
change-bar-begin
change-bar-end
```

The following "out-of-line" formatting objects may be used anywhere where #PCDATA, %block;, or %inline; are allowed (except as a descendant of any "out-of-line" formatting object):

```
float
```

The following "out-of-line" formatting objects may be used anywhere where #PCDATA or %inline; are allowed (except as a descendant of any "out-of-line" formatting object):

```
footnote
```

## 6.3. Formatting Objects Summary

### *basic-link*

The fo:basic-link is used for representing the start resource of a simple link.

### *bidi-override*

The fo:bidi-override inline formatting object is used where it is necessary to override the default Unicode-bidirectional-algorithm direction for different (or nested) inline scripts in mixed-language documents.

### *block*

The fo:block formatting object is commonly used for formatting paragraphs, titles, headlines, figure and table captions, etc.

### *block-container*

The fo:block-container flow object is used to generate a block-level reference-area.

### *bookmark*

The fo:bookmark formatting object is used to identify an access point, by name, and to specify where that access point is within the current document or another external document. A given bookmark may be further subdivided into a sequence of (sub-)bookmarks to as many levels as the authors desire.

***bookmark-title***

The fo:bookmark-title formatting object is used to identify, in human readable form, an access point.

***bookmark-tree***

The fo:bookmark-tree formatting object is used to hold a list of access points within the document such as a table of contents, a list of figures or tables, etc. Each access point is represented by a bookmark.

***change-bar-begin***

The fo:change-bar-begin is used to indicate the beginning of a "change region" that is ended by its matching fo:change-bar-end. The change region is decorated with a change bar down either the start or end edge of the column. The style of the change bar is determined by the value of various change bar related properties.

***change-bar-end***

The fo:change-bar-end is used to indicate the end of a "change region" that is started by its matching fo:change-bar-begin.

***character***

The fo:character flow object represents a character that is mapped to a glyph for presentation.

***color-profile***

Used to declare a color profile for a stylesheet.

***conditional-page-master-reference***

The fo:conditional-page-master-reference is used to identify a page-master that is to be used when the conditions on its use are satisfied.

***declarations***

Used to group global declarations for a stylesheet.

***external-graphic***

The fo:external-graphic flow object is used for a graphic where the graphics data resides outside of the XML result tree in the fo namespace.

***float***

The fo:float serves two purposes. It can be used so that during the normal placement of content, some related content is formatted into a separate area at beginning of the page (or of some following page) where it is available to be read without immediately intruding on the reader. Alternatively, it can be used when an area is intended to float to one side, with normal content flowing alongside.

***flow***

The content of the fo:flow formatting object is a sequence of flow objects that provides the flowing text content that is distributed into pages.

***flow-assignment***

The fo:flow-assignment is used to specify the assignment of one sequence of flows to a sequence of regions.

***flow-map***

The fo:flow-map is used to specify the assignment of flows to regions.

***flow-name-specifier***

The fo:flow-name-specifier is used to specify one flow in a source-list.

***flow-source-list***

The fo:flow-source-list is used to specify the sequence of flows to assign in a particular fo:flow-assignment.

***flow-target-list***

The fo:flow-target-list is used to specify the sequence of regions to which flows are assigned in a particular fo:flow-assignment.

***folio-prefix***

The fo:folio-prefix formatting object specifies a static prefix for the folio numbers within a page-sequence.

***folio-suffix***

The fo:folio-suffix formatting object specifies a static suffix for the folio numbers within a page-sequence.

***footnote***

The fo:footnote is used to produce a footnote citation and the corresponding footnote.

***footnote-body***

The fo:footnote-body is used to generate the content of the footnote.

***index-key-reference***

The fo:index-key-reference formatting object is used to generate a set of cited page items for all the occurrences of the specified index-key.

***index-page-citation-list***

The fo:index-page-citation-list formatting object is used to group together the sets of cited page items generated by its fo:index-key-reference children. The ultimate effect of the fo:index-page-citation-list is to generate a formatted list of page numbers and ranges.

***index-page-citation-list-separator***

The fo:index-page-citation-list-separator formatting object specifies the formatting objects used to separate singleton page numbers or page number ranges in the generated list of page numbers.

***index-page-citation-range-separator***

The fo:index-page-citation-range-separator formatting object specifies the formatting objects used to separate two page numbers forming a range in the generated list of page numbers.

***index-page-number-prefix***

The fo:index-page-number-prefix formatting object specifies a static prefix for the cited page items created by fo:index-key-reference.

***index-page-number-suffix***

The fo:index-page-number-suffix formatting object specifies a static suffix for the cited page items created by fo:index-key-reference.



***index-range-begin***

The fo:index-range-begin formatting object is used to indicate the beginning of an "indexed range" associated with an index key. The index range is ended by a corresponding fo:index-range-end.

***index-range-end***

The fo:index-range-end is used to indicate the end of an "indexed range" that is started by its matching fo:index-range-begin.

***initial-property-set***

The fo:initial-property-set specifies formatting properties for the first line of an fo:block.

***inline***

The fo:inline formatting object is commonly used for formatting a portion of text with a background or enclosing it in a border.

***inline-container***

The fo:inline-container flow object is used to generate an inline reference-area.

***instream-foreign-object***

The fo:instream-foreign-object flow object is used for an inline graphic or other "generic" object where the object data resides as descendants of the fo:instream-foreign-object.

***layout-master-set***

The fo:layout-master-set is a wrapper around all masters used in the document.

***leader***

The fo:leader formatting object is used to generate leaders consisting either of a rule or of a row of a repeating character or cyclically repeating pattern of characters that may be used for connecting two text formatting objects.

***list-block***

The fo:list-block flow object is used to format a list.

***list-item***

The fo:list-item formatting object contains the label and the body of an item in a list.

***list-item-body***

The fo:list-item-body formatting object contains the content of the body of a list-item.

***list-item-label***

The fo:list-item-label formatting object contains the content of the label of a list-item; typically used to either enumerate, identify, or adorn the list-item's body.

***marker***

The fo:marker is used in conjunction with fo:retrieve-marker or fo:retrieve-table-marker to produce running headers or footers.

***multi-case***

The fo:multi-case is used to contain (within an fo:multi-switch) each alternative sub-tree of formatting objects among which the parent fo:multi-switch will choose one to show and will hide the rest.

***multi-properties***

The fo:multi-properties is used to switch between two or more property sets that are associated with a given portion of content.

***multi-property-set***

The fo:multi-property-set is used to specify an alternative set of formatting properties that, dependent on a User Agent state, are applied to the content.

***multi-switch***

The fo:multi-switch wraps the specification of alternative sub-trees of formatting objects (each sub-tree being within an fo:multi-case), and controls the switching (activated via fo:multi-toggle) from one alternative to another.

***multi-toggle***

The fo:multi-toggle is used within an fo:multi-case to switch to another fo:multi-case.

***page-number***

The fo:page-number formatting object is used to represent the current page-number.

***page-number-citation***

The fo:page-number-citation is used to reference the page-number for the page containing the first normal area returned by the cited formatting object.

***page-number-citation-last***

The fo:page-number-citation-last is used to reference the page-number for the last page containing the an area that is (a) returned by the cited formatting object and (b) has an area-class that is consistent with the specified page-citation-strategy.

***page-sequence***

The fo:page-sequence formatting object is used to specify how to create a (sub-)sequence of pages within a document; for example, a chapter of a report. The content of these pages comes from flow children of the fo:page-sequence.

***page-sequence-master***

The fo:page-sequence-master specifies sequences of page-masters that are used when generating a sequence of pages.

***page-sequence-wrapper***

The fo:page-sequence-wrapper formatting object is used to specify inherited properties for a group of fo:page-sequence formatting objects. It has no additional formatting semantics.

***region-after***

This region defines a viewport that is located on the "after" side of fo:region-body region.

***region-before***

This region defines a viewport that is located on the "before" side of fo:region-body region.

***region-body***

This region specifies a viewport/reference pair that is located in the "center" of the fo:simple-page-master.

***region-end***

This region defines a viewport that is located on the "end" side of fo:region-body region.

***region-name-specifier***

The fo:region-name-specifier is used to specify one region in a target-list.

***region-start***

This region defines a viewport that is located on the "start" side of fo:region-body region.

***repeatable-page-master-alternatives***

An fo:repeatable-page-master-alternatives specifies a sub-sequence consisting of repeated instances of a set of alternative page-masters. The number of repetitions may be bounded or potentially unbounded.

***repeatable-page-master-reference***

An fo:repeatable-page-master-reference specifies a sub-sequence consisting of repeated instances of a single page-master. The number of repetitions may be bounded or potentially unbounded.

***retrieve-marker***

The fo:retrieve-marker is used in conjunction with fo:marker to produce running headers or footers.

***retrieve-table-marker***

The fo:retrieve-table-marker is used in conjunction with fo:marker to produce table-headers and table-footers whose content can change over different pages, different regions or different columns.

***root***

The fo:root node is the top node of an XSL result tree. This tree is composed of formatting objects.

***scaling-value-citation***

The fo:scaling-value-citation is used to obtain the scale-factor applied to the cited fo:external-graphic.

***simple-page-master***

The fo:simple-page-master is used in the generation of pages and specifies the geometry of the page. The page is subdivided into regions.

***single-page-master-reference***

An fo:single-page-master-reference specifies a sub-sequence consisting of a single instance of a single page-master.

***static-content***

The fo:static-content formatting object holds a sequence or a tree of formatting objects that is to be presented in a single region or repeated in like-named regions on one or more pages in the page-sequence. Its common use is for repeating or running headers and footers.

***table***

The fo:table flow object is used for formatting the tabular material of a table.

***table-and-caption***

The fo:table-and-caption flow object is used for formatting a table together with its caption.

***table-body***

The fo:table-body formatting object is used to contain the content of the table body.

***table-caption***

The fo:table-caption formatting object is used to contain block-level formatting objects containing the caption for the table only when using the fo:table-and-caption.

***table-cell***

The fo:table-cell formatting object is used to group content to be placed in a table cell.

***table-column***

The fo:table-column formatting object specifies characteristics applicable to table cells that have the same column and span.

***table-footer***

The fo:table-footer formatting object is used to contain the content of the table footer.

***table-header***

The fo:table-header formatting object is used to contain the content of the table header.

***table-row***

The fo:table-row formatting object is used to group table-cells into rows.

***title***

The fo:title formatting object is used to associate a title with a given page-sequence. This title may be used by an interactive User Agent to identify the pages. For example, the content of the fo:title can be formatted and displayed in a "title" window or in a "tool tip".

***wrapper***

The fo:wrapper formatting object is used to specify inherited properties for a group of formatting objects. It has no additional formatting semantics.

## 6.4. Declarations and Pagination and Layout Formatting Objects

### 6.4.1. Introduction

The root node of the formatting object tree must be an fo:root formatting object. The children of the fo:root formatting object are a single fo:layout-master-set, an optional fo:declarations, an optional fo:bookmark-tree, and a sequence of one or more fo:page-sequences and/or fo:page-sequence-wrapper elements. The fo:layout-master-set defines the geometry and sequencing of the pages; the children of the fo:page-sequences, which are called *flows* (contained in fo:flow and fo:static-content), provide the content that is distributed into the pages. The fo:declarations object is a wrapper for formatting objects whose content is to be used as a resource to the formatting process. The process of generating the pages is done automatically by the XSL processor formatting the result tree.

The children of the fo:layout-master-set are the pagination and layout specifications and flow-map specifications. There are two types of pagination and layout specifications: page-masters and page-sequence-masters. Page-masters have the role of describing the intended subdivisions of a page and the geometry of these subdivisions. Page-sequence-masters have the role of describing the sequence of page-masters that will be used to generate pages during the formatting of an fo:page-sequence. Flow-maps have the role of assigning flows to regions.

### 6.4.1.1. Page-sequence-masters

Each fo:page-sequence-master characterizes a set of possible sequences of page-masters. For any given fo:page-sequence, only one of the possible set of sequences will be used. The sequence that is used is any sequence that satisfies the constraints determined by the individual page-masters, the flows which generate pages from the page-masters, and the fo:page-sequence-master itself.

The fo:page-sequence-master is used to determine which page-masters are used and in which order. The children of the fo:page-sequence-master are a sequence of sub-sequence specifications. The page-masters in a sub-sequence may be specified by a reference to a single page-master or as a repetition of one or more page-masters. For example, a sequence might begin with several explicit page-masters and continue with a repetition of some other page-master (or masters).

The fo:single-page-master-reference is used to specify a sub-sequence consisting of a single page-master.

There are two ways to specify a sub-sequence that is a repetition. The fo:repeatable-page-master-reference specifies a repetition of a single page-master. The fo:repeatable-page-master-alternatives specifies the repetition of a set of page-masters. Which of the alternative page-masters is used at a given point in the sub-sequence is conditional and may depend on whether the page number is odd or even, is the first page, is the last page, or is blank. The "maximum-repeats" property on the repetition specification controls the number of repetitions. If this property is not specified, there is no limit on the number of repetitions.

### 6.4.1.2. Page-masters

A page-master is a master that is used to generate a *page*. A page is a viewport/reference pair in which the viewport-area is a child of the area tree root. A *page-viewport-area* is defined to be the viewport-area of a page, and a *page-area* is defined to be the unique child of a page-viewport-area.

The page-viewport-area is defined by the output medium; the page-area holds the page contents and has the effect of positioning the page contents on the output medium.

A single page-master may be used multiple times. Each time it is used it generates a single page; for example, a page-master that is referenced from an fo:repeatable-page-master-reference will be used by the fo:page-sequence to generate one page for each occurrence of the reference in the specified sub-sequence.



When pages are used with a User Agent such as a Web browser, it is common that the each document has only one page. The viewport used to view the page determines the size of the page. When pages are placed on non-interactive media, such as sheets of paper, pages correspond to one or more of the surfaces of the paper. The size of the paper determines the size of the page.

In this specification, there is only one kind of page-master, the fo:simple-page-master. Future versions of this specification may add additional kinds of page-masters.

An fo:simple-page-master has, as children, specifications for one or more regions.

A region specification is used as a master, the *region-master*, in generating a viewport/reference pair consisting of a *region-viewport-area* and a *region-reference-area*. The region-viewport-area is always a child of a page-area generated using the parent of the region-master.



The regions on the page are analogous to "frames" in an HTML document. Typically, at least one of these regions is of indefinite length in one of its dimensions. For languages with a lr-tb (or rl-tb) writing-mode, this region is typically of indefinite length in the top-to-bottom direction. The viewport represents the visible part of the frame. The flows assigned to the region are viewed by scrolling the region reference-area through the viewport.

Each region is defined by a region formatting object. Each region formatting object has a name and a definite position. In addition, the region's height or width is fixed and the other dimension may be either fixed or indefinite. For example, a region that is the body of a Web page may have indefinite height.

The specification of the region determines the size and position of region-viewport-areas generated using the region formatting object. The positioning of the viewport is relative to its page-area parent.

For version 1.1 of this Recommendation, a page-master will consist of the following regions: "region-body" (one or more) and four other regions, one on each side of the body. To allow the side regions to correspond to the current writing-mode, these regions are named "region-before" (which corresponds to "header" in the "lr-tb" writing-mode), "region-after" (which corresponds to "footer" in the "lr-tb" writing-mode), "region-start" (which corresponds to a "left-sidebar" in the "lr-tb" writing-mode) and "region-end" (which corresponds to a "right-sidebar" in the "lr-tb" writing-mode). It is expected that a future version of the Recommendation will introduce a mechanism that allows a page-master to contain an arbitrary number of arbitrarily sized and positioned regions.

Some types of region have conditional sub-regions associated with them, and the associated region-reference-areas are divided up by having child areas corresponding to the sub-regions, including a "main-reference-area" for the region. For region-masters to which the column-count property applies, the main-reference-area is further subdivided by having child-areas designated as "span-reference-areas" whose number depends upon the number of spans (i.e. block-areas with span="all") occurring on the page. These in turn are subdivided by having child-areas designated as "normal-flow-reference-areas", whose number depends on the number of columns specified.

#### 6.4.1.3. Page Generation

Pages are generated by the formatter's processing of fo:page-sequences. As noted above, each page is a viewport/reference pair in which the viewport-area is a child of the area tree root. Each page is generated using a page-master to define the region-viewport-areas and region-reference-areas that correspond to the regions specified by that page-master.

Each fo:page-sequence references either an fo:page-sequence-master or a page-master. If the reference is to a page-master, this is interpreted as if it were a reference to an fo:page-sequence-master that repeats the referenced page-master an unbounded number of times. An fo:page-sequence references a page-master if either the fo:page-sequence directly references the page-master via the "master-reference" property or that property references an fo:page-sequence-master that references the page-master.

#### 6.4.1.4. Flows and Flow Mapping

There are two kinds of *flows*: fo:static-content and fo:flow. An fo:static-content flow holds content, such as the text that goes into headers and footers, that is repeated on many of the pages. An fo:flow flow holds content that is distributed across a sequence of pages. The processing of the fo:flow flows is what determines how many pages are generated to hold the fo:page-sequence. The fo:page-sequence-master is used as the generator of the sequence of page-masters into which the flow children content is distributed.

The children of a flow are a sequence of block-level flow objects. Each flow has a name that is given by its "flow-name" property. No two flows that are children of the same fo:page-sequence may have the same name.

The assignment of flows to regions on a page-master is determined by a *flow-map*. The flow-map is an association between the flow children of the fo:page-sequence and regions defined within the page-masters referenced by that fo:page-sequence.

Flow-maps are specified by fo:flow-map formatting objects. An fo:page-sequence uses the flow-map indicated by its flow-map-reference property when assigning its flows to regions. If the flow-map-reference property is not specified for the page-sequence then the implicit flow-map is used for that page-sequence, as in version 1.0 of this Recommendation. The "flow-name" property of a flow specifies to which region that flow is assigned. Each region has a "region-name" property. The flow-map assigns a flow to the region that has the same name.

To avoid requiring users to generate region-names, the regions all have default values for the "region-name" property. The region-body, region-before, region-after, region-start, and region-end have the default names "xsl-region-body", "xsl-region-before", "xsl-region-after", "xsl-region-start", and "xsl-region-end", respectively. It is an error for a page master to have two region-body descendants with the default region-name.

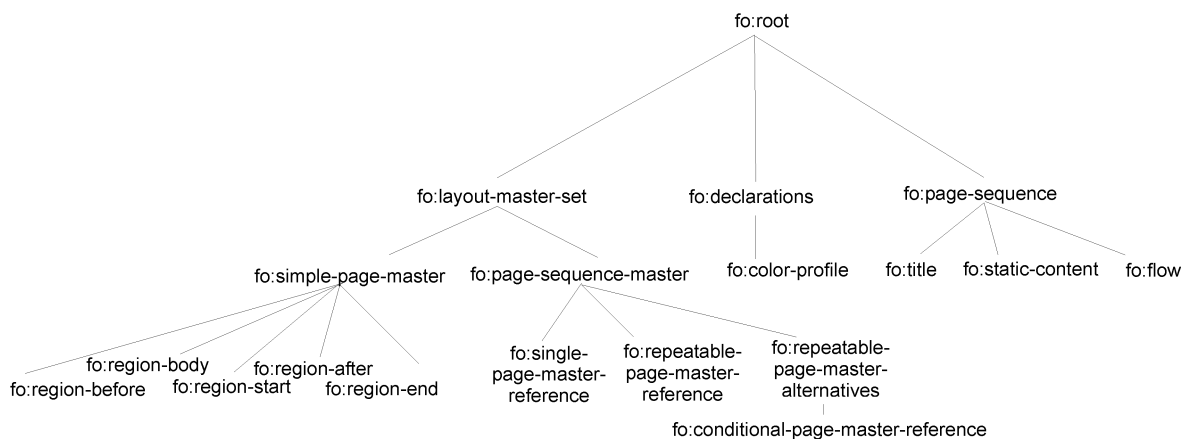
In addition, an fo:static-content formatting object may have a "flow-name" property value of "xsl-before-float-separator" or "xsl-footnote-separator". If a conditional sub-region of the region-body is used to generate a reference-area on a particular page, the fo:static-content whose name corresponds to the conditional sub-region shall be formatted into the reference-area associated with the sub-region, as specified in § 6.12.1.3 – Conditional Sub-Regions on page 210.

#### 6.4.1.5. Constraints on Page Generation

The areas that are descendants of a page-area are constrained by the page-master used to generate the page-area and the flows that are assigned to the regions specified on the page-master. For fo:flow flows, the areas generated by the descendants of the flow are distributed across the pages in the sequence according to the flow-map in effect for that page-sequence. For fo:static-content flows, the processing of the flow is repeated for each page generated using a page-master having the region to which the flow is assigned with two exceptions: for an fo:static-content with a *flow-name* of *xsl-before-float-separator*, the processing is repeated only for those page-reference-areas which have descendant areas with an area-class of *xsl-before-float*, and for an fo:static-content with a *flow-name* of *xsl-footnote-separator*, the processing is repeated only for those page-reference-areas which have descendant areas with an area-class of *xsl-footnote*.

#### 6.4.1.6. Pagination Tree Structure

The result tree structure is shown below.

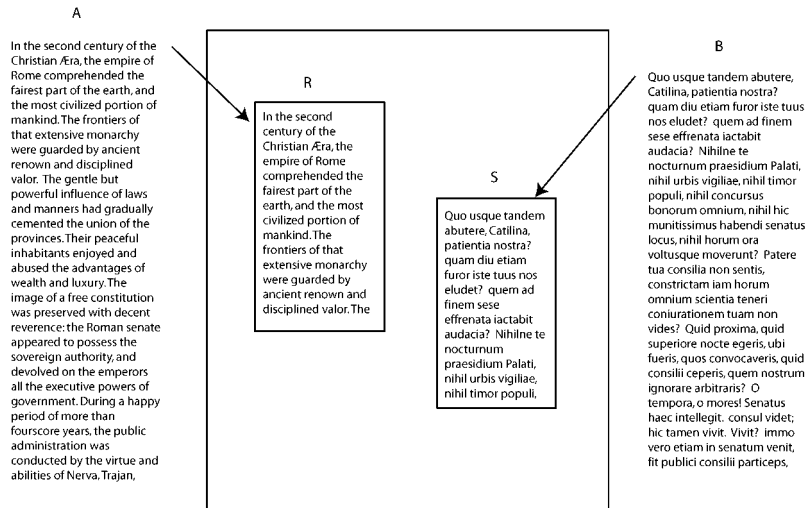


**Tree Representation of the Formatting Objects for Pagination**

### 6.4.1.7. Example Flow Maps

A typical use of flow maps are where there are two or more flows that each, independently of each other, flow into separate regions on the pages. Another one is when the flow is flowed from one region into another region on the same page and continuing onto further pages. A third use is when two or more flows are “concatenated”; each flow beginning where the previous one ends.

#### 6.4.1.7.1. Two flows mapping into their own regions



Mapping flow A to region R, flow B to region S

In this case the flows are specified as:

```
<fo:flow flow-name="A">
  <fo:block>In the second century of
the Christian Aera, the empire of Rome ... </fo:block>
</fo:flow>
```

and

```
<fo:flow flow-name="B">
  <fo:block>Quo usque tandem abutere, Catilina, patientia nostra? ...
</fo:block>
</fo:flow>
```

The regions are specified with *region-name="R"* and *region-name="S"*, respectively, and the flow map is specified as follows:

```
<fo:flow-map flow-map-name="E1">
  <fo:flow-assignment>
    <fo:flow-source-list>
      <fo:flow-name-specifier flow-name-reference="A" />
    </fo:flow-source-list>
    <fo:flow-target-list>
      <fo:region-name-specifier region-name-reference="R" />
    </fo:flow-target-list>
  </fo:flow-assignment>
```

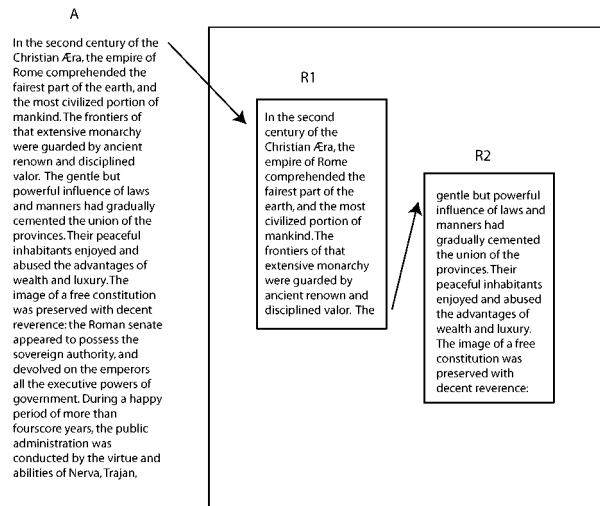


```

<fo:flow-assignment>
  <fo:flow-source-list>
    <fo:flow-name-specifier flow-name-reference="B" />
  </fo:flow-source-list>
  <fo:flow-target-list>
    <fo:region-name-specifier region-name-reference="S" />
  </fo:flow-target-list>
</fo:flow-assignment>
</fo:flow-map>

```

#### 6.4.1.7.2. A flow mapping into two regions



#### Mapping flow A to regions R1 and R2

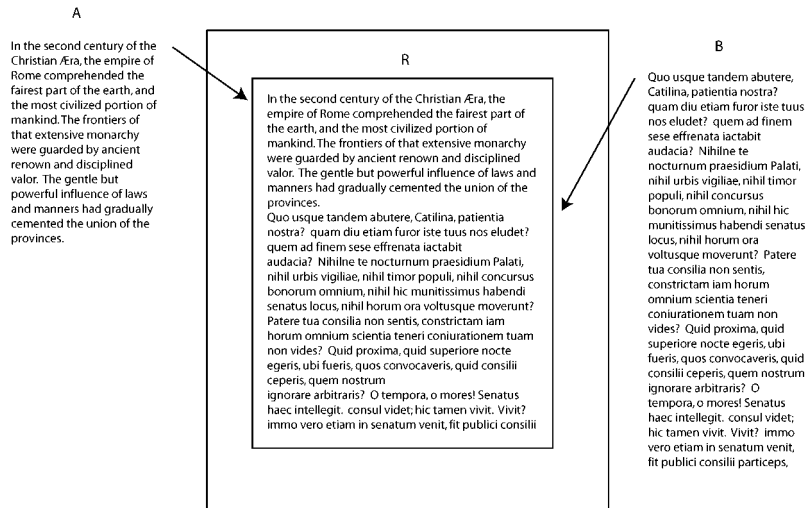
In this case the flow map is specified as follows:

```

<fo:flow-map flow-map-name="E2">
  <fo:flow-assignment>
    <fo:flow-source-list>
      <fo:flow-name-specifier flow-name-reference="A" />
    </fo:flow-source-list>
    <fo:flow-target-list>
      <fo:region-name-specifier region-name-reference="R1" />
      <fo:region-name-specifier region-name-reference="R2" />
    </fo:flow-target-list>
  </fo:flow-assignment>
</fo:flow-map>

```

### 6.4.1.7.3. Two flows mapping into a region

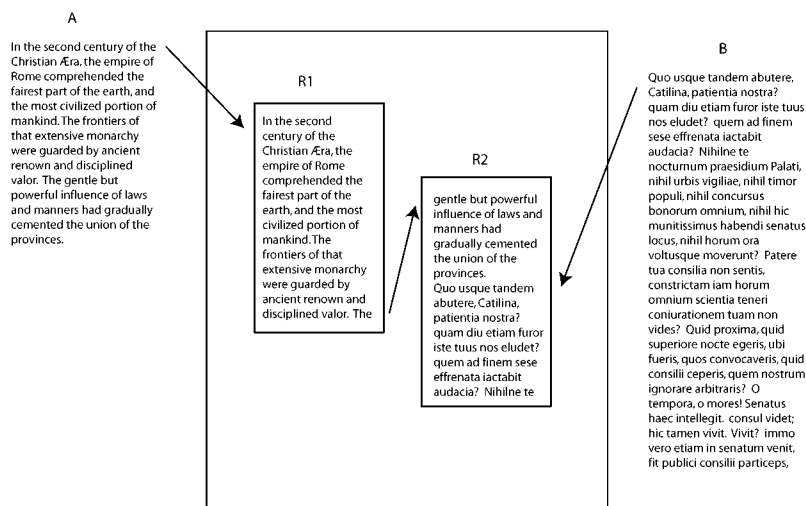


**Mapping flows A and B to region R**

In this case the flow map is specified as follows:

```
<fo:flow-map flow-map-name="E3">
  <fo:flow-assignment>
    <fo:flow-source-list>
      <fo:flow-name-specifier flow-name-reference="A" />
      <fo:flow-name-specifier flow-name-reference="B" />
    </fo:flow-source-list>
    <fo:flow-target-list>
      <fo:region-name-specifier region-name-reference="R" />
    </fo:flow-target-list>
  </fo:flow-assignment>
</fo:flow-map>
```

### 6.4.1.7.4. Two flows mapping into two regions



## Mapping flows A and B to regions R1 and R2

In this case the flow map is specified as follows:

```
<fo:flow-map flow-map-name="E4">
  <fo:flow-assignment>
    <fo:flow-source-list>
      <fo:flow-name-specifier flow-name-reference="A"/>
      <fo:flow-name-specifier flow-name-reference="B"/>
    </fo:flow-source-list>
    <fo:flow-target-list>
      <fo:region-name-specifier region-name-reference="R1"/>
      <fo:region-name-specifier region-name-reference="R2"/>
    </fo:flow-target-list>
  </fo:flow-assignment>
</fo:flow-map>
```

### 6.4.2. fo:root

*Common Usage:*

This is the top node of the formatting object tree. It holds an fo:layout-master-set formatting object (which holds all masters used in the document), an optional fo:declarations, an optional fo:bookmark-tree, and one or more fo:page-sequence or fo:page-sequence-wrapper objects. Each fo:page-sequence represents a sequence of pages that result from formatting the content children of the fo:page-sequence. An fo:page-sequence-wrapper can also occur as the child of fo:root. An fo:page-sequence-wrapper can contain zero or more fo:page-sequence objects or fo:page-sequence-wrappers. The fo:page-sequence-wrapper is used to specify inherited properties for the fo:page-sequence objects it wraps; it has no additional formatting semantics.



A document can contain multiple fo:page-sequences. For example, each chapter of a document could be a separate fo:page-sequence; this would allow chapter-specific content, such as the chapter title, to be placed within a header or footer.

*Areas:*

Page-viewport-areas are returned by the fo:page-sequence children of the fo:root formatting object. The fo:root does not generate any areas.

*Constraints:*

The children of the root of the area tree consist solely of, and totally of, the page-viewport-areas returned by the fo:page-sequence children of the fo:root. The set of all areas returned by the fo:page-sequence children is *properly ordered*. (See Section § 4.7.1 – [General Ordering Constraints](#) on page 38.)

*Contents:*

([layout-master-set](#), [declarations?](#), [bookmark-tree?](#), ([page-sequence](#) | [page-sequence-wrapper](#))<sup>+</sup>)

It is an error if there is not at least one fo:page-sequence descendant of fo:root.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237

- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “media-usage” — § 7.27.11 on page 376

### 6.4.3. fo:declarations

#### *Common Usage:*

The fo:declarations formatting object is used to group global declarations for a stylesheet.

#### *Areas:*

The fo:declarations formatting object does not generate or return any areas.

#### *Constraints:*

None.

#### *Contents:*

(`color-profile`)\*

The fo:declarations formatting object may have additional child elements in a non-XSL namespace. Their presence does not, however, change the semantics of the XSL namespace objects and properties. The permitted structure of these non-XSL namespace elements is defined for their namespace(s).

### 6.4.4. fo:color-profile

#### *Common Usage:*

The fo:color-profile formatting object is used to declare an ICC Color Profile for a stylesheet. The color-profile is referenced again via the name specified in the "color-profile-name" property.

The color-profile is identified by the URI specified in the "src" property value. This URI may identify an internally recognized color-profile or it may point to a ICC Color Profile encoding that should be loaded and interpreted.

When the color-profile is referenced (e.g., via the `rgb-icc` function § 5.10.2 – [Color Functions](#) on page 65), the following rules are used:

1. If the color-profile is available, the color value identified from the color-profile should be used.
2. If the color-profile is not available, the sRGB (`[sRGB]`) fallback must be used.

#### *Areas:*

The fo:color-profile formatting object does not generate or return any areas.

#### *Constraints:*

None.

#### *Contents:*

EMPTY

*The following properties apply to this formatting object:*

- “src” — § 7.30.16 on page 413
- “color-profile-name” — § 7.18.2 on page 336

- “[rendering-intent](#)” — § 7.18.3 on page 336

### 6.4.5. fo:page-sequence

*Common Usage:*

The fo:page-sequence formatting object is used to specify how to create a (sub-)sequence of pages within a document; for example, a chapter of a report. The content of these pages comes from flow children of the fo:page-sequence as assigned by the flow-map in effect for that fo:page-sequence. The layout of these pages comes from the fo:page-sequence-master or page-master referenced by the *master-reference* trait on the fo:page-sequence. The sequence of areas returned by each of the flow-object children of the fo:page-sequence are made descendants of the generated pages as described below.

*Areas:*

The fo:page-sequence formatting object generates a sequence of viewport/reference pairs, and returns the page-viewport-areas. For each page-reference-area, and each region specified in the page-master used to generate that page-reference-area, the fo:page-sequence object also generates the viewport/reference pair for the occurrence of that region in that page-reference-area, and may generate a before-float-reference-area, footnote-reference-area, and main-reference-area, and one or more normal-flow-reference-areas. The generation of these further areas is described in the descriptions of the fo:simple-page-master, region-masters and fo:flow-map. It may also generate a title-area.

All areas generated by an fo:page-sequence have area-class "xsl-absolute".

The page-viewport-areas identify one of the sides as a page binding edge. This recommendation does not specify the mechanism for selecting which side is the page binding edge.



If the User Agent can determine that the result is to be bound, then the page binding edge of any given page is the edge on which that page is intended to be bound.

Commonly the page binding edge of a page with an odd folio-number is the start-edge of that page and the binding-edge of a page with an even folio-number is the end-edge of that page.


The binding can be as simple as stapling or may be as complex as producing a book using an imposition scheme.

For each formatting object descendant *D* under the change bar influence of a given fo:change-bar-begin object *F* (as defined in § 6.13.2 – [fo:change-bar-begin](#) on page 226), the fo:page-sequence generates a "change bar area" for each area *A* returned by *D*, as a child of the ancestor region-area of *A*. Each change bar area is of class xsl-absolute, with zero margin and padding, with border-end-color given by the change-bar-color of *F*, with border-end-style given by the change-bar-style of *F*, with border-end-width given by the change-bar-width of *F*, with inline progression-dimension equal to zero and block-progression-dimension equal to the dimension of *A* parallel to the block-progression-dimension of the region-area.

The change bar area is positioned to be adjacent to the nearest ancestor area *C* of *A* which is either a normal-flow-reference-area or region-reference-area. The change bar area is aligned with *A* and lies away from *C* by a distance given by the change-bar-offset of *F*, with respect to the start-edge or the end-edge of *C* as determined by the change-bar-placement trait of *F*.

*Trait Derivation:*

The *reference-orientation* and *writing-mode* of the region-viewport-areas are determined by the values of the "reference-orientation" and "writing-mode" properties of the fo:page-sequence.

 The value may be given as an explicit value or the `from-page-master-region` function may be used to obtain the value specified on the layout formatting object being used to generate the region viewport/reference area pair.

#### Constraints:

Each page-viewport-area/page-reference-area pair is generated using a page-master that satisfies the constraints of the page-sequence-master identified by the *master-reference* trait of the `fo:page-sequence` or a page-master that was directly identified by the *master-reference* trait. The region-viewport-area children of such a page-reference-area must correspond to the regions that are children of that page-master.

The areas generated by the `fo:page-sequence` have as their descendants the areas returned by the flows that are children of the `fo:page-sequence`.

The areas returned to the `fo:page-sequence` by a flow must satisfy five types of constraints:

- *Completeness.* All areas returned by formatting object descendants of the flow children of the `fo:page-sequence` become descendants of areas generated by the `fo:page-sequence`, with the exception of glyph-areas subject to deletion or substitution as in Sections § 4.7.2 – [Line-building](#) on page 38 and § 4.7.3 – [Inline-building](#) on page 39.
- *Flow-map association.* The areas returned from a flow child of the `fo:page-sequence` must be descendants of region-reference-areas generated using regions to which the flow is assigned by the flow-map in effect.

Areas returned from an `fo:static-content` with a *flow-name* of *xsl-before-float-separator* become children of the before-float-reference-area of an area associated to an `fo:region-body`, following all sibling areas of area-class *xsl-before-float*. Areas returned from an `fo:static-content` with a *flow-name* of *xsl-footnote-separator* become children of the footnote-reference-area of an area associated to an `fo:region-body`, preceding all sibling areas of area-class *xsl-footnote*.

If the flow-map-reference is specified, the flow-map in effect is the one described by the `fo:flow-map` child of the `fo:layout-master-set` having a flow-map-name matching the specified value of flow-map-reference on the `fo:page-sequence`. If the flow-map-reference is not specified, the flow-map in effect is the implicit flow-map shown in § 6.4.22 – [fo:flow-map](#) on page 113.

- *Area-class association.* Areas returned by flow children of an `fo:page-sequence` are distributed as follows:
  - All areas of area-class *xsl-footnote*, and all areas returned from an `fo:static-content` with a flow-name of *xsl-footnote-separator*, must be descendants of a footnote-reference-area;
  - all areas of area-class *xsl-before-float*, and all areas returned from an `fo:static-content` with a flow-name of *xsl-before-float-separator*, must be descendants of a before-float-reference-area;

all other areas must be descendants of a region-reference-area and further they must be descendants of a main-reference-area child of that region-reference-area if it has one.

- *Stacking.* The stackable areas of a given class returned by children of each flow are properly stacked within the appropriate reference-area, as described above.
- *Flow-assignment ordering.* The default ordering constraint of § 4.7.1 – [General Ordering Constraints](#) on page 38 does not apply to the `fo:page-sequence`. The default ordering constraint applies to the flow object children inside each `fo:flow`; special ordering constraints apply to the child `fo:static-content` objects.

If the flow-map in effect for a page-sequence has a flow-assignment child with flow-source-list  $S$  and flow-target-list  $T$  and the child flow-name-specifiers of  $S$  have flow-name-reference values  $F_1, \dots, F_m$ , and the child region-name-specifiers of  $T$  have region-name-reference values  $R_1, \dots, R_n$ , then for each area-class  $C$ , the areas returned to the page-sequence belonging to that class have the same order in the area tree (relative to the region ordering) as their generating formatting objects (relative to the flow ordering). That is, if  $A$  and  $B$  are areas of area-class  $C$  and either  $A$  and  $B$  are returned by the same flow with  $A$  returned prior to  $B$ , or  $A$  and  $B$  are returned by flows with flow-name values  $F_i$  and  $F_j$ , respectively, for some  $i$  and  $j$  such that  $i < j$ , then one of the following conditions must hold:

- the ancestor page-reference-area of  $A$  precedes the ancestor page-reference-area of  $B$ , or
- $A$  and  $B$  share the same ancestor page-reference-area,  $A$  is a descendant of a region-reference-area generated using a region whose region-name value is  $R_k$  and  $B$  is a descendant of a region-reference-area generated using a region whose region-name value is  $R_l$  for some  $k$  and  $l$  such that  $k < l$ , or
- $A$  and  $B$  are descendants of the same region-reference-area and  $A$  precedes  $B$  in the pre-order-tree traversal of the area tree.

If a title-area is generated the following constraints must be satisfied:

- *Completeness*. All areas returned by formatting object descendants of the fo:title child of the fo:page-sequence become descendants of the title-area generated by the fo:page-sequence, with the exception of glyph-areas subject to deletion or substitution as in Sections § 4.7.2 – [Line-building](#) on page 38 and § 4.7.3 – [Inline-building](#) on page 39.
- *Stacking*. The areas returned by children of the fo:title are properly stacked within the title-area.

The default ordering constraint of section § 4.7.1 – [General Ordering Constraints](#) on page 38 does apply to the fo:title.

*Contents:*

`(title?, folio-prefix?, folio-suffix?, static-content*, flow+)`

*The following properties apply to this formatting object:*

- “country” — § 7.10.1 on page 280
- “flow-map-reference” — § 7.27.19 on page 381
- “format” — § 7.26.1 on page 369
- “language” — § 7.10.2 on page 280
- “letter-value” — § 7.26.4 on page 370
- “grouping-separator” — § 7.26.2 on page 369
- “grouping-size” — § 7.26.3 on page 369
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “initial-page-number” — § 7.27.7 on page 373
- “force-page-count” — § 7.27.6 on page 372
- “master-reference” — § 7.27.9 on page 374
- “reference-orientation” — § 7.21.3 on page 349
- “writing-mode” — § 7.29.7 on page 401

### 6.4.6. fo:page-sequence-wrapper

#### Common Usage:

The fo:page-sequence-wrapper formatting object is used to specify inherited properties for a group of fo:page-sequence formatting objects.

#### Areas:

The fo:page-sequence-wrapper formatting object does not generate any areas. The fo:page-sequence-wrapper formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of the children of the fo:page-sequence-wrapper.

#### Trait Derivation:

Except for "id", "index-class", and "index-key", the fo:page-sequence-wrapper has no properties that are directly used by it. However, it does serve as a carrier to hold inheritable properties that are utilized by its children.

#### Constraints:

The order of concatenation of the sequences of areas returned by the children of the fo:page-sequence-wrapper is the same order as the children are ordered under the fo:page-sequence-wrapper. An fo:page-sequence-wrapper that contains no fo:page-sequence objects as descendants returns no areas.



Because an fo:page-sequence-wrapper that contains no fo:page-sequence objects as descendants returns no areas, any id, index-key, or index-class property on such an fo:page-sequence-wrapper is ignored; the result would be as if they were not assigned on this FO. In particular, any attempt to refer to this id would result in the same action as if this id were never declared within the FO result tree.

#### Contents:

([page-sequence](#) | [page-sequence-wrapper](#)) \*

The following properties apply to this formatting object:

- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363

### 6.4.7. fo:layout-master-set

#### Common Usage:

The fo:layout-master-set is a wrapper around all masters used in the document. This includes page-sequence-masters, page-masters, and flow-maps.

#### Areas:

The fo:layout-master-set formatting object generates no area directly. The masters that are the children of the fo:layout-master-set are used by the fo:page-sequence to generate pages.

#### Constraints:

The value of the *master-name* trait on each child of the fo:layout-master-set must be unique within the set.




*Contents:*

([simple-page-master](#) | [page-sequence-master](#) | [flow-map](#)) +

### 6.4.8. fo:page-sequence-master

*Common Usage:*

The fo:page-sequence-master is used to specify the constraints on and the order in which a given set of page-masters will be used in generating a sequence of pages. Pages are automatically generated when the fo:page-sequence-master is used in formatting an fo:page-sequence.

 There are several ways of specifying a potential sequence of pages. One can specify a sequence of references to particular page-masters. This yields a bounded sequence of potential pages. Alternatively, one can specify a repeating sub-sequence of one or more page-masters. This sub-sequence can be bounded or unbounded. Finally one can intermix the two kinds of sub-sequence-specifiers.

*Areas:*

The fo:page-sequence-master formatting object generates no area directly. It is used by the fo:page-sequence formatting object to generate pages.

*Constraints:*

The children of the fo:page-sequence-master are a sequence of *sub-sequence-specifiers*. A page-sequence satisfies the constraint determined by an fo:page-sequence-master if (a) it can be partitioned into a sequence of sub-sequences of pages that map one-to-one to an initial sub-sequence of the sequence of sub-sequence-specifiers that are the children of the fo:page-sequence-master and, (b) for each sub-sequence of pages in the partition, that sub-sequence satisfies the constraints of the corresponding sub-sequence-specifier. The sequence of sub-sequences of pages can be shorter than the sequence of sub-sequence-specifiers.

It is an error if the entire sequence of sub-sequence-specifiers children is exhausted while some areas returned by an fo:flow are not placed. Implementations may recover, if possible, by re-using the sub-sequence-specifier that was last used to generate a page.

*Contents:*

([single-page-master-reference](#) | [repeatable-page-master-reference](#) | [repeatable-page-master-alternatives](#)) +

*The following properties apply to this formatting object:*

- “[master-name](#)” — § 7.27.8 on page 374

### 6.4.9. fo:single-page-master-reference

*Common Usage:*

An fo:single-page-master-reference is the simplest sub-sequence-specifier. It specifies a sub-sequence consisting of a single instance of a single page-master. It is used to specify the use of a particular page-master at a given point in the sequence of pages that would be generated using the fo:page-sequence-master that is the parent of the fo:single-page-master-reference.

*Areas:*

The fo:single-page-master-reference formatting object generates no area directly. It is used by the fo:page-sequence formatting object to generate pages.

*Constraints:*

The `fo:single-page-master-reference` has a reference to the `fo:simple-page-master` which has the same `master-name` as the *master-reference* trait on the `fo:single-page-master-reference`.

The sub-sequence of pages mapped to this sub-sequence-specifier satisfies the constraints of this sub-sequence-specifier if (a) the sub-sequence of pages consists of a single page and (b) that page is constrained to have been generated using the `fo:simple-page-master` referenced by the `fo:single-page-master-reference`.

*Contents:*

EMPTY

The following properties apply to this formatting object:

- “[master-reference](#)” — § 7.27.9 on page 374

**6.4.10. fo:repeatable-page-master-reference***Common Usage:*

An `fo:repeatable-page-master-reference` is the next simplest sub-sequence-specifier. It specifies a sub-sequence consisting of repeated instances of a single page-master. The number of repetitions may be bounded or potentially unbounded.

*Areas:*

The `fo:repeatable-page-master-reference` formatting object generates no area directly. It is used by the `fo:page-sequence` formatting object to generate pages.

*Constraints:*

The `fo:repeatable-page-master-reference` has a reference to the `fo:simple-page-master` which has the same `master-name` as the *master-reference* trait on the `fo:repeatable-page-master-reference`.

The sub-sequence of pages mapped to this sub-sequence-specifier satisfies the constraints of this sub-sequence-specifier if (a) the sub-sequence of pages consists of zero or more pages, (b) each page is generated using the `fo:simple-page-master` referenced by the `fo:repeatable-page-master-reference`, and (c) length of the sub-sequence is less than or equal to the value of *maximum-repeats*.

If no region-master child of the page-master referred to by this formatting object has a region-name associated to any flow in an `fo:page-sequence`, then the sub-sequence is constrained to have length zero.

*Contents:*

EMPTY


The following properties apply to this formatting object:

- “[master-reference](#)” — § 7.27.9 on page 374
- “[maximum-repeats](#)” — § 7.27.10 on page 375

**6.4.11. fo:repeatable-page-master-alternatives***Common Usage:*

The `fo:repeatable-page-master-alternatives` formatting object is the most complex sub-sequence-specifier. It specifies a sub-sequence consisting of repeated instances of a set of alternative page-masters. The

number of repetitions may be bounded or potentially unbounded. Which of the alternative page-masters is used at any point in the sequence depends on the evaluation of a condition on the use of the alternative. Typical conditions include, testing whether the page which is generated using the alternative is the first or last page in a page-sequence or is the page blank. The full set of conditions allows different page-masters to be used for the first page, for odd and even pages, for blank pages, etc.

 Because the conditions are tested in order from the beginning of the sequence of children, the last alternative in the sequence usually has a condition that is always true and this alternative references the page-master that is used for all pages that do not receive some specialized layout.

#### Areas:

The `fo:repeatable-page-master-alternatives` formatting object generates no area directly. This formatting object is used by the `fo:page-sequence` formatting object to generate pages.

#### Constraints:

The children of the `fo:repeatable-page-master-alternatives` are `fo:conditional-page-master-references`. These children are called *alternatives*.

The sub-sequence of pages mapped to this sub-sequence-specifier satisfies the constraints of this sub-sequence-specifier if (a) the sub-sequence of pages consists of zero or more pages, (b) each page is generated using the `fo:simple-page-master` referenced by the one of the alternatives that are the children of the `fo:repeatable-page-master-alternatives`, (c) the conditions on that alternative are *true*, (d) that alternative is the first alternative in the sequence of children for which all the conditions are *true*, and (e) the length of the sub-sequence is less than or equal to the value of *maximum-repeats*.

#### Contents:

(`conditional-page-master-reference`+)

The following properties apply to this formatting object:

- “`maximum-repeats`” — § 7.27.10 on page 375

### 6.4.12. `fo:conditional-page-master-reference`

#### Common Usage:

The `fo:conditional-page-master-reference` is used to identify a page-master that is to be used when the conditions on its use are satisfied. This allows different page-masters to be used, for example, for even and odd pages, for the first page in a page-sequence, or for blank pages. This usage is typical in chapters of a book or report where the first page has a different layout than the rest of the chapter and the headings and footings on even and odd pages may be different as well.


#### Areas:

The `fo:conditional-page-master-reference` formatting object generates no area directly. It is used by the `fo:page-sequence` formatting object to generate pages.

#### Constraints:

The `fo:conditional-page-master-reference` has a reference to the `fo:simple-page-master` which has the same *master-name* as the *master-reference* trait on the `fo:conditional-page-master-reference`.


There are three traits, *page-position*, *odd-or-even*, and *blank-or-not-blank* that specify the sub-conditions on the use of the referenced page-master. All three sub-conditions must be *true* for the condition on the `fo:conditional-page-master-reference` to be *true*.

 Since the properties from which these traits are derived are not inherited and the initial value of all the properties makes the corresponding sub-condition *true*, only the subset of traits that are derived from properties with specified values must have their corresponding sub-condition be *true*.

The sub-condition corresponding to the *page-position* trait is *true* if the page generated using the `fo:conditional-page-master-reference` has the specified position in the sequence of pages generated by the referencing page-sequence; namely, "first", "last", "only" (both first and last), "rest" (not first nor last) or "any" (all of the previous). The *referencing page-sequence* is the `fo:page-sequence` that referenced the `fo:page-sequence-master` from which this `fo:conditional-page-master-reference` is a descendant.

The sub-condition corresponding to the *odd-or-even* trait is *true* if the value of the *odd-or-even* trait is "any" or if the value matches the parity of the page number of the page generated using the `fo:conditional-page-master-reference`.

The sub-condition corresponding to the *blank-or-not-blank* trait is *true*, if (1) the value of the trait is "not-blank" and the page generated using the `fo:conditional-page-master-reference` has areas generated by descendants of the `fo:flow` formatting objects; if (2) the value of the trait is "blank" and the page generated using the `fo:conditional-page-master-reference` is such that there are no areas from any `fo:flow` to be put on that page (e.g., (a) to maintain proper page parity due to (i) a break-after or break-before value of "even-page" or "odd-page" or (ii) at the start or end of the page-sequence or (b) because the constraints on the areas generated by descendants of the `fo:flow` formatting objects would not be satisfied if they were descendant from this page); or if (3) the value of the trait is "any".

 A "blank page" is a page generated under (2) of the sub-condition corresponding to "blank-or-not-blank" above. This has nothing to do with whether the page appears completely blank to the reader.

*Contents:*

EMPTY


*The following properties apply to this formatting object:*


- "master-reference" — § 7.27.9 on page 374
- "page-position" — § 7.27.14 on page 378
- "odd-or-even" — § 7.27.12 on page 377
- "blank-or-not-blank" — § 7.27.1 on page 370

### 6.4.13. `fo:simple-page-master`

*Common Usage:*

The `fo:simple-page-master` is used in the generation of pages and specifies the geometry of the page. The page is subdivided into regions: one or more region-body, and up to four other regions: region-before, region-after, region-start, and region-end.

 For example, if the *writing-mode* of the `fo:simple-page-master` is "lr-tb", then these regions correspond to the body of a document, the header, the footer, the left sidebar, and the right sidebar.

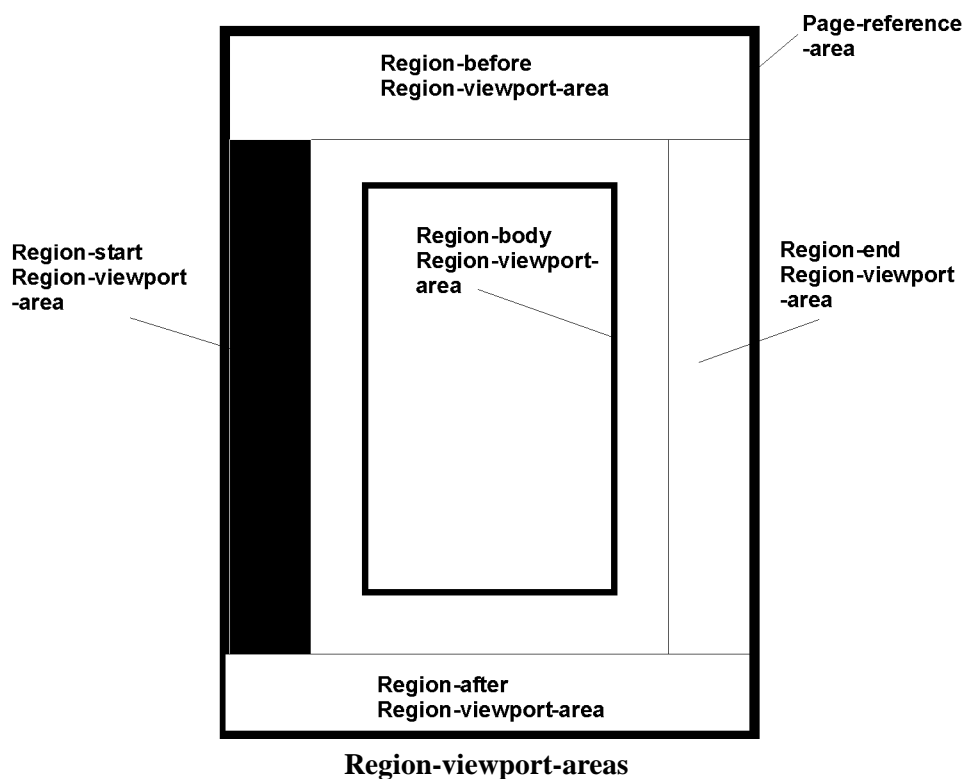
 The simple-page-master is intended for systems that wish to provide a simple page layout facility. Future versions of this Recommendation may support more complex page layouts constructed using the fo:page-master formatting object.

#### Areas:

The fo:simple-page-master formatting object generates no area directly. It is used in the generation of pages by an fo:page-sequence.

When the fo:simple-page-master is used to generate a page, a viewport/reference pair is generated, consisting of a page-viewport-area and a page-reference-area. The page-viewport-area represents the physical bounds of the output medium. The page-reference-area represents the portion of the page on which content is intended to appear; that is, the area inside the page margins.

In addition, when the fo:simple-page-master is used to generate a page, viewport/reference pairs that correspond to the regions that are the children of the fo:simple-page-master are also generated. (See the formatting object specifications for the five regions (§ 6.4.14 – fo:region-body on page 102, § 6.4.15 – fo:region-before on page 106, § 6.4.16 – fo:region-after on page 107, § 6.4.17 – fo:region-start on page 108, and § 6.4.18 – fo:region-end on page 110) for the details on the generation of these areas.) The "writing-mode" of the page is used to determine the placement of the five regions on the master.



The spacing between the outer four regions and each fo:region-body is determined by subtracting the relevant *extent* trait on each outer region from the "margin-x" property on that fo:region-body.

#### Trait Derivation:


The *reference-orientation* of the page-reference-area and *writing-mode* of the page-viewport-area are determined by the formatting object that generates the area (see § 6.4.5 – fo:page-sequence on page 91). The *writing-mode* of the page-reference-area is set to the same value as that of the page-viewport-area.

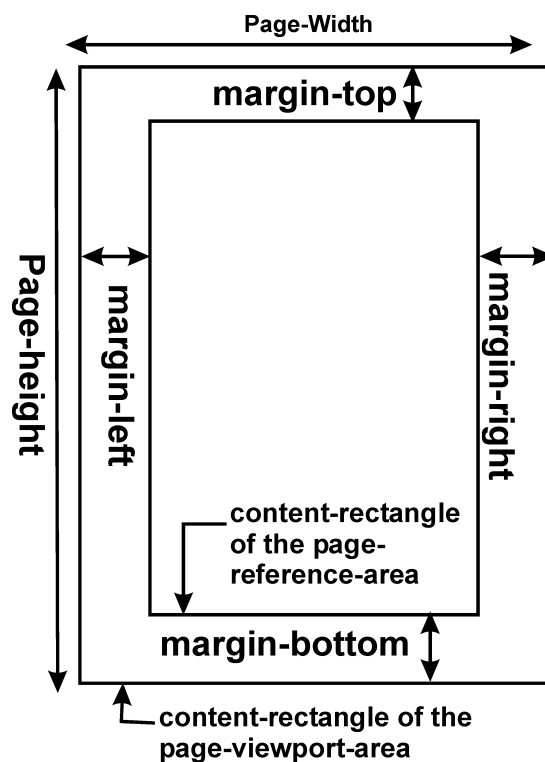
Reference-orientation does not affect the page-viewport-area and its *reference-orientation* is set to "0". Borders and padding are not allowed with a page-reference-area. The remaining traits on the page-reference-area are set according to the normal rules for determining the values of traits.

*Constraints:*

When a page-master is used in the generation of a page, the *block-progression-dimension* and *inline-progression-dimension* of the content-rectangle of the page-viewport-area are determined using the computed values of the "page-height" and "page-width" properties. For sheet media, the computed values of the "page-height" and "page-width" properties determine the orientation of the sheet; "page-height" is measured from "top" to "bottom". For display media, the display window is always upright; the top of the display screen is "top".

The traits derived from the "margin-top", "margin-bottom", "margin-left" and "margin-right" properties are used to indent the page-reference-area content-rectangle from the corresponding edge of the content-rectangle of the page-viewport-area.

 The reference points for the page-viewport-area content-rectangle are in terms of the "top", "bottom", "left", and "right" rather than "before-edge", "after-edge", "start-edge", and "end-edge" because users see the media relative to its orientation and not relative to the *writing-mode* currently in use.

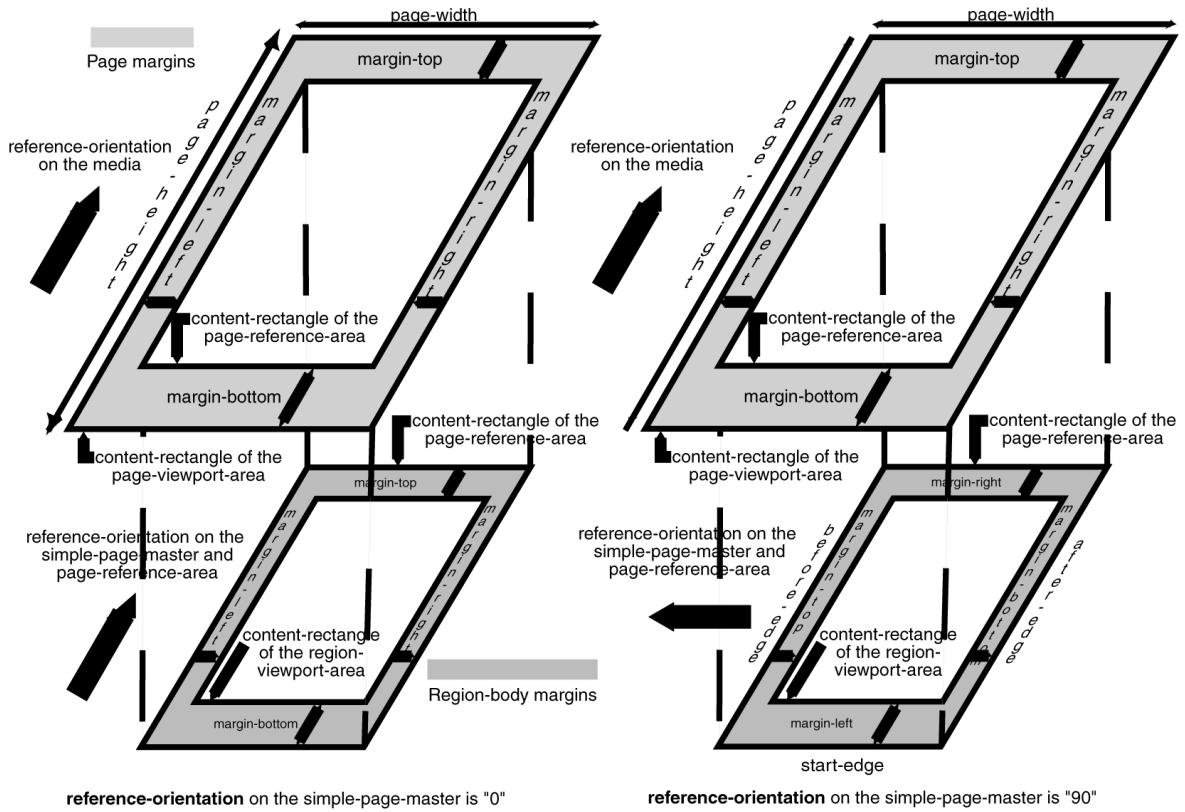


The value of the *folio-number* trait on the first page returned by the fo:page-sequence is constrained to equal the value of the *initial-page-number* trait. The value of the *folio-number* trait on subsequent pages is constrained to be one greater than the value on the immediately preceding page.

The *format*, *letter-value*, *grouping-separator*, *grouping-size*, *country*, and *language* traits are used to format the number into a string form, as specified in [XSLT]. This formatted number is used by the fo:page-number flow object.

*Constraints applicable to regions:*

There are a number of constraints that apply to all the regions that are specified within a given fo:simple-page-master.



If the block-progression-dimension of the properly stacked region-reference-area is greater than the block-progression-dimension of the region-viewport-area that is its parent, then the constraints on the relationship between the region-viewport-area and the region-reference-area depend on values of the *overflow* trait on the region-master and the kind of flows assigned to the region.

If all the flows assigned to the corresponding region are fo:static-content flow objects, then there is no constraint on the block-progression-dimension of the region-reference-area.

If all the flows assigned to the corresponding region are fo:flow formatting objects, then

- If the value of the *media-usage* trait is *paginate*, or the value of the *overflow* trait is *visible*, *hidden*, or *error-if-overflow*, then the block-progression-dimension of the region-reference-area is constrained to be no greater than the block-progression-dimension of the region-viewport-area.
- If the value of the *media-usage* trait is *bounded-in-one-dimension* or *unbounded*, and the value of the *overflow* trait is *scroll* or *auto*, then there is no constraint on the block-progression-dimension of the region-reference-area.

*Contents:*

([region-body+](#), [region-before?](#), [region-after?](#), [region-start?](#), [region-end?](#))

The following properties apply to this formatting object:


- [Common Margin Properties-Block](#) — § 7.11 on page 283


- “`master-name`” — § 7.27.8 on page 374
- “`page-height`” — § 7.27.13 on page 377
- “`page-width`” — § 7.27.15 on page 379
- “`reference-orientation`” — § 7.21.3 on page 349
- “`writing-mode`” — § 7.29.7 on page 401

#### 6.4.14. `fo:region-body`

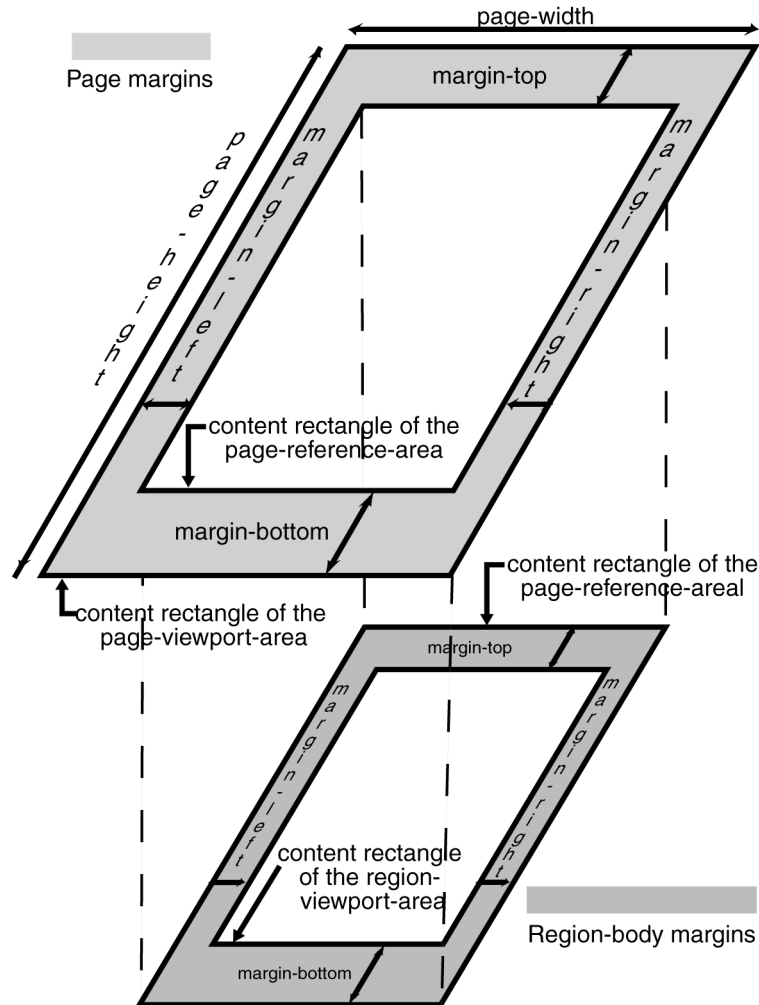
##### *Common Usage:*

Used in constructing a simple-page-master. This region specifies a viewport/reference pair that is located in the "center" of the `fo:simple-page-master`. The *overflow* trait controls how much of the underlying region-reference-area is visible; that is, whether the region-reference-area is clipped by its parent region-viewport-area.

 Typically, for paged media and when no explicit flow map is specified, the areas returned by the `fo:flow` formatting object in an `fo:page-sequence` are made to be descendants of a sequence of region-reference-areas that correspond to the region-body. These region-reference-areas are all area descendants of page-areas for which the page-master included an `fo:region-body`. If the `fo:flow` flow is assigned to some other region, then the areas returned by the `fo:flow` are constrained to be descendants of region-reference-areas generated using the assigned region-master.

 The body region should be sized and positioned within the `fo:simple-page-master` so that there is room for the areas returned by the flow that is assigned to the `fo:region-body` and for any desired side regions, that is, `fo:region-before`, `fo:region-after`, `fo:region-start` and `fo:region-end`'s that are to be placed on the same page. These side regions are positioned within the content-rectangle of the page-reference-area. The margins on the `fo:region-body` are used to position the region-viewport-area for the `fo:region-body` and to leave space for the other regions that surround the `fo:region-body`.





The spacing between the last four regions and the fo:region-body is determined by subtracting the relevant *extent* trait on the side regions from the trait that corresponds to the "margin-x" property on the fo:region-body.

The fo:region-body may be also be used to provide multiple columns. When the *column-count* trait is greater than one, then the region-body will be subdivided into multiple columns.

#### Areas:

The fo:region-body formatting object is used to generate one region-viewport-area and one region-reference-area whenever an fo:simple-page-master that has an fo:region-body as a child is used to generate a page. A scrolling mechanism shall be provided, in an implementation-defined manner, if the value of the *overflow* trait is "scroll".

The position and size of the region-viewport-area is specified relative to the content-rectangle of the page-reference-area generated by fo:simple-page-master. The content-rectangle of the region-viewport-area is indented from the content-rectangle of the page-reference-area by the values of the "margin-top", "margin-bottom", "margin-left" and "margin-right" properties. The values of the *padding* and *border-width* traits must be "0".

The region-reference-area generated using an fo:region-body is the child of the region-viewport-area. The "writing-mode" of the fo:region-body defines the column-progression within the region. The inline-

progression-direction is used to determine the stacking direction for columns (and the default flow order of text from column-to-column).

In addition to the viewport/reference pair, when the region-body is used to generate areas, at least one and up to three additional reference-areas are generated. These reference-areas are the optional *before-float-reference-area*, the optional *footnote-reference-area*, and the *main-reference-area*. The latter reference-area comprises the space left after space is borrowed for the other two reference-areas. The main-reference-area has no padding, border, or space associated with it.



If there is no before-float-reference-area or footnote-reference-area child of the region-reference-area, then the content-rectangle of the main-reference-area is coterminous with the content-rectangle of the region-reference-area.

The main-reference-area has as its children a sequence of *span-reference-areas*. These are reference-area block-areas with zero border and padding, whose inline-progression-dimension is equal to that of the main-reference-area, and which are normally stacked within the main-reference-area.

Each span-reference-area has one or more reference-area children, designated as *normal-flow-reference-areas*. The number and placement of the children of a span-reference-area depends on the *column-count* trait of the span-reference-area. In turn, the formatter must generate precisely enough of these span-reference-areas, and so set their *column-count* traits, that block-areas returned from the flows with a *span* of "all" are children of span-reference-areas with *column-count* equal to 1, and block-areas returned from the flows with a *span* of "none" are children of span-reference-areas with *column-count* equal to the refined value of the column-count property of the associated region-reference-area.

For each span-reference-area, the number  $N$  of normal-flow-reference-area children is equal to the value of the *column-count* trait.

It is an error to specify a *column-count* other than 1 if the "overflow" property has the value "scroll". An implementation may recover by behaving as if "1" had been specified.

The inline-progression-dimension of each of these normal-flow-reference-areas is determined by subtracting  $(N-1)$  times the column-gap trait from the inline-progression-dimension of the main-reference-area and dividing that result by  $N$ . Using "body-in-size" for the name of the inline-progression-dimension of the span-reference-area and "column-in-size" for the name of the size of the normal-flow-reference-areas in the inline-progression-direction, the formula is:

$$\text{column-in-size} = (\text{body-in-size} - (N - 1) * \text{column-gap}) / N$$


The block-progression-dimension of the normal-flow-reference-areas is the same as that of the parent span-reference-area.



As noted above, the block-progression-dimension of the span-reference-area may be less than the size of the region-reference-area if a before-float-reference-area or footnote-reference-area are present, or if there is more than one span-reference-area child of the main-reference-area.

The normal-flow-reference-areas are positioned within the span-reference-area as follows: The first column is positioned with the before-edge and start-edge of its content-rectangle coincident with the before-edge and start-edge of the content-rectangle of the span-reference-area. The content-rectangle of the  $J$ th normal-flow-reference-area child of the span-reference-area is positioned with its before-edge coincident with the before-edge of the content-rectangle of the span-reference-area and with its start-edge at  $((J-1) * (\text{column-in-size} + \text{column-gap}))$  in the inline-progression-direction. This results in the end-edge of

the content-rectangle of the *N*th normal-flow-reference-area being coincident with the end-edge of the content-rectangle of the span-reference-area.

 If the *writing-mode* is "rl-tb", the above description means that the columns are ordered from right-to-left as would be expected. This follows because the start-edge is on the right in an "rl-tb" writing-mode.

All areas generated by using the fo:region-body are of area-class "xsl-absolute".

#### *Trait Derivation:*

The *reference-orientation* and *writing-mode* of the region-viewport-area are determined by the formatting object that generates the area (see § 6.4.5 – fo:page-sequence on page 91). The *reference-orientation* of the region-reference-area is set to "0" and is, therefore, the same as the orientation established by the region-viewport-area. The *writing-mode* of the region-reference-area is set to the same value as that of the region-viewport-area.

The remaining traits on the region-viewport-area and region-reference-area are set according to the normal rules for determining the values of traits.

The traits on the span-reference-areas and on the normal-flow-reference-areas are determined in the same manner as described in § 5 – Property Refinement / Resolution on page 44.

#### *Constraints:*

The constraints applicable to all regions (see § 6.4.13 – fo:simple-page-master on page 98) all apply.

The inline-progression-dimension of the region-viewport-area is determined by the inline-progression-dimension of the content-rectangle of the page-reference-area minus the values of the *start-indent* and *end-indent* traits of the region-master. The start-edge and end-edge of the content-rectangle of the region-viewport-area are determined by the *reference-orientation* trait on the page-master.

The block-progression-dimension of the region-viewport-area is determined by the block-progression-dimension of the content-rectangle for the page-reference-area minus the values of the *space-before* and *space-after* traits of the region-master. The before-edge and after-edge of the content-rectangle of the region-viewport-area are determined by the *reference-orientation* trait on the page-master.

The values of the *space-before* and *start-indent* traits are used to position the region-viewport-area relative to the before-edge and start-edge of the content-rectangle of the page-reference-area.

The constraints on the size and position of the region-reference-area generated using the fo:region-body are covered in the "Constraints applicable to regions" section of § 6.4.13 – fo:simple-page-master on page 98.

#### *Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Margin Properties-Block](#) — § 7.11 on page 283
- "clip" — § 7.21.1 on page 347
- "column-count" — § 7.27.2 on page 371
- "column-gap" — § 7.27.3 on page 371
- "display-align" — § 7.14.4 on page 303
- "overflow" — § 7.21.2 on page 348

- “[region-name](#)” — § 7.27.17 on page 380
- “[reference-orientation](#)” — § 7.21.3 on page 349
- “[writing-mode](#)” — § 7.29.7 on page 401

### 6.4.15. [fo:region-before](#)

#### *Common Usage:*

Used in constructing a simple-page-master. This region specifies a viewport/reference pair that is located on the "before" side of the page-reference-area. In lr-tb writing-mode, this region corresponds to the header region. The *overflow* trait controls how much of the underlying region-reference-area is visible; that is, whether the region-reference-area is clipped by its parent region-viewport-area.

#### *Areas:*

The [fo:region-before](#) formatting object is used to generate one region-viewport-area and one region-reference-area.

The values of the *padding* and *border-width* traits must be "0".

The before-edge of the content-rectangle of this region-viewport-area is positioned coincident with the before-edge of the content-rectangle of the page-reference-area generated using the parent [fo:simple-page-master](#). The block-progression-dimension of the region-viewport-area is determined by the *extent* trait on the [fo:region-before](#) formatting object.

The inline-progression-dimension of the region-viewport-area is determined by the *precedence* trait on the [fo:region-before](#). If the value of the *precedence* trait is *true*, then the inline-progression-dimension extends up to the start-edge and end-edge of the content-rectangle of the page-reference-area. In this case, the region-before region-viewport-area acts like a float into areas generated by the region-start and region-end. If the value of the *precedence* trait on the [fo:region-before](#) is *false*, then these adjacent regions float into the area generated by the [fo:region-before](#) and the extent of the [fo:region-before](#) is (effectively) reduced by the incursions of the adjacent regions.

The region-reference-area lies on a canvas underneath the region-viewport-area.

The size of the region-reference-area depends on the setting of the *overflow* trait on the region. If the value of that trait is "auto", "hidden", "error-if-overflow", "paginate", or "visible" then the size of the reference-area is the same as the size of the viewport. If the value of the *overflow* trait is "scroll", the size of the reference-area is equal to the size of the viewport in the inline-progression-direction in the *writing-mode* for the region and has no constraint in the block-progression-direction (which implies that it grows to hold the distribution of all the content bound to the region).

#### *Trait Derivation:*

The *reference-orientation* and *writing-mode* of the region-viewport-area are determined by the formatting object that generates the area (see § 6.4.5 – [fo:page-sequence](#) on page 91). The *reference-orientation* of the region-reference-area is set to "0" and is, therefore, the same as the orientation established by the region-viewport-area. The *writing-mode* of the region-reference-area is set to the same value as that of the region-viewport-area.

The remaining traits on the region-viewport-area and region-reference-area are set according to the normal rules for determining the values of traits.

*Constraints:*

The constraints on the size and position of the region-reference-area generated using the `fo:region-before` are covered in the "Constraints applicable to regions" section of § 6.4.13 – `fo:simple-page-master` on page 98.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- `“clip”` — § 7.21.1 on page 347
- `“display-align”` — § 7.14.4 on page 303
- `“extent”` — § 7.27.4 on page 371
- `“overflow”` — § 7.21.2 on page 348
- `“precedence”` — § 7.27.16 on page 379
- `“region-name”` — § 7.27.17 on page 380
- `“reference-orientation”` — § 7.21.3 on page 349
- `“writing-mode”` — § 7.29.7 on page 401

### 6.4.16. `fo:region-after`

*Common Usage:*

Used in constructing a simple-page-master. This region specifies a viewport/reference pair that is located on the "after" side of the page-reference-area. In lr-tb writing-mode, this region corresponds to the footer region. The *overflow* trait controls how much of the underlying region-reference-area is visible; that is, whether the region-reference-area is clipped by its parent region-viewport-area.

*Areas:*

The `fo:region-after` formatting object is used to generate one region-viewport-area and one region-reference-area.

The values of the *padding* and *border-width* traits must be "0".

The after-edge of the content-rectangle of this region-viewport-area is positioned coincident with the after-edge of the content-rectangle of the page-reference-area generated using the parent `fo:simple-page-master`. The block-progression-dimension of the region-viewport-area is determined by the *extent* trait on the `fo:region-after` formatting object.

The inline-progression-dimension of the region-viewport-area is determined by the *precedence* trait on the `fo:region-after`. If the value of the *precedence* trait is *true*, then the inline-progression-dimension extends up to the start-edge and end-edge of the content-rectangle of the page-reference-area. In this case, the region-after region-viewport-area acts like a float into areas generated by the region-start and region-end. If the value of the *precedence* trait on the `fo:region-after` is *false*, then these adjacent regions float into the area generated by the `fo:region-after` and the extent of the `fo:region-after` is (effectively) reduced by the incursions of the adjacent regions.

The region-reference-area lies on a canvas underneath the region-viewport-area.

The size of the region-reference-area depends on the setting of the *overflow* trait on the region. If the value of that trait is "auto", "hidden", "error-if-overflow", "paginate", or "visible" then the size of the reference-area is the same as the size of the viewport. If the value of the *overflow* trait is "scroll", the size of

the reference-area is equal to the size of the viewport in the inline-progression-direction in the *writing-mode* for the region and has no constraint in the block-progression-direction (which implies that it grows to hold the distribution of all the content bound to the region).

*Trait Derivation:*

The *reference-orientation* and *writing-mode* of the region-viewport-area are determined by the formatting object that generates the area (see § 6.4.5 – [fo:page-sequence](#) on page 91). The *reference-orientation* of the region-reference-area is set to "0" and is, therefore, the same as the orientation established by the region-viewport-area. The *writing-mode* of the region-reference-area is set to the same value as that of the region-viewport-area.

The remaining traits on the region-viewport-area and region-reference-area are set according to the normal rules for determining the values of traits.

*Constraints:*

The constraints on the size and position of the region-reference-area generated using the `fo:region-after` are covered in the "Constraints applicable to regions" section of § 6.4.13 – [fo:simple-page-master](#) on page 98.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- “clip” — § 7.21.1 on page 347
- “display-align” — § 7.14.4 on page 303
- “extent” — § 7.27.4 on page 371
- “overflow” — § 7.21.2 on page 348
- “precedence” — § 7.27.16 on page 379
- “region-name” — § 7.27.17 on page 380
- “reference-orientation” — § 7.21.3 on page 349
- “writing-mode” — § 7.29.7 on page 401

### 6.4.17. `fo:region-start`

*Common Usage:*

Used in constructing a simple-page-master. This region specifies a viewport/reference pair that is located on the "start" side of the page-reference-area. In lr-tb writing-mode, this region corresponds to a left sidebar. The *overflow* trait controls how much of the underlying region-reference-area is visible; that is, whether the region-reference-area is clipped by its parent region-viewport-area.

*Areas:*

The `fo:region-start` formatting object is used to generate one region-viewport-area and one region-reference-area.

The values of the *padding* and *border-width* traits must be "0".

The start-edge of the content-rectangle of this region-viewport-area is positioned coincident with the start-edge of the content-rectangle of the page-reference-area generated using the parent `fo:simple-page-master`. The inline-progression-dimension of the region-viewport-area is determined by the *extent* trait on the `fo:region-start` formatting object.

The block-progression-dimension of the region-viewport-area is determined by the *precedence* trait on the adjacent fo:region-before and the fo:region-after, if these exist; otherwise it is determined as if the value of the *precedence* trait was *false*. If the value of the *precedence* trait of the fo:region-before (or, respectively, fo:region-after) is *false*, then the block-progression-dimension extends up to the before- (or, respectively, after-) edge of the content-rectangle of the page-reference-area. In this case, the region-start acts like a float into areas generated by the region-before (respectively, the region-after). If the value of the *precedence* trait on the adjacent regions is *true*, then these adjacent regions float into the area generated by the fo:region-start and the extent of the fo:region-start is (effectively) reduced by the incursions of the adjacent regions with the value of the *precedence* trait equal to *true*.

The region-reference-area lies on a canvas underneath the region-viewport-area.

The size of the region-reference-area depends on the setting of the *overflow* trait on the region. If the value of that trait is "auto", "hidden", "error-if-overflow", "paginate", or "visible" then the size of the reference-area is the same as the size of the viewport. If the value of the *overflow* trait is "scroll", the size of the reference-area is equal to the size of the viewport in the inline-progression-direction in the *writing-mode* for the region and has no constraint in the block-progression-direction (which implies that it grows to hold the distribution of all the content bound to the region).

*Trait Derivation:*

The *reference-orientation* and *writing-mode* of the region-viewport-area are determined by the formatting object that generates the area (see § 6.4.5 – fo:page-sequence on page 91). The *reference-orientation* of the region-reference-area is set to "0" and is, therefore, the same as the orientation established by the region-viewport-area. The *writing-mode* of the region-reference-area is set to the same value as that of the region-viewport-area.

The remaining traits on the region-viewport-area and region-reference-area are set according to the normal rules for determining the values of traits.

*Constraints:*

The constraints on the size and position of the region-reference-area generated using the fo:region-start are covered in the "Constraints applicable to regions" section of § 6.4.13 – fo:simple-page-master on page 98.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [“clip”](#) — § 7.21.1 on page 347
- [“display-align”](#) — § 7.14.4 on page 303
- [“extent”](#) — § 7.27.4 on page 371
- [“overflow”](#) — § 7.21.2 on page 348
- [“region-name”](#) — § 7.27.17 on page 380
- [“reference-orientation”](#) — § 7.21.3 on page 349
- [“writing-mode”](#) — § 7.29.7 on page 401

### 6.4.18. fo:region-end

#### Common Usage:

Used in constructing a simple-page-master. This region specifies a viewport/reference pair that is located on the "end" side of the page-reference-area. In lr-tb writing-mode, this region corresponds to a right sidebar. The *overflow* trait controls how much of the underlying region-reference-area is visible; that is, whether the region-reference-area is clipped by its parent region-viewport-area.

#### Areas:

The fo:region-end formatting object is used to generate one region-viewport-area and one region-reference-area.

The values of the *padding* and *border-width* traits must be "0".

The end-edge of the content-rectangle of this region-viewport-area is positioned coincident with the end-edge of the content-rectangle of the page-reference-area generated using the parent fo:simple-page-master. The inline-progression-dimension of the region-viewport-area is determined by the *extent* trait on the fo:region-end formatting object.

The block-progression-dimension of the region-viewport-area is determined by the *precedence* trait on the adjacent fo:region-before and the fo:region-after, if these exist; otherwise it is determined as if the value of the *precedence* trait was *false*. If the value of the *precedence* trait of the fo:region-before (or, respectively, fo:region-after) is *false*, then the block-progression-dimension extends up to the before- (or, respectively, after-) edge of the content-rectangle of the page-reference-area. In this case, the region-end acts like a float into areas generated by the region-before (respectively, the region-after). If the value of the *precedence* trait on the adjacent regions is *true*, then these adjacent regions float into the area generated by the fo:region-end and the extent of the fo:region-end is (effectively) reduced by the incursions of the adjacent regions with the value of the *precedence* trait equal to *true*.

The region-reference-area lies on a canvas underneath the region-viewport-area.

The size of the region-reference-area depends on the setting of the *overflow* trait on the region. If the value of that trait is "auto", "hidden", "error-if-overflow", "paginate", or "visible" then the size of the reference-area is the same as the size of the viewport. If the value of the *overflow* trait is "scroll", the size of the reference-area is equal to the size of the viewport in the inline-progression-direction in the *writing-mode* for the region and has no constraint in the block-progression-direction (which implies that it grows to hold the distribution of all the content bound to the region).

#### Trait Derivation:

The *reference-orientation* and *writing-mode* of the region-viewport-area are determined by the formatting object that generates the area (see § 6.4.5 – fo:page-sequence on page 91). The *reference-orientation* of the region-reference-area is set to "0" and is, therefore, the same as the orientation established by the region-viewport-area. The *writing-mode* of the region-reference-area is set to the same value as that of the region-viewport-area.

The remaining traits on the region-viewport-area and region-reference-area are set according to the normal rules for determining the values of traits.

#### Constraints:

The constraints on the size and position of the region-reference-area generated using the fo:region-end are covered in the "Constraints applicable to regions" section of § 6.4.13 – fo:simple-page-master on page 98.



*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [“clip”](#) — § 7.21.1 on page 347
- [“display-align”](#) — § 7.14.4 on page 303
- [“extent”](#) — § 7.27.4 on page 371
- [“overflow”](#) — § 7.21.2 on page 348
- [“region-name”](#) — § 7.27.17 on page 380
- [“reference-orientation”](#) — § 7.21.3 on page 349
- [“writing-mode”](#) — § 7.29.7 on page 401

**6.4.19. fo:flow***Common Usage:*

The content of the fo:flow formatting object is a sequence of flow objects that provides the flowing text content that is distributed into pages.

*Areas:*

The fo:flow formatting object does not generate any areas. The fo:flow formatting object returns a sequence of areas created by concatenating the sequences of areas returned by each of the children of the fo:flow. The order of concatenation is the same order as the children are ordered under the fo:flow.

*Constraints:*

The flow-map determines the assignment of the content of the fo:flow to a region.

*Contents:*`(%block;)+`

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [“id”](#) — § 7.30.8 on page 409
- [“index-class”](#) — § 7.24.1 on page 362
- [“index-key”](#) — § 7.24.2 on page 363
- [“flow-name”](#) — § 7.27.5 on page 372

**6.4.20. fo:static-content***Common Usage:*

The fo:static-content formatting object holds a sequence or a tree of formatting objects that is to be presented in a single region or repeated in like-named regions on one or more pages in the page-sequence. Its common use is for repeating or running headers and footers.

This content is repeated, in its entirety, on every page to which it is assigned.

*Areas:*

The fo:static-content formatting object does not generate any areas. The fo:static-content formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of

the children of the fo:static-content. The order of concatenation is the same order as the children are ordered under the fo:static-content.

*Constraints:*

The flow-map determines the assignment of the content of the fo:static-content to a region.

The fo:static-content may be processed multiple times and thus the default ordering constraint of section § 4.7.1 – [General Ordering Constraints](#) on page 38 does not apply to the fo:static-content. Instead, it must satisfy the constraint on a per-page basis. Specifically, if *P* is a page-reference-area, *C* is an area-class, and *S* is the set of all descendants of *P* of area-class *C* returned to the fo:static-content descendant, then *S* must be properly ordered.

*Contents:*

(%block;)+

*The following properties apply to this formatting object:*

- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “flow-name” — § 7.27.5 on page 372

### 6.4.21. fo:title

*Common Usage:*

The fo:title formatting object is used to associate a title with a given page-sequence. This title may be used by an interactive User Agent to identify the pages. For example, the content of the fo:title can be formatted and displayed in a "title" window or in a "tool tip".

*Areas:*

This formatting object returns the sequence of areas returned by the children of this formatting object.

*Constraints:*

The sequence of returned areas must be the concatenation of the sub-sequences of areas returned by each of the flow children of the fo:title formatting object in the order in which the children occur.

*Contents:*

(#PCDATA|%inline;)\*

An fo:title is not permitted to have an fo:float, fo:footnote or fo:marker as a descendant.

Additionally, an fo:title is not permitted to have as a descendant an fo:block-container that generates an absolutely positioned area.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Font Properties](#) — § 7.9 on page 268
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- “color” — § 7.18.1 on page 335
- “line-height” — § 7.16.4 on page 319

- “visibility” — § 7.30.17 on page 413

## 6.4.22. fo:flow-map


*Common Usage:*

The fo:flow-map is used to specify the assignment of flows to regions.

*Areas:*

The fo:flow-map formatting object generates no area directly. It is used by the fo:page-sequence formatting object to assign flows to regions.

Each fo:flow-assignment child of the fo:flow map defines a source list and a target list. The source list is a sequence of flow names whose corresponding fo:flow objects (in the referring fo:page-sequence) are treated as a single fo:flow for composition purposes. The target list is a sequence of region-names which identify the region or regions on each page which are used for the source content.

 This is independent of the actual sequence of pages, which is generated as it has always been generated using the fo:simple-page-master, and fo:page-sequence-master objects referred to by the master-reference property of the fo:page-sequence.

For each fo:flow-assignment child of the fo:flow-map, having an fo:flow-source-list child S and an fo:flow-target-list child T, we say that the fo:flow-map *assigns* each of the flows referenced by the fo:flow-name-specifier children of S to the regions referenced by the fo:region-name-specifier children of T.

*Constraints:*

Many of the constraints that a flow-map induces are expressed in § 6.4.5 – fo:page-sequence on page 91.

The children of the fo:flow-map are fo:flow-assignment objects containing parallel constraints for assigning flows to regions. It is an error for a flow-name to appear in the source list of more than one fo:flow-assignment child of a given fo:flow-map. It is also an error for a region-name to appear in the target list of more than one fo:flow-assignment child of a given fo:flow-map.

**Implicit flow-map:**

```
<fo:flow-map>
  <fo:flow-assignment>
    <fo:flow-source-list>
      <fo:flow-name-specifier
        flow-name-reference="xsl-region-body" />
    </fo:flow-source-list>
    <fo:flow-target-list>
      <fo:region-name-specifier
        region-name-reference="xsl-region-body" />
    </fo:flow-target-list>
  </fo:flow-assignment>
  <fo:flow-assignment>
    <fo:flow-source-list>
      <fo:flow-name-specifier
        flow-name-reference="xsl-region-before" />
```

```

</fo:flow-source-list>
<fo:flow-target-list>
  <fo:region-name-specifier
    region-name-reference="xsl-region-before"/>
</fo:flow-target-list>
</fo:flow-assignment>
<fo:flow-assignment>
  <fo:flow-source-list>
    <fo:flow-name-specifier
      flow-name-reference="xsl-region-after"/>
  </fo:flow-source-list>
  <fo:flow-target-list>
    <fo:region-name-specifier
      region-name-reference="xsl-region-after"/>
  </fo:flow-target-list>
</fo:flow-assignment>
<fo:flow-assignment>
  <fo:flow-source-list>
    <fo:flow-name-specifier
      flow-name-reference="xsl-region-start"/>
  </fo:flow-source-list>
  <fo:flow-target-list>
    <fo:region-name-specifier
      region-name-reference="xsl-region-start"/>
  </fo:flow-target-list>
</fo:flow-assignment>
<fo:flow-assignment>
  <fo:flow-source-list>
    <fo:flow-name-specifier
      flow-name-reference="xsl-region-end"/>
  </fo:flow-source-list>
  <fo:flow-target-list>
    <fo:region-name-specifier
      region-name-reference="xsl-region-end"/>
  </fo:flow-target-list>
</fo:flow-assignment>
</fo:flow-map>

```

**Contents:**

(flow-assignment+)

*The following properties apply to this formatting object:*

- “[flow-map-name](#)” — § 7.27.18 on page 381

### 6.4.23. fo:flow-assignment

#### *Common Usage:*

The fo:flow-assignment is used to specify the assignment of one sequence of flows to a sequence of regions.

#### *Areas:*

The fo:flow-assignment formatting object generates no area directly. It is used by the fo:page-sequence formatting object to assign flows to regions.

#### *Constraints:*

The children of the fo:flow-assignment are a source-list and target-list containing constraints for assigning one sequence of flows to a sequence of regions.

#### *Contents:*

(flow-source-list, flow-target-list)

### 6.4.24. fo:flow-source-list

#### *Common Usage:*

The fo:flow-source-list is used to specify the sequence of flows to assign in a particular fo:flow-assignment.

#### *Areas:*

The fo:flow-source-list formatting object generates no area directly. It is used by the fo:page-sequence formatting object to assign flows to regions.

#### *Constraints:*

The children of the fo:flow-source-list are a sequence of flow-name-specifiers identifying flows of the sequence. These flows must be either all fo:flow formatting objects or all fo:static-content formatting objects. It is an error if they are a mixture.

#### *Contents:*

(flow-name-specifier+)

### 6.4.25. fo:flow-name-specifier

#### *Common Usage:*

The fo:flow-name-specifier is used to specify one flow in a source-list.

#### *Areas:*

The fo:flow-name-specifier formatting object generates no area directly. It is used by the fo:page-sequence formatting object to assign flows to regions.

#### *Constraints:*

The flow-name-reference property specifies the name of a flow in the source sequence.

#### *Contents:*

EMPTY

*The following properties apply to this formatting object:*

- “[flow-name-reference](#)” — § 7.27.20 on page 381

### 6.4.26. fo:flow-target-list

*Common Usage:*

The fo:flow-target-list is used to specify the sequence of regions to which flows are assigned in a particular fo:flow-assignment.

*Areas:*

The fo:flow-target-list formatting object generates no area directly. It is used by the fo:page-sequence formatting object to assign flows to regions.

*Constraints:*

The children of the fo:flow-target-list are a sequence of region-name-specifiers identifying regions in the sequence.

*Contents:*

([region-name-specifier](#)+) )

### 6.4.27. fo:region-name-specifier

*Common Usage:*

The fo:region-name-specifier is used to specify one region in a target-list.

*Areas:*

The fo:region-name-specifier formatting object generates no area directly. It is used by the fo:page-sequence formatting object to assign flows to regions.

*Constraints:*

The region-name-reference property specifies the name of a region in the target sequence.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- “[region-name-reference](#)” — § 7.27.21 on page 382

## 6.5. Block-level Formatting Objects

### 6.5.1. Introduction

The fo:block formatting object is used for formatting paragraphs, titles, figure captions, table titles, etc. The following example illustrates the usage of fo:block in a stylesheet.

#### 6.5.1.1. Example

The following example shows the use of fo:block for chapter and section titles, and paragraphs.

Input sample:

```
<doc>
  <chapter>
    <title>Chapter title</title>
    <section>
      <title>First section title</title>
      <paragraph>Section one's first paragraph.</paragraph>
      <paragraph>Section one's second paragraph.</paragraph>
    </section>
    <section>
      <title>Second section title</title>
      <paragraph>Section two's only paragraph.</paragraph>
    </section>
  </chapter>
</doc>
```

In this example the chapter title appears at the top of the page (its "space-before" is discarded).

Space between chapter title and first section title is (8pt,8pt,8pt): the chapter title's "space-after" has a higher precedence than the section title's "space-before" (which takes on the initial value of zero), so the latter is discarded.

Space between the first section title and section one's first paragraph is (6pt,6pt,6pt): the section title's "space-after" has higher precedence than the paragraph's "space-before", so the latter is discarded.

Space between the two paragraphs is (6pt,8pt,10pt): the "space-after" the first paragraph is discarded because its precedence is equal to that of the "space-before" the next paragraph, and the optimum of the "space-after" of the first paragraph is greater than the optimum of the "space-before" of the second paragraph.

Space between the second paragraph of the first section and the title of the second section is (12pt,12pt,12pt): the "space-after" the paragraph is discarded because its precedence is equal to that of the "space-before" of the section title, and the optimum of the "space-after" of the paragraph is less than the optimum of the "space-before" of the section title.

The indent on the first line of the first paragraph in section one and the only paragraph in section two is zero; the indent on the first line of the second paragraph in section one is 2pc.

XSL Stylesheet:

```
<?xml version="1.0" encoding="utf-8"?>
<xsl:stylesheet
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:fo="http://www.w3.org/1999/XSL/Format">

  <xsl:template match="chapter">
    <fo:block break-before="page">
      <xsl:apply-templates/>
    </fo:block>
  </xsl:template>
```

```

<xsl:template match="chapter/title">
  <fo:block text-align="center" space-after="8pt"
            space-before="16pt" space-after.precedence="3">
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="section">
  <xsl:apply-templates/>
</xsl:template>

<xsl:template match="section/title">
  <fo:block text-align="center" space-after="6pt"
            space-before="12pt" space-before.precedence="0"
            space-after.precedence="3">
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="paragraph[1]" priority="1">
  <fo:block text-indent="0pc" space-after="7pt"
            space-before.minimum="6pt" space-before.optimum="8pt"
            space-before.maximum="10pt">
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="paragraph">
  <fo:block text-indent="2pc" space-after="7pt"
            space-before.minimum="6pt" space-before.optimum="8pt"
            space-before.maximum="10pt">
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

</xsl:stylesheet>

```

Result Instance: elements and attributes in the fo: namespace

```

<fo:block break-before="page">

  <fo:block text-align="center" space-after="8pt"
            space-before="16pt"
            space-after.precedence="3">Chapter title
  </fo:block>

```



```

<fo:block text-align="center" space-after="6pt"
  space-before="12pt" space-before.precedence="0"
  space-after.precedence="3">First section title
</fo:block>

<fo:block text-indent="0pc" space-after="7pt"
  space-before.minimum="6pt" space-before.optimum="8pt"
  space-before.maximum="10pt">Section one's first paragraph.
</fo:block>

<fo:block text-indent="2pc" space-after="7pt"
  space-before.minimum="6pt" space-before.optimum="8pt"
  space-before.maximum="10pt">Section one's second paragraph.
</fo:block>

<fo:block text-align="center" space-after="6pt"
  space-before="12pt" space-before.precedence="0"
  space-after.precedence="3">Second section title
</fo:block>

<fo:block text-indent="0pc" space-after="7pt"
  space-before.minimum="6pt" space-before.optimum="8pt"
  space-before.maximum="10pt">Section two's only paragraph.
</fo:block>

</fo:block>

```

### 6.5.2. fo:block

#### *Common Usage:*

The fo:block formatting object is commonly used for formatting paragraphs, titles, headlines, figure and table captions, etc.

#### *Areas:*

The fo:block formatting object generates one or more *normal* block-areas. The fo:block returns these areas, any *page-level-out-of-line* areas, and any *reference-level-out-of-line* areas returned by the children of the fo:block. The fo:block also generates zero or more line-areas as children of the normal block-areas it returns, in accordance with § 4.7.2 – [Line-building](#) on page 38.

#### *Trait Derivation:*

The .minimum, .optimum, and .maximum components of the *half-leading* trait are set to 1/2 the difference of the computed value of the *line-height* property and the computed value of the sum of the *text-altitude* and *text-depth* properties. The .precedence and .conditionality components are copied from the *line-height* property.



The usage of the half-leading is described in § 4.5 – [Line-areas](#) on page 35.

*Constraints:*

No area may have more than one normal child area returned by the same fo:block formatting object.

The children of each normal area generated by an fo:block must satisfy the constraints specified in § 4.7.2 – [Line-building](#) on page 38.

In addition the constraints imposed by the traits derived from the properties applicable to this formatting object must be satisfied. The geometric constraints are rigorously defined in § 4 – [Area Model](#) on page 15.

*Contents:*

```
(#PCDATA|%inline;|%block;)*
```

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children, optionally followed by an fo:initial-property-set.

*The following properties apply to this formatting object:*


- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Font Properties](#) — § 7.9 on page 268
- [Common Hyphenation Properties](#) — § 7.10 on page 280
- [Common Margin Properties-Block](#) — § 7.11 on page 283
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “break-after” — § 7.20.1 on page 343
- “break-before” — § 7.20.2 on page 344
- “clear” — § 7.19.1 on page 337
- “color” — § 7.18.1 on page 335
- “text-depth” — § 7.29.5 on page 399
- “text-altitude” — § 7.29.4 on page 399
- “hyphenation-keep” — § 7.16.1 on page 318
- “hyphenation-ladder-count” — § 7.16.2 on page 318
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “intrusion-displace” — § 7.19.3 on page 342
- “keep-together” — § 7.20.3 on page 344
- “keep-with-next” — § 7.20.4 on page 345
- “keep-with-previous” — § 7.20.5 on page 346
- “last-line-end-indent” — § 7.16.3 on page 319
- “linefeed-treatment” — § 7.16.7 on page 322
- “line-height” — § 7.16.4 on page 319
- “line-height-shift-adjustment” — § 7.16.5 on page 321
- “line-stacking-strategy” — § 7.16.6 on page 321
- “orphans” — § 7.20.6 on page 346
- “white-space-treatment” — § 7.16.8 on page 323
- “span” — § 7.21.4 on page 350
- “text-align” — § 7.16.9 on page 323
- “text-align-last” — § 7.16.10 on page 325
- “text-indent” — § 7.16.11 on page 326

- “visibility” — § 7.30.17 on page 413
- “white-space-collapse” — § 7.16.12 on page 327
- “widows” — § 7.20.7 on page 347
- “wrap-option” — § 7.16.13 on page 327

### 6.5.3. fo:block-container


#### *Common Usage:*

The fo:block-container flow object is used to generate a block-level reference-area, typically containing text blocks with a different writing-mode. In addition, it can also be used with a different reference-orientation to rotate its content.

 The use of this flow object is not required for changing the inline-progression-direction only; in that case the Unicode BIDI algorithm and the fo:bidi-override are sufficient.

#### *Areas:*


The fo:block-container formatting object generates one or more viewport/reference pairs. All generated viewport-areas are subject to the constraints given by the block-progression-dimension and inline-progression-dimension traits of the fo:block-container. The fo:block-container returns these areas and any page-level-out-of-line areas returned by the children of the fo:block-container.

 In the case that the block-progression-dimension.maximum is other than "auto", then overflow processing may apply. The "repeat" value of overflow can be used to generate multiple viewport/reference pairs if this is desired rather than clipping or scrolling.

If the absolute-position trait is "auto", these areas all have an area-class of "xsl-normal". If the absolute-position trait is "absolute" or "fixed" then there is one viewport/reference pair, and its area-class is "xsl-absolute" or "xsl-fixed", respectively.

#### *Trait Derivation:*

The reference-orientation and writing-mode traits of the viewport-area and reference-area come from the fo:block-container. These determine the orientation of the start-edge, end-edge, before-edge and after-edge of the content-rectangle of the viewport-area, and of the padding-, border-, and content-rectangles of the reference-area. The *reference-orientation* of the reference-area is set to "0" and is, therefore, the same as the orientation established by the viewport-area. The inline-progression-dimension of the reference-area is the same as that of the viewport-area, and may not be "auto" if the inline-progression-direction is different from that of the parent of the fo:block-container. The block-progression-dimension of the reference-area is not constrained; thus the reference-area may be larger than the viewport-area and this may cause the "overflow" property to operate.

 As a property value applies to each of the areas generated by this flow object the size can vary from instance to instance if the value is "auto" or a <length-range>.

#### *Constraints:*

The children of each reference-area generated by an fo:block-container formatting object must be normal *block-areas* returned by the children of the fo:block-container, must be *properly stacked*, and must be *properly ordered*.

Any *reference-level-out-of-line* areas returned by the children of the fo:block-container are handled as described in § 6.12.2 – fo:float on page 214.

*Contents:*

(%block;)+

In addition an fo:block-container that does not generate an *absolutely positioned* area may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- Common Absolute Position Properties — § 7.6 on page 239
- Common Border, Padding, and Background Properties — § 7.8 on page 248
- Common Margin Properties-Block — § 7.11 on page 283
- “block-progression-dimension” — § 7.15.3 on page 308
- “break-after” — § 7.20.1 on page 343
- “break-before” — § 7.20.2 on page 344
- “clear” — § 7.19.1 on page 337
- “clip” — § 7.21.1 on page 347
- “display-align” — § 7.14.4 on page 303
- “height” — § 7.15.6 on page 311
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “inline-progression-dimension” — § 7.15.7 on page 312
- “intrusion-displace” — § 7.19.3 on page 342
- “keep-together” — § 7.20.3 on page 344
- “keep-with-next” — § 7.20.4 on page 345
- “keep-with-previous” — § 7.20.5 on page 346
- “overflow” — § 7.21.2 on page 348
- “reference-orientation” — § 7.21.3 on page 349
- “span” — § 7.21.4 on page 350
- “width” — § 7.15.14 on page 317
- “writing-mode” — § 7.29.7 on page 401
- “z-index” — § 7.30.18 on page 414

## 6.6. Inline-level Formatting Objects

### 6.6.1. Introduction

Inline-level formatting objects are most commonly used to format a portion of text or for generating rules and leaders. There are many other uses. The following examples illustrate some of these uses of inline-level formatting objects.

- putting the first line of a paragraph into small-caps,
- turning a normally inline formatting object, fo:external-graphic, into a block by "wrapping" with an fo:block formatting object,
- formatting a running footer containing the word "Page" followed by a page number.

### 6.6.1.1. Examples

#### 6.6.1.1.1. First Line of Paragraph in Small-caps

Input sample:

```
<doc>
<p>This is the text of a paragraph that is going to be
presented with the first line in small-caps.</p>
</doc>
```

XSL Stylesheet:

```
<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                xmlns:fo="http://www.w3.org/1999/XSL/Format"
                version='1.0'>

<xsl:template match="p">
  <fo:block>
    <fo:initial-property-set font-variant="small-caps"/>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

</xsl:stylesheet>
```

Result instance: elements and attributes in the fo: namespace

```
<fo:block>
  <fo:initial-property-set font-variant="small-caps">
  </fo:initial-property-set>This is the text of a paragraph that is going to be
presented with the first line in small-caps.
</fo:block>
```

#### 6.6.1.1.2. Figure with a Photograph

Input sample:

```
<doc>
  <figure>
    <photo image="TH0317A.jpg"/>
    <caption>C'ien Tamlung of C'ien Mai</caption>
  </figure>
</doc>
```

In this example the image (an fo:external-graphic) is placed as a centered block-level object. The caption is centered with 10mm indents.

XSL Stylesheet:

```
<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
```

```

        xmlns:fo="http://www.w3.org/1999/XSL/Format"
        version='1.0'>

<xsl:template match="figure">
  <fo:block>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="photo">
  <fo:block text-align="center">
    <fo:external-graphic src="'url({@image})'"/>
  </fo:block>
</xsl:template>

<xsl:template match="caption">
  <fo:block space-before="3pt" text-align="center"
    start-indent="10mm" end-indent="10mm">
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

</xsl:stylesheet>

```

fo: element and attribute tree:

```

<fo:block>
  <fo:block text-align="center">
    <fo:external-graphic src="'url(TH0317A.jpg)'" />
  </fo:block>

  <fo:block space-before="3pt" text-align="center" start-indent="10mm"
    end-indent="10mm">C'ienng Tamlung of C'ienng Mai</fo:block>
</fo:block>

```

### 6.6.1.1.3. Page numbering and page number reference

Input sample:

```

<!DOCTYPE doc SYSTEM "pgref.dtd">
<doc>
  <chapter id="x"><title>Chapter</title>
    <p>Text</p>
  </chapter>
  <chapter><title>Chapter</title>
    <p>For a description of X see <ref refid="x"/>.</p>
  </chapter>
</doc>

```

In this example each page has a running footer containing the word "Page" followed by the page number. The "ref" element generates the word "page" followed by the page number of the page on which the referenced by the "refid" attribute was placed.

XSL Stylesheet:

```
<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                xmlns:fo="http://www.w3.org/1999/XSL/Format"
                version='1.0'>

<xsl:template match="doc">
  <fo:root>
    <fo:layout-master-set>
      <fo:simple-page-master master-name="page"
        page-height="297mm" page-width="210mm"
        margin-top="20mm" margin-bottom="10mm"
        margin-left="25mm" margin-right="25mm">
        <fo:region-body
          margin-top="0mm" margin-bottom="15mm"
          margin-left="0mm" margin-right="0mm"/>
        <fo:region-after extent="10mm"/>
      </fo:simple-page-master>
    </fo:layout-master-set>
    <fo:page-sequence master-reference="page">
      <fo:static-content flow-name="xsl-region-after">
        <fo:block>
          <xsl:text>Page </xsl:text>
          <fo:page-number/>
        </fo:block>
      </fo:static-content>
      <fo:flow flow-name="xsl-region-body">
        <xsl:apply-templates/>
      </fo:flow>
    </fo:page-sequence>
  </fo:root>
</xsl:template>

<xsl:template match="chapter/title">
  <fo:block id="{generate-id(.)}">
    <xsl:number level="multiple" count="chapter" format="1. "/>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="p">
```

```

<fo:block>
  <xsl:apply-templates/>
</fo:block>
</xsl:template>

<xsl:template match="ref">
  <xsl:text>page </xsl:text>
  <fo:page-number-citation refid="{generate-id(id(@refid)/title)}"/>
</xsl:template>

</xsl:stylesheet>

```

### Result Instance: elements and attributes in the fo: namespace

```

<fo:root>
  <fo:layout-master-set>
    <fo:simple-page-master master-name="page"
      page-height="297mm" page-width="210mm"
      margin-top="20mm" margin-bottom="10mm"
      margin-left="25mm" margin-right="25mm">
      <fo:region-body margin-top="0mm" margin-bottom="15mm"
        margin-left="0mm" margin-right="0mm"/>
      <fo:region-after extent="10mm"/>
    </fo:simple-page-master>
  </fo:layout-master-set>
  <fo:page-sequence master-reference="page">
    <fo:static-content flow-name="xsl-region-after">
      <fo:block>Page <fo:page-number/>
    </fo:block>
  </fo:static-content>
  <fo:flow flow-name="xsl-region-body">
    <fo:block id="N5">1. Chapter</fo:block>
    <fo:block>Text</fo:block>
    <fo:block id="N13">2. Chapter</fo:block>
    <fo:block>For a description of X see page <fo:page-number-citation
refid="N5"/>
  </fo:block>
  </fo:flow>
</fo:page-sequence>
</fo:root>

```

#### 6.6.1.1.4. Table of Contents with Leaders

Input sample:

```

<doc>
  <chapter><title>Chapter</title>
  <p>Text</p>

```



```

    <section><title>Section</title>
    <p>Text</p>
  </section>
  <section><title>Section</title>
  <p>Text</p>
  </section>
</chapter>
<chapter><title>Chapter</title>
  <p>Text</p>
  <section><title>Section</title>
  <p>Text</p>
  </section>
  <section><title>Section</title>
  <p>Text</p>
  </section>
</chapter>
</doc>

```

In this example the table of contents is formatted with a dot leader between the heading text and the page number.

XSL Stylesheet:

```

<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:fo="http://www.w3.org/1999/XSL/Format"
  version='1.0'>

  <xsl:template match="doc">
    <!-- create the table of contents -->
    <xsl:apply-templates select="chapter/title" mode="toc"/>
    <!-- do the document -->
    <xsl:apply-templates/>
  </xsl:template>

  <xsl:template match="chapter/title" mode="toc">
    <fo:block text-align-last="justify">
      <fo:basic-link internal-destination="{generate-id(.)}">
        <xsl:number level="multiple" count="chapter" format="1. "/>
        <xsl:apply-templates/>
      </fo:basic-link>
      <xsl:text> </xsl:text>
      <fo:leader leader-length.minimum="12pt" leader-length.optimum="40pt"
        leader-length.maximum="100%" leader-pattern="dots"/>
      <xsl:text> </xsl:text>
      <fo:page-number-citation ref-id="{generate-id(.)}"/>
    </fo:block>

```

```

    <xsl:apply-templates select="../section/title" mode="toc"/>
</xsl:template>

<xsl:template match="section/title" mode="toc">
  <fo:block start-indent="10mm" text-align-last="justify">
    <fo:basic-link internal-destination="{generate-id(.)}">
      <xsl:number level="multiple" count="chapter|section" format="1.1 "/>
      <xsl:apply-templates/>
    </fo:basic-link>
    <xsl:text> </xsl:text>
    <fo:leader leader-length.minimum="12pt" leader-length.optimum="40pt"
      leader-length.maximum="100%" leader-pattern="dots"/>
    <xsl:text> </xsl:text>
    <fo:page-number-citation ref-id="{generate-id(.)}"/>
  </fo:block>
</xsl:template>

<xsl:template match="chapter/title">
  <fo:block id="{generate-id(.)}">
    <xsl:number level="multiple" count="chapter" format="1. "/>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="section/title">
  <fo:block id="{generate-id(.)}">
    <xsl:number level="multiple" count="chapter|section" format="1.1 "/>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="p">
  <fo:block>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

</xsl:stylesheet>

```

### Result Instance: elements and attributes in the fo: namespace

```

<fo:block text-align-last="justify">
  <fo:basic-link internal-destination="N4">1. Chapter
</fo:basic-link>
  <fo:leader leader-length.minimum="12pt" leader-length.optimum="40pt"
    leader-length.maximum="100%" leader-pattern="dots">

```

```

</fo:leader>
<fo:page-number-citation ref-id="N4">
</fo:page-number-citation>
</fo:block>
<fo:block start-indent="10mm" text-align-last="justify">
<fo:basic-link internal-destination="N11">1.1 Section
</fo:basic-link>
<fo:leader leader-length.minimum="12pt" leader-length.optimum="40pt"
  leader-length.maximum="100%" leader-pattern="dots">
</fo:leader>
<fo:page-number-citation ref-id="N11">
</fo:page-number-citation>
</fo:block>
<fo:block start-indent="10mm" text-align-last="justify">
<fo:basic-link internal-destination="N19">1.2 Section
</fo:basic-link>
<fo:leader leader-length.minimum="12pt" leader-length.optimum="40pt"
  leader-length.maximum="100%" leader-pattern="dots">
</fo:leader>
<fo:page-number-citation ref-id="N19">
</fo:page-number-citation>
</fo:block>
<fo:block text-align-last="justify">
<fo:basic-link internal-destination="N28">2. Chapter
</fo:basic-link>
<fo:leader leader-length.minimum="12pt" leader-length.optimum="40pt"
  leader-length.maximum="100%" leader-pattern="dots">
</fo:leader>
<fo:page-number-citation ref-id="N28">
</fo:page-number-citation>
</fo:block>
<fo:block start-indent="10mm" text-align-last="justify">
<fo:basic-link internal-destination="N35">2.1 Section
</fo:basic-link>
<fo:leader leader-length.minimum="12pt" leader-length.optimum="40pt"
  leader-length.maximum="100%" leader-pattern="dots">
</fo:leader>
<fo:page-number-citation ref-id="N35">
</fo:page-number-citation>
</fo:block>
<fo:block start-indent="10mm" text-align-last="justify">
<fo:basic-link internal-destination="N43">2.2 Section
</fo:basic-link>
<fo:leader leader-length.minimum="12pt" leader-length.optimum="40pt"
  leader-length.maximum="100%" leader-pattern="dots">

```

```
</fo:leader>
<fo:page-number-citation ref-id="N43">
</fo:page-number-citation>
</fo:block>
```

```
<fo:block id="N4">1. Chapter
</fo:block>
```

```
<fo:block>Text
</fo:block>
```

```
<fo:block id="N11">1.1 Section
</fo:block>
```

```
<fo:block>Text
</fo:block>
```

```
<fo:block id="N19">1.2 Section
</fo:block>
```

```
<fo:block>Text
</fo:block>
```

```
<fo:block id="N28">2. Chapter
</fo:block>
```

```
<fo:block>Text
</fo:block>
```

```
<fo:block id="N35">2.1 Section
</fo:block>
```

```
<fo:block>Text
</fo:block>
```

```
<fo:block id="N43">2.2 Section
</fo:block>
```

```
<fo:block>Text
</fo:block>
```

### 6.6.2. fo:bidi-override

#### *Common Usage:*

The fo:bidi-override formatting object is used when the Unicode BIDI algorithm fails. It forces a string of text to be written in a specific direction.

#### *Areas:*

The fo:bidi-override formatting object generates one or more *normal inline-areas*. The fo:bidi-override returns these areas, together with any *normal block-areas*, *page-level-out-of-line* areas, and *reference-level-out-of-line* areas returned by the children of the fo:bidi-override.

#### *Trait Derivation:*

The direction traits are derived from the "writing-mode", "direction", and "unicode-bidi" properties as described in § 5.5.3 – [Writing-mode and Direction Properties](#) on page 53.

#### *Constraints:*

No area may have more than one normal child area returned by the same fo:bidi-override formatting object.

The children of each normal area returned by an fo:bidi-override must satisfy the constraints specified in § 4.7.3 – [Inline-building](#) on page 39.

#### *Contents:*

```
(#PCDATA|%inline;|%block;)*
```

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

An fo:bidi-override that is a descendant of an fo:leader or of the fo:inline child of an fo:footnote may not have block-level children, unless it has a nearer ancestor that is an fo:inline-container.

*The following properties apply to this formatting object:*


- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Font Properties](#) — § 7.9 on page 268
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “color” — § 7.18.1 on page 335
- “direction” — § 7.29.1 on page 396
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “letter-spacing” — § 7.17.2 on page 328
- “line-height” — § 7.16.4 on page 319
- “score-spaces” — § 7.30.15 on page 413
- “unicode-bidi” — § 7.29.6 on page 400
- “word-spacing” — § 7.17.8 on page 334

### 6.6.3. fo:character


#### *Common Usage:*

The fo:character flow object represents a character that is mapped to a glyph for presentation. It is an atomic unit to the formatter.

When the result tree is interpreted as a tree of formatting objects, a character in the result tree is treated as if it were an empty element of type `fo:character` with a character attribute equal to the Unicode representation of the character. The semantics of an "auto" value for character properties, which is typically their initial value, are based on the Unicode code point. Overrides may be specified in an implementation-specific manner.


 In a stylesheet the explicit creation of an `fo:character` may be used to explicitly override the default mapping.

Unicode Tag Characters need not be supported.

 Unicode Version 3.1, in fact, states that they are not to be used "with *any* protocols that provide alternate means for language tagging, such as HTML or XML.". Unicode TR20 ([[UNICODE TR20](#)]) also declares very clearly that they are not suitable together with markup.

*Areas:*


The `fo:character` formatting object generates and returns one or more *normal inline-area*.

 Cases where more than one *inline-area* is generated are encountered in scripts where a single character generates both a prefix and a suffix glyph to some other character.

*Constraints:*

The dimensions of the areas are determined by the font metrics for the glyph.

When formatting an `fo:character` with a "treat-as-word-space" value of "true", the User Agent may use a different method for determining the *inline-progression-dimension* of the area.

 Such methods typically make use of a word space value stored in the font, or a formatter defined word space value.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Font Properties](#) — § 7.9 on page 268
- [Common Hyphenation Properties](#) — § 7.10 on page 280
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- [Common Relative Position Properties](#) — § 7.13 on page 289
- "alignment-adjust" — § 7.14.1 on page 298
- "treat-as-word-space" — § 7.17.7 on page 333
- "alignment-baseline" — § 7.14.2 on page 300
- "baseline-shift" — § 7.14.3 on page 301
- "character" — § 7.17.1 on page 328
- "color" — § 7.18.1 on page 335
- "dominant-baseline" — § 7.14.5 on page 303
- "text-depth" — § 7.29.5 on page 399
- "text-altitude" — § 7.29.4 on page 399

- “glyph-orientation-horizontal” — § 7.29.2 on page 397
- “glyph-orientation-vertical” — § 7.29.3 on page 398
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “keep-with-next” — § 7.20.4 on page 345
- “keep-with-previous” — § 7.20.5 on page 346
- “letter-spacing” — § 7.17.2 on page 328
- “line-height” — § 7.16.4 on page 319
- “score-spaces” — § 7.30.15 on page 413
- “suppress-at-line-break” — § 7.17.3 on page 330
- “text-decoration” — § 7.17.4 on page 330
- “text-shadow” — § 7.17.5 on page 332
- “text-transform” — § 7.17.6 on page 333
- “visibility” — § 7.30.17 on page 413
- “word-spacing” — § 7.17.8 on page 334

#### 6.6.4. fo:initial-property-set

##### *Common Usage:*

The fo:initial-property-set auxiliary formatting object specifies formatting properties for the first line of an fo:block.



It is analogous to the CSS first-line pseudo-element.

In future versions of this Recommendation a property controlling the number of lines, or the "depth" that these initial properties apply to may be added.

##### *Areas:*

The fo:initial-property-set formatting object does not generate or return any areas. It simply holds a set of traits that are applicable to the first line-area of the area that has a value of "true" for the *is-first* trait and that was generated by the parent fo:block of the fo:initial-property-set.

##### *Trait Derivation:*

The traits on the fo:initial-property-set are taken into account as traits constraining the first line as if the child inline formatting objects of the fo:block, or parts of them in the case of a line-break, that were used in formatting the first line were enclosed by an fo:inline, as a direct child of the fo:block, with those traits.

##### *Constraints:*

None.

##### *Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Font Properties](#) — § 7.9 on page 268

- [Common Relative Position Properties](#) — § 7.13 on page 289
- “color” — § 7.18.1 on page 335
- “letter-spacing” — § 7.17.2 on page 328
- “line-height” — § 7.16.4 on page 319
- “score-spaces” — § 7.30.15 on page 413
- “text-decoration” — § 7.17.4 on page 330
- “text-shadow” — § 7.17.5 on page 332
- “text-transform” — § 7.17.6 on page 333
- “word-spacing” — § 7.17.8 on page 334


### 6.6.5. fo:external-graphic

#### *Common Usage:*

The fo:external-graphic flow object is used for a graphic where the graphics data resides outside of the fo:element tree.

#### *Areas:*

The fo:external-graphic formatting object generates and returns one inline-level viewport-area and one reference-area containing the external graphic. The inline-level area uses the *large-allocation-rectangle* as defined in § 4.2.3 – [Geometric Definitions](#) on page 18.

 An fo:external-graphic may be placed block-level by enclosing it in an fo:block.

A "line-stacking-strategy" of "max-height" or "line-height" is typically used for stacking one or more lines with fo:external-graphic content.


#### *Constraints:*

The viewport's size is determined by the *block-progression-dimension* and *inline-progression-dimension* traits. For values of "auto", the content size of the graphic is used.

The content size of a graphic is determined by taking the intrinsic size of the graphic and scaling as specified by the *content-height*, *content-width*, *scaling*, *allowed-height-scale*, and *allowed-width-scale* traits. If one of the content-height or content-width is not "auto", the same scale factor (as calculated from the specified non-auto value) is applied equally to both directions.

Once scaled, the reference-area is aligned with respect to the viewport-area using the *text-align* and *display-align* traits. If it is too large for the viewport-area, the graphic is aligned as if it would fit and the *overflow* trait controls the clipping, scroll bars, etc.

In the case when the graphics format does not specify an intrinsic size of the graphic the size is determined in an implementation-defined manner.

 For example, a size of 1/96" as the size of one pixel for rasterized images may be used.

#### *Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242



- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “[alignment-adjust](#)” — § 7.14.1 on page 298
- “[alignment-baseline](#)” — § 7.14.2 on page 300
- “[allowed-height-scale](#)” — § 7.15.1 on page 307
- “[allowed-width-scale](#)” — § 7.15.2 on page 307
- “[baseline-shift](#)” — § 7.14.3 on page 301
- “[block-progression-dimension](#)” — § 7.15.3 on page 308
- “[clip](#)” — § 7.21.1 on page 347
- “[content-height](#)” — § 7.15.4 on page 309
- “[content-type](#)” — § 7.30.7 on page 409
- “[content-width](#)” — § 7.15.5 on page 310
- “[display-align](#)” — § 7.14.4 on page 303
- “[dominant-baseline](#)” — § 7.14.5 on page 303
- “[height](#)” — § 7.15.6 on page 311
- “[id](#)” — § 7.30.8 on page 409
- “[index-class](#)” — § 7.24.1 on page 362
- “[index-key](#)” — § 7.24.2 on page 363
- “[inline-progression-dimension](#)” — § 7.15.7 on page 312
- “[keep-with-next](#)” — § 7.20.4 on page 345
- “[keep-with-previous](#)” — § 7.20.5 on page 346
- “[line-height](#)” — § 7.16.4 on page 319
- “[overflow](#)” — § 7.21.2 on page 348
- “[scaling](#)” — § 7.15.12 on page 316
- “[scaling-method](#)” — § 7.15.13 on page 316
- “[src](#)” — § 7.30.16 on page 413
- “[text-align](#)” — § 7.16.9 on page 323
- “[width](#)” — § 7.15.14 on page 317

### 6.6.6. fo:instream-foreign-object

*Common Usage:*

The fo:instream-foreign-object flow object is used for an inline graphic or other "generic" object where the object data resides as descendants of the fo:instream-foreign-object, typically as an XML element subtree in a non-XSL namespace.



A common format is SVG.

*Areas:*

The fo:instream-foreign-object formatting object generates and returns one inline viewport-area and one reference-area containing the instream-foreign-object. The inline-level area uses the *large-allocation-rectangle* as defined in § 4.2.3 – [Geometric Definitions](#) on page 18.

*Constraints:*

The viewport's size is determined by the *block-progression-dimension* and *inline-progression-dimension* traits. For values of "auto", the content size of the instream foreign object is used.

The content size of an instream-foreign-object is determined by taking the intrinsic size of the object and scaling as specified by the *content-height*, *content-width*, *scaling*, *allowed-height-scale*, and *allowed-width-scale* traits. If one of the content-height or content-width is not "auto", the same scale factor (as calculated from the specified non-auto value) is applied equally to both directions.

Once scaled, the reference-area is aligned with respect to the viewport-area using the *text-align* and *display-align* traits. If it is too large for the viewport-area, the instream-foreign-object is aligned as if it would fit and the *overflow* trait controls the clipping, scroll bars, etc.

In the case when the instream-foreign-object does not specify an intrinsic size of the object, the size is determined in an implementation defined manner.

*Contents:*

The fo:instream-foreign-object flow object has a child from a non-XSL namespace. The permitted structure of this child is that defined for that namespace.

The fo:instream-foreign-object flow object may have additional attributes in the non-XSL namespace. These, as well as the xsl defined properties, are made available to the processor of the content of the flow object. Their semantics are defined by that namespace.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “alignment-adjust” — § 7.14.1 on page 298
- “alignment-baseline” — § 7.14.2 on page 300
- “allowed-height-scale” — § 7.15.1 on page 307
- “allowed-width-scale” — § 7.15.2 on page 307
- “baseline-shift” — § 7.14.3 on page 301
- “block-progression-dimension” — § 7.15.3 on page 308
- “clip” — § 7.21.1 on page 347
- “content-height” — § 7.15.4 on page 309
- “content-type” — § 7.30.7 on page 409
- “content-width” — § 7.15.5 on page 310
- “display-align” — § 7.14.4 on page 303
- “dominant-baseline” — § 7.14.5 on page 303
- “height” — § 7.15.6 on page 311
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “inline-progression-dimension” — § 7.15.7 on page 312
- “keep-with-next” — § 7.20.4 on page 345
- “keep-with-previous” — § 7.20.5 on page 346
- “line-height” — § 7.16.4 on page 319
- “overflow” — § 7.21.2 on page 348
- “scaling” — § 7.15.12 on page 316
- “scaling-method” — § 7.15.13 on page 316
- “text-align” — § 7.16.9 on page 323
- “width” — § 7.15.14 on page 317

### 6.6.7. fo:inline

*Common Usage:*

The fo:inline formatting object is commonly used for formatting a portion of text with a background or enclosing it in a border.

*Areas:*

The fo:inline formatting object generates one or more *normal inline-areas*. The fo:inline returns these areas, together with any *normal block-areas*, *page-level-out-of-line areas*, and *reference-level-out-of-line areas* returned by the children of the fo:inline.

*Constraints:*

No area may have more than one normal child area returned by the same fo:inline formatting object.

The children of each normal area returned by an fo:inline must satisfy the constraints specified in § 4.7.3 – [Inline-building](#) on page 39.

In addition the constraints imposed by the traits derived from the properties applicable to this formatting object must be satisfied. The geometric constraints are rigorously defined in § 4 – [Area Model](#) on page 15.

*Contents:*

(#PCDATA|[%inline;](#)|[%block;](#))\*

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

An fo:inline that is a child of an fo:footnote may not have block-level children. An fo:inline that is a descendant of an fo:leader or of the fo:inline child of an fo:footnote may not have block-level children, unless it has a nearer ancestor that is an fo:inline-container.

*The following properties apply to this formatting object:*


- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Font Properties](#) — § 7.9 on page 268
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “[alignment-adjust](#)” — § 7.14.1 on page 298
- “[alignment-baseline](#)” — § 7.14.2 on page 300
- “[baseline-shift](#)” — § 7.14.3 on page 301
- “[block-progression-dimension](#)” — § 7.15.3 on page 308
- “[color](#)” — § 7.18.1 on page 335
- “[dominant-baseline](#)” — § 7.14.5 on page 303
- “[height](#)” — § 7.15.6 on page 311
- “[id](#)” — § 7.30.8 on page 409
- “[index-class](#)” — § 7.24.1 on page 362
- “[index-key](#)” — § 7.24.2 on page 363
- “[inline-progression-dimension](#)” — § 7.15.7 on page 312
- “[keep-together](#)” — § 7.20.3 on page 344
- “[keep-with-next](#)” — § 7.20.4 on page 345
- “[keep-with-previous](#)” — § 7.20.5 on page 346

- “`line-height`” — § 7.16.4 on page 319
- “`text-decoration`” — § 7.17.4 on page 330
- “`visibility`” — § 7.30.17 on page 413
- “`width`” — § 7.15.14 on page 317
- “`wrap-option`” — § 7.16.13 on page 327

### 6.6.8. `fo:inline-container`


#### *Common Usage:*

The `fo:inline-container` flow object is used to generate an inline reference-area, typically containing text blocks with a different writing-mode.

 The use of this flow object is not required for bi-directional text; in this case the Unicode BIDI algorithm and the `fo:bidi-override` are sufficient.

#### *Areas:*


The `fo:inline-container` formatting object generates one or more viewport/reference pairs. All generated viewport-areas are subject to the constraints given by the `block-progression-dimension` and `inline-progression-dimension` traits of the `fo:inline-container`. The `fo:inline-container` returns these areas and any page-level-out-of-line areas returned by the children of the `fo:inline-container`.

 In the case that the `block-progression-dimension.maximum` is other than "auto", then overflow processing may apply. The "repeat" value of overflow can be used to generate multiple viewport/reference pairs if this is desired rather than clipping or scrolling.

If the `absolute-position` trait is "auto", these areas all have an `area-class` of "xsl-normal". If the `absolute-position` trait is "absolute" or "fixed" then there is one viewport/reference pair, and its `area-class` is "xsl-absolute" or "xsl-fixed", respectively.

#### *Trait Derivation:*

The `reference-orientation` and `writing-mode` traits of the viewport-area and reference-area come from the `fo:inline-container`. These determine the orientation of the start-edge, end-edge, before-edge and after-edge of the content-rectangle of the viewport-area, and of the padding-, border-, and content-rectangles of the reference-area. The *reference-orientation* of the reference-area is set to "0" and is, therefore, the same as the orientation established by the viewport-area. The `inline-progression-dimension` of the reference-area is the same as that of the viewport-area, and may not be "auto" if the `inline-progression-direction` is different from that of the parent of the `fo:inline-container`. The `block-progression-dimension` of the reference-area is not constrained; thus the reference-area may be larger than the viewport-area and this may cause the "overflow" property to operate.

 As a property value applies to each of the areas generated by this flow object the size can vary from instance to instance if the value is "auto" or a `<length-range>`.

The values in the baseline-table of this object are calculated as follows:

#### ***baseline***

If the writing mode has a `block-progression-direction` that is parallel to the `block-progression-direction` of the parent: the `alignment-point` is at the position of the dominant-baseline of the first descendant line-area. If there is no such line-area the `alignment-point` is at the position of the after-edge of the allocation rectangle.

If the writing mode has a block-progression-direction that is not parallel to the block-progression-direction of the parent: the alignment-point is at the position that is half way between the before-edge and after-edge of the content rectangle.

***before-edge***

The alignment-point is at the position of the before-edge of the allocation rectangle.

***text-before-edge***

The alignment-point is at the position that is the closest to the before-edge of the allocation rectangle selected from the two candidate edges. If the writing mode has a block-progression-direction that is parallel to the block-progression-direction of the parent the candidate edges are the before-edge and the after-edge of the content rectangle; if it is not, the candidate edges are the start-edge and the end-edge of the content rectangle.

***middle***

The alignment-point is at the position that is half way between the before-edge and after-edge of the allocation rectangle.

***after-edge***

The alignment-point is at the position of the after-edge of the allocation rectangle.

***text-after-edge***

The alignment-point is at the position that is the closest to the after-edge of the allocation rectangle selected from the two candidate edges. If the writing mode has a block-progression-direction that is parallel to the block-progression-direction of the parent the candidate edges are the before-edge and the after-edge of the content rectangle; if it is not, the candidate edges are the start-edge and the end-edge of the content rectangle.

***ideographic***

The alignment-point is at the position that is 7/10 of the distance from the before-edge of the allocation rectangle to the after-edge of the allocation rectangle.

***alphabetic***

The alignment-point is at the position that is 6/10 of the distance from the before-edge of the allocation rectangle to the after-edge of the allocation rectangle.

***hanging***

The alignment-point is at the position that is 2/10 of the distance from the before-edge of the allocation rectangle to the after-edge of the allocation rectangle.

***mathematical***

The alignment-point is at the position that is 5/10 of the distance from the before-edge of the allocation rectangle to the after-edge of the allocation rectangle.

***Constraints:***

No area may have more than one normal child area returned by the same fo:inline-container formatting object.

The children of each reference-area generated by an fo:inline-container formatting object must be normal *block-areas* returned by the children of the fo:inline-container, must be *properly stacked*, and must be *properly ordered*.

Any *reference-level-out-of-line* areas returned by the children of the `fo:inline-container` are handled as described in § 6.12.2 – `fo:float` on page 214.

*Contents:*

(`%block;`)+

In addition this formatting object may have a sequence of zero or more `fo:marker`s as its initial children.

*The following properties apply to this formatting object:*

- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “`alignment-adjust`” — § 7.14.1 on page 298
- “`alignment-baseline`” — § 7.14.2 on page 300
- “`baseline-shift`” — § 7.14.3 on page 301
- “`block-progression-dimension`” — § 7.15.3 on page 308
- “`clip`” — § 7.21.1 on page 347
- “`display-align`” — § 7.14.4 on page 303
- “`dominant-baseline`” — § 7.14.5 on page 303
- “`height`” — § 7.15.6 on page 311
- “`id`” — § 7.30.8 on page 409
- “`index-class`” — § 7.24.1 on page 362
- “`index-key`” — § 7.24.2 on page 363
- “`inline-progression-dimension`” — § 7.15.7 on page 312
- “`keep-together`” — § 7.20.3 on page 344
- “`keep-with-next`” — § 7.20.4 on page 345
- “`keep-with-previous`” — § 7.20.5 on page 346
- “`line-height`” — § 7.16.4 on page 319
- “`overflow`” — § 7.21.2 on page 348
- “`reference-orientation`” — § 7.21.3 on page 349
- “`width`” — § 7.15.14 on page 317
- “`writing-mode`” — § 7.29.7 on page 401

### 6.6.9. `fo:leader`

*Common Usage:*

The `fo:leader` formatting object is often used:

- in table-of-contents to generate sequences of "." glyphs that separate titles from page numbers
- to create entry fields in fill-in-the-blank forms
- to create horizontal rules for use as separators

*Areas:*

The `fo:leader` formatting object generates and returns a single normal *inline-area*.


*Trait Derivation:*

If the value of the *leader-pattern* is "use-content" the *block-progression-dimension* of the content-rectangle is determined in the same manner as for inline-areas; otherwise it is determined by the *rule-thickness* trait.

*Constraints:*

If the leader's minimum length is too long to place in the line-area, the leader will begin a new line. If it is too long to be placed in a line by itself, it will overflow the line and potentially overflow the reference-area in accordance with that container's *overflow* trait.

The fo:leader formatting object can have any inline formatting objects and characters as its children, except that fo:leaders may not be nested. Its children are ignored unless the value of the *leader-pattern* trait is "use-content".


 If the value of the *leader-pattern* trait is "use-content" and the fo:leader has no children, the leader shall be filled with blank space.


The inline-area generated by the fo:leader has a dimension in the inline-progression-direction which shall be at least the *leader-length.minimum* and at most the *leader-length.maximum*.


For lines-areas that have been specified to be justified, the justified line-area must honor the *leader-alignment* trait of any inline-areas generated by fo:leaders.

If the value of the *leader-pattern* trait is "dots" or "use-content", the following constraint applies:

The inline-area generated by the fo:leader has as its children the areas returned by children of the fo:leader, or obtained by formatting the pattern specified in the *leader-pattern* trait, repeated an integral number of times. If the width of even a single repetition is larger than the dimension of the inline-area in the inline-progression-direction, the inline-area shall be filled with blank space. The space-start and space-end of the child areas is set to account for the constraints specified in the *leader-pattern-width* and *leader-alignment* traits.

 If it is desired that the leader should stretch to fill all available space on a line, the maximum length of the leader should be specified to be at least as large as the column width.

 The alignment of the leader may be script specific and may require indicating what alignment point is required, because it is different from the default alignment for the script. For example, in some usage of Indic scripts the leader is aligned at the alphabetic baseline.

 An fo:leader can be wrapped in an fo:block, yielding a block-area with a line-area containing the leader, to create a rule for separating or decorating block-areas.

*Contents:*

`(#PCDATA|%inline;)*`

The content must not contain an fo:leader, fo:inline-container, fo:block-container, fo:float, fo:footnote, or fo:marker either as a direct child or as a descendant.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Font Properties](#) — § 7.9 on page 268
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- [Common Relative Position Properties](#) — § 7.13 on page 289

- “alignment-adjust” — § 7.14.1 on page 298
- “alignment-baseline” — § 7.14.2 on page 300
- “baseline-shift” — § 7.14.3 on page 301
- “color” — § 7.18.1 on page 335
- “dominant-baseline” — § 7.14.5 on page 303
- “text-depth” — § 7.29.5 on page 399
- “text-orientation” — § 7.29.4 on page 399
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “keep-with-next” — § 7.20.4 on page 345
- “keep-with-previous” — § 7.20.5 on page 346
- “leader-alignment” — § 7.22.1 on page 351
- “leader-length” — § 7.22.4 on page 353
- “leader-pattern” — § 7.22.2 on page 351
- “leader-pattern-width” — § 7.22.3 on page 352
- “rule-style” — § 7.22.5 on page 353
- “rule-thickness” — § 7.22.6 on page 354
- “letter-spacing” — § 7.17.2 on page 328
- “line-height” — § 7.16.4 on page 319
- “text-shadow” — § 7.17.5 on page 332
- “visibility” — § 7.30.17 on page 413
- “word-spacing” — § 7.17.8 on page 334

### 6.6.10. fo:page-number

#### *Common Usage:*

The fo:page-number formatting object is used to obtain an inline-area whose content is the page-number for the page on which the inline-area is placed.

#### *Areas:*


The fo:page-number formatting object generates and returns a single normal *inline-area*.

#### *Constraints:*

The content of the inline-area depends on the *reference-page* and the *reference-page-sequence*. For the fo:page-number the *reference-page* is the page on which the inline-area is placed and the *reference-page-sequence* is the ancestor fo:page-sequence of the fo:page-number.

The child areas of this inline-area are the same as the result of formatting a result-tree fragment consisting of the content of any fo:folio-prefix child of the *reference-page-sequence*, followed by fo:character flow objects; one for each character in the folio-number string and with only the "character" property specified, followed by the content of any fo:folio-suffix child of the *reference-page-sequence*.

The folio-number string is obtained by converting the folio-number for the *reference-page* in accordance with the number to string conversion properties of the *reference-page-sequence*.

 The conversion properties are: § 7.26.1 – “format” on page 369, § 7.26.2 – “grouping-separator” on page 369, § 7.26.3 – “grouping-size” on page 369, § 7.26.4 – “letter-value” on page 370, § 7.10.1 – “country” on page 280, and § 7.10.2 – “language” on page 280.



*Contents:*


EMPTY

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Font Properties](#) — § 7.9 on page 268
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “[alignment-adjust](#)” — § 7.14.1 on page 298
- “[alignment-baseline](#)” — § 7.14.2 on page 300
- “[baseline-shift](#)” — § 7.14.3 on page 301
- “[dominant-baseline](#)” — § 7.14.5 on page 303
- “[id](#)” — § 7.30.8 on page 409
- “[index-class](#)” — § 7.24.1 on page 362
- “[index-key](#)” — § 7.24.2 on page 363
- “[keep-with-next](#)” — § 7.20.4 on page 345
- “[keep-with-previous](#)” — § 7.20.5 on page 346
- “[letter-spacing](#)” — § 7.17.2 on page 328
- “[line-height](#)” — § 7.16.4 on page 319
- “[score-spaces](#)” — § 7.30.15 on page 413
- “[text-altitude](#)” — § 7.29.4 on page 399
- “[text-decoration](#)” — § 7.17.4 on page 330
- “[text-depth](#)” — § 7.29.5 on page 399
- “[text-shadow](#)” — § 7.17.5 on page 332
- “[text-transform](#)” — § 7.17.6 on page 333
- “[visibility](#)” — § 7.30.17 on page 413
- “[word-spacing](#)” — § 7.17.8 on page 334
- “[wrap-option](#)” — § 7.16.13 on page 327

**6.6.11. fo:page-number-citation***Common Usage:*

The `fo:page-number-citation` is used to reference the page-number for the page containing the first *normal* area returned by the cited formatting object.

 It may be used to provide the page-numbers in the table of contents, cross-references, and index entries.

*Areas:*

The `fo:page-number-citation` formatting object generates and returns a single normal *inline-area*.

*Constraints:*

The *cited page* is the page containing, as a descendant, the first normal area returned by the formatting object with an *id* trait matching the *ref-id* trait of the `fo:page-number-citation` (the referenced formatting object).

The child areas of the generated inline-area are the same as the result of formatting the result-tree fragment, defined in § 6.6.10 – `fo:page-number` on page 142, using the *cited page* as the *reference-page*, and the `fo:page-sequence` that generated the *cited-page* as the *reference-page-sequence*.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Font Properties](#) — § 7.9 on page 268
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “`alignment-adjust`” — § 7.14.1 on page 298
- “`alignment-baseline`” — § 7.14.2 on page 300
- “`baseline-shift`” — § 7.14.3 on page 301
- “`dominant-baseline`” — § 7.14.5 on page 303
- “`id`” — § 7.30.8 on page 409
- “`index-class`” — § 7.24.1 on page 362
- “`index-key`” — § 7.24.2 on page 363
- “`keep-with-next`” — § 7.20.4 on page 345
- “`keep-with-previous`” — § 7.20.5 on page 346
- “`letter-spacing`” — § 7.17.2 on page 328
- “`line-height`” — § 7.16.4 on page 319
- “`ref-id`” — § 7.30.13 on page 412
- “`score-spaces`” — § 7.30.15 on page 413
- “`text-altitude`” — § 7.29.4 on page 399
- “`text-decoration`” — § 7.17.4 on page 330
- “`text-depth`” — § 7.29.5 on page 399
- “`text-shadow`” — § 7.17.5 on page 332
- “`text-transform`” — § 7.17.6 on page 333
- “`visibility`” — § 7.30.17 on page 413
- “`word-spacing`” — § 7.17.8 on page 334
- “`wrap-option`” — § 7.16.13 on page 327

## 6.6.12. `fo:page-number-citation-last`

*Common Usage:*

The `fo:page-number-citation-last` is used to reference the page-number for the last page containing an area that is (a) returned by the cited formatting object and (b) has an area-class that is consistent with the specified `page-citation-strategy`.



It may be used to provide the page-numbers in the table of contents, cross-references, and, when combined with `fo:page-number-citation`, for page range entries.

*Areas:*

The `fo:page-number-citation-last` formatting object generates and returns a single normal *inline-area*.

*Constraints:*

The *cited page* is the page of the last page area (in the pre-order traversal order of the area tree) that satisfies the constraints of the *page-citation-strategy* on this `fo:page-number-citation-last`.

The child areas of the generated inline-area are the same as the result of formatting the result-tree fragment, defined in § 6.6.10 – `fo:page-number` on page 142, using the *cited page* as the *reference-page*, and the `fo:page-sequence` that generated the *cited-page* as the *reference-page-sequence*.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Font Properties](#) — § 7.9 on page 268
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “`alignment-adjust`” — § 7.14.1 on page 298
- “`alignment-baseline`” — § 7.14.2 on page 300
- “`baseline-shift`” — § 7.14.3 on page 301
- “`dominant-baseline`” — § 7.14.5 on page 303
- “`id`” — § 7.30.8 on page 409
- “`index-class`” — § 7.24.1 on page 362
- “`index-key`” — § 7.24.2 on page 363
- “`keep-with-next`” — § 7.20.4 on page 345
- “`keep-with-previous`” — § 7.20.5 on page 346
- “`letter-spacing`” — § 7.17.2 on page 328
- “`line-height`” — § 7.16.4 on page 319
- “`page-citation-strategy`” — § 7.30.10 on page 410
- “`ref-id`” — § 7.30.13 on page 412
- “`score-spaces`” — § 7.30.15 on page 413
- “`text-altitude`” — § 7.29.4 on page 399
- “`text-decoration`” — § 7.17.4 on page 330
- “`text-depth`” — § 7.29.5 on page 399
- “`text-shadow`” — § 7.17.5 on page 332
- “`text-transform`” — § 7.17.6 on page 333
- “`visibility`” — § 7.30.17 on page 413
- “`word-spacing`” — § 7.17.8 on page 334
- “`wrap-option`” — § 7.16.13 on page 327

### 6.6.13. `fo:folio-prefix`

*Common Usage:*

The `fo:folio-prefix` formatting object specifies a static prefix for the folio numbers within a page-sequence.

*Areas:*

The fo:folio-prefix formatting object does not directly produce any areas. Its children will be retrieved and used when formatting page numbers.

*Constraints:*

None.

*Contents:*

```
(#PCDATA|%inline;)*
```

An fo:folio-prefix is not permitted to have an fo:page-number, fo:page-number-citation, or fo:page-number-citation-last as a descendant.

**6.6.14. fo:folio-suffix***Common Usage:*

The fo:folio-suffix formatting object specifies a static suffix for the folio numbers within a page-sequence.

*Areas:*

The fo:folio-suffix formatting object does not directly produce any areas. Its children will be retrieved and used when formatting page numbers.

*Constraints:*

None.

*Contents:*

```
(#PCDATA|%inline;)*
```

An fo:folio-suffix is not permitted to have an fo:page-number, fo:page-number-citation, or fo:page-number-citation-last as a descendant.

**6.6.15. fo:scaling-value-citation***Common Usage:*

The fo:scaling-value-citation is used to obtain the scale-factor applied to the cited fo:external-graphic.



It may be used to provide the scale used in applications where a graphic is normally shown at true size, but is scaled down if it does not fit.

*Areas:*


The fo:scaling-value-citation formatting object generates and returns a single normal *inline-area*.

*Constraints:*


The *cited fo:external-graphic* is the fo:external-graphic with an *id* trait matching the *ref-id* trait of the fo:scaling-value-citation.

The *applied scale-factor* is the scale-factor that was applied to the intrinsic size of the cited fo:external-graphic multiplied by the value of the "intrinsic-scale-value" property. It is expressed as an integer per-

centage value. The "scale-option" property specifies if the scale-factor for the width or height should be used.

 In the case when the graphics format does not specify an intrinsic size of the graphic and the size has been determined in an implementation-defined manner the scale factor obtained may not be meaningful.

The *applied scale-factor string* is obtained by converting the applied scale-factor in accordance with the number to string conversion properties.

 The conversion properties are: § 7.26.1 – “format” on page 369, § 7.26.2 – “grouping-separator” on page 369, § 7.26.3 – “grouping-size” on page 369, § 7.26.4 – “letter-value” on page 370, § 7.10.1 – “country” on page 280, and § 7.10.2 – “language” on page 280.

The child areas of the generated inline-area are the same as the result of formatting a result-tree fragment consisting of fo:character flow objects; one for each character in the applied scale-factor string and with only the "character" property specified.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

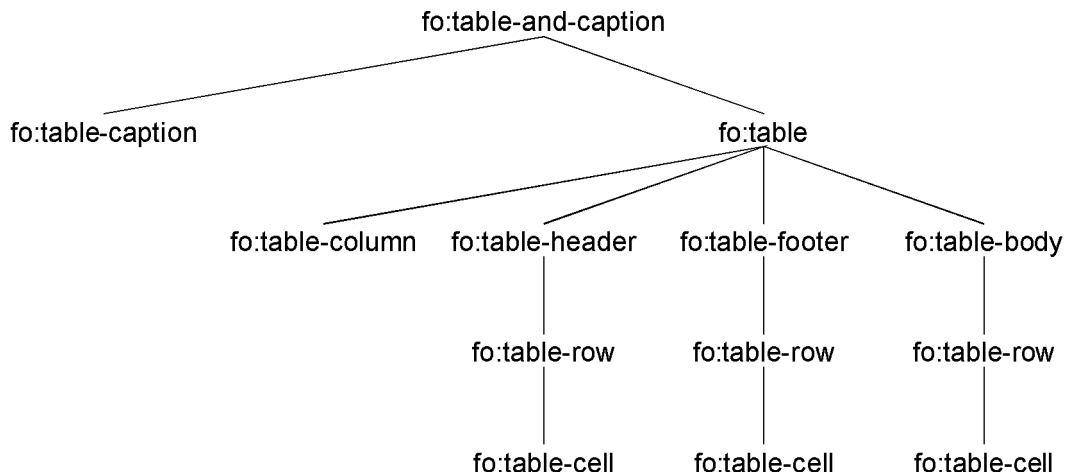
- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Font Properties](#) — § 7.9 on page 268
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “alignment-adjust” — § 7.14.1 on page 298
- “alignment-baseline” — § 7.14.2 on page 300
- “baseline-shift” — § 7.14.3 on page 301
- “country” — § 7.10.1 on page 280
- “dominant-baseline” — § 7.14.5 on page 303
- “format” — § 7.26.1 on page 369
- “grouping-separator” — § 7.26.2 on page 369
- “grouping-size” — § 7.26.3 on page 369
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “keep-with-next” — § 7.20.4 on page 345
- “keep-with-previous” — § 7.20.5 on page 346
- “language” — § 7.10.2 on page 280
- “letter-spacing” — § 7.17.2 on page 328
- “letter-value” — § 7.26.4 on page 370
- “line-height” — § 7.16.4 on page 319
- “intrinsic-scale-value” — § 7.30.9 on page 410
- “ref-id” — § 7.30.13 on page 412
- “score-spaces” — § 7.30.15 on page 413
- “scale-option” — § 7.30.14 on page 412
- “text-altitude” — § 7.29.4 on page 399

- “text-decoration” — § 7.17.4 on page 330
- “text-depth” — § 7.29.5 on page 399
- “text-shadow” — § 7.17.5 on page 332
- “text-transform” — § 7.17.6 on page 333
- “visibility” — § 7.30.17 on page 413
- “word-spacing” — § 7.17.8 on page 334
- “wrap-option” — § 7.16.13 on page 327

## 6.7. Formatting Objects for Tables

### 6.7.1. Introduction

There are nine formatting objects used to construct tables: fo:table-and-caption, fo:table, fo:table-column, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, and fo:table-cell. The result tree structure is shown below.



**Tree Representation of the Formatting Objects for Tables**

#### 6.7.1.1. Examples

##### 6.7.1.1.1. Simple Table, Centered and Indented

Input sample:

```

<doc>
<table>
<caption><p>Caption for this table</p></caption>
<tgroup cols="3" width="325pt">
<colspec colwidth="100pt"/>
<colspec colwidth="150pt"/>
<colspec colwidth="75pt"/>
<tbody>
<row>
<entry><p>Cell 1</p></entry>
<entry><p>Cell 2</p></entry>
<entry><p>Cell 3</p></entry>
</row>
  
```

```

</tbody>
</tgroup>
</table>
</doc>

```

The table and its caption is centered in the available space between the following indents: start-indent="100pt" and end-indent="0pt". The centering and indent is not desired for the content of the caption and the cells.

#### XSL Stylesheet:

```

<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                xmlns:fo="http://www.w3.org/1999/XSL/Format"
                version='1.0'>

<xsl:attribute-set name="inside-table">
  <xsl:attribute name="start-indent">0pt</xsl:attribute>
  <xsl:attribute name="text-align">start</xsl:attribute>
</xsl:attribute-set>

<xsl:template match="p">
  <fo:block>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="table">
  <fo:table-and-caption text-align="center" start-indent="100pt">
    <xsl:apply-templates/>
  </fo:table-and-caption>
</xsl:template>

<xsl:template match="caption">
  <fo:table-caption xsl:use-attribute-sets="inside-table">
    <xsl:apply-templates/>
  </fo:table-caption>
</xsl:template>

<xsl:template match="tgroup">
  <fo:table width="{@width}" table-layout="fixed">
    <xsl:apply-templates/>
  </fo:table>
</xsl:template>

<xsl:template match="colspec">
  <fo:table-column column-width="{@colwidth}">

```

```

    <xsl:attribute name="column-number">
      <xsl:number count="colspec"/>
    </xsl:attribute>
  </fo:table-column>
</xsl:template>

<xsl:template match="tbody">
  <fo:table-body xsl:use-attribute-sets="inside-table">
    <xsl:apply-templates/>
  </fo:table-body>
</xsl:template>

<xsl:template match="row">
  <fo:table-row>
    <xsl:apply-templates/>
  </fo:table-row>
</xsl:template>

<xsl:template match="entry">
  <fo:table-cell>
    <xsl:apply-templates/>
  </fo:table-cell>
</xsl:template>

</xsl:stylesheet>

```

#### Result Instance: elements and attributes in the fo: namespace

```

<fo:table-and-caption text-align="center" start-indent="100pt">

  <fo:table-caption start-indent="0pt" text-align="start">
    <fo:block>Caption for this table
  </fo:block>
</fo:table-caption>

  <fo:table width="325pt" table-layout="fixed">

    <fo:table-column column-width="100pt" column-number="1">
</fo:table-column>
    <fo:table-column column-width="150pt" column-number="2">
</fo:table-column>
    <fo:table-column column-width="75pt" column-number="3">
</fo:table-column>

    <fo:table-body start-indent="0pt" text-align="start">

```



```

<fo:table-row>

  <fo:table-cell>
  <fo:block>Cell 1
  </fo:block>
</fo:table-cell>
  <fo:table-cell>
  <fo:block>Cell 2
  </fo:block>
</fo:table-cell>
  <fo:table-cell>
  <fo:block>Cell 3
  </fo:block>
</fo:table-cell>

</fo:table-row>

</fo:table-body>

</fo:table>

</fo:table-and-caption>

```

#### 6.7.1.1.2. Simple Table with Relative Column-width Specifications

This example is using a simple, "Oasis-table-model-like", markup for the table elements. The column-widths are specified using full relative column-width specification.

Input sample:

```

<doc>
<table>
<tgroup cols="3">
<colspec colname="col1" colwidth="1*"/>
<colspec colname="col2" colwidth="2*+2pi"/>
<colspec colname="col3" colwidth="72"/>
<tbody>
<row>
<entry colnum="1" valign="top"><p>Cell 1</p></entry>
<entry colnum="2" valign="middle" align="center"><p>Cell 2</p></entry>
<entry colnum="3" align="center"><p>Cell 3</p></entry>
</row>
</tbody>
</tgroup>
</table>
</doc>

```

**XSL Stylesheet:**

```
<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                xmlns:fo="http://www.w3.org/1999/XSL/Format"
                version='1.0'>

<xsl:template match="p">
  <fo:block>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="table">
  <fo:table width="12cm" table-layout="fixed">
    <xsl:apply-templates/>
  </fo:table>
</xsl:template>

<xsl:template match="colspec">
  <fo:table-column>
    <xsl:attribute name="column-number">
      <xsl:number count="colspec"/>
    </xsl:attribute>
    <xsl:attribute name="column-width">
      <xsl:call-template name="calc.column.width">
        <xsl:with-param name="colwidth">
          <xsl:value-of select="@colwidth"/>
        </xsl:with-param>
      </xsl:call-template>
    </xsl:attribute>
  </fo:table-column>
</xsl:template>

<xsl:template match="tbody">
  <fo:table-body>
    <xsl:apply-templates/>
  </fo:table-body>
</xsl:template>

<xsl:template match="row">
  <fo:table-row>
    <xsl:apply-templates/>
  </fo:table-row>
</xsl:template>
```

---

```

<xsl:template match="entry">
  <fo:table-cell column-number="{@colnum}">
    <xsl:if test="@valign">
      <xsl:choose>
        <xsl:when test="@valign='middle'">
          <xsl:attribute name="display-align">center</xsl:attribute>
        </xsl:when>
        <xsl:when test="@valign='top'">
          <xsl:attribute name="display-align">before</xsl:attribute>
        </xsl:when>
        <xsl:when test="@valign='bottom'">
          <xsl:attribute name="display-align">after</xsl:attribute>
        </xsl:when>
        <xsl:otherwise>
          <xsl:attribute name="display-align">before</xsl:attribute>
        </xsl:otherwise>
      </xsl:choose>
    </xsl:if>
    <xsl:if test="@align">
      <xsl:attribute name="text-align">
        <xsl:value-of select="@align"/>
      </xsl:attribute>
    </xsl:if>
    <xsl:apply-templates/>
  </fo:table-cell>
</xsl:template>

<xsl:template name="calc.column.width">
<!-- **
  * <p>Calculate an XSL FO table column-width specification from a
  * full relative table column-width specification.</p>
  *
  * <p>Table column-widths are in the following basic
  * forms:</p>
  *
  * <ul>
  * <li><b>99.99units</b>, a fixed length-specifier.</li>
  * <li><b>99.99</b>, a fixed length-specifier without any units.</li>
  * <li><b>99.99*</b>, a relative length-specifier.</li>
  * <li><b>99.99*+99.99units</b>, a combination of both.</li>
  * </ul>
  *
  * <p>The units are points (pt), picas (pi), centimeters (cm),
  * millimeters (mm), and inches (in). These are the same units as XSL,

```

```

* except that XSL abbreviates picas "pc" instead of "pi". If a length
* specifier has no units, the default unit (pt) is assumed.</p>
*
* <p>Relative length-specifiers are represented in XSL with the
* proportional-column-width() function.</p>
*
* <p>Here are some examples:</p>
*
* <ul>
* <li>"36pt" becomes "36pt"</li>
* <li>"3pi" becomes "3pc"</li>
* <li>"36" becomes "36pt"</li>
* <li>"3*" becomes "proportional-column-width(3)"</li>
* <li>"3*+2pi" becomes "proportional-column-width(3)+2pc"</li>
* <li>"1*+2" becomes "proportional-column-width(1)+2pt"</li>
* </ul>
*
* @param colwidth The column width specification.
*
* @returns The XSL column width specification.
* -->
<xsl:param name="colwidth">1*</xsl:param>

<!-- Ok, the colwidth could have any one of the following forms: -->
<!--      1*          = proportional width -->
<!--      lunit      = 1.0 units wide -->
<!--      1          = 1pt wide -->
<!--      1*+lunit   = proportional width + some fixed width -->
<!--      1*+1       = proportional width + some fixed width -->

<!-- If it has a proportional width, translate it to XSL -->
<xsl:if test="contains($colwidth, '*')">
  <xsl:text>proportional-column-width(</xsl:text>
  <xsl:value-of select="substring-before($colwidth, '*')"/>
  <xsl:text>)</xsl:text>
</xsl:if>

<!-- Now get the non-proportional part of the specification -->
<xsl:variable name="width-units">
  <xsl:choose>
    <xsl:when test="contains($colwidth, '*')">
      <xsl:value-of
        select="normalize-space(substring-after($colwidth, '*'))"/>
    </xsl:when>
    <xsl:otherwise>

```

```

        <xsl:value-of select="normalize-space($colwidth)"/>
    </xsl:otherwise>
</xsl:choose>
</xsl:variable>

<!-- Now the width-units could have any one of the following forms: -->
<!--           = <empty string> -->
<!--    lunit   = 1.0 units wide -->
<!--         1   = 1pt wide -->
<!-- with an optional leading sign -->

<!-- Get the width part by blanking out the units part and discarding -->
<!-- white space. -->
<xsl:variable name="width"
    select="normalize-space(translate($width-units,
                                   '+-0123456789.abcdefghijklmnopqrstuvwxy',
                                   '+-0123456789.'))"/>

<!-- Get the units part by blanking out the width part and discarding -->
<!-- white space. -->
<xsl:variable name="units"
    select="normalize-space(translate($width-units,
                                   'abcdefghijklmnopqrstuvwxy+-0123456789.',
                                   'abcdefghijklmnopqrstuvwxy'))"/>

<!-- Output the width -->
<xsl:value-of select="$width"/>

<!-- Output the units, translated appropriately -->
<xsl:choose>
    <xsl:when test="$units = 'pi'">pc</xsl:when>
    <xsl:when test="$units = '' and $width != ''">pt</xsl:when>
    <xsl:otherwise><xsl:value-of select="$units"/></xsl:otherwise>
</xsl:choose>
</xsl:template>

</xsl:stylesheet>

```

**Result Instance: elements and attributes in the fo: namespace**

```

<fo:table width="12cm" table-layout="fixed">
  <fo:table-column column-number="1" column-width="proportional-column-width(1)">
  </fo:table-column>
  <fo:table-column column-number="2"

```

```

column-width="proportional-column-width(2)+2pc">
  </fo:table-column>
  <fo:table-column column-number="3" column-width="72pt">
  </fo:table-column>
  <fo:table-body>
    <fo:table-row>
      <fo:table-cell column-number="1" display-align="before">
        <fo:block>Cell 1
      </fo:block>
      </fo:table-cell>
      <fo:table-cell column-number="2" display-align="center" text-align="center">
        <fo:block>Cell 2
      </fo:block>
      </fo:table-cell>
      <fo:table-cell column-number="3" text-align="center">
        <fo:block>Cell 3
      </fo:block>
      </fo:table-cell>
    </fo:table-row>
  </fo:table-body>
</fo:table>

```

### 6.7.2. fo:table-and-caption

#### Common Usage:

The fo:table-and-caption flow object is used for formatting a table together with its caption.



An fo:table-and-caption may be placed inline by enclosing it in an fo:inline-container.



This formatting object corresponds to the CSS anonymous box that encloses the table caption and the table.

#### Areas:

The fo:table-and-caption formatting object generates one or more *normal block-areas*. The fo:table-and-caption returns these areas, any *page-level-out-of-line* areas, and any *reference-level-out-of-line* areas returned by the children of the fo:table-and-caption.

#### Constraints:

No area may have more than one normal child area returned by the same fo:table-and-caption formatting object.

The children of the areas generated by the fo:table-and-caption are one or two areas; one for the table caption and one for the table itself. These are positioned relative to each other as specified by the *caption-side* trait. They are placed relative to the content-rectangle of the generated area as specified by the *text-align* trait.

*Contents:*

([table-caption?](#), [table](#))

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Margin Properties-Block](#) — § 7.11 on page 283
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “break-after” — § 7.20.1 on page 343
- “break-before” — § 7.20.2 on page 344
- “caption-side” — § 7.28.7 on page 385
- “clear” — § 7.19.1 on page 337
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “intrusion-displace” — § 7.19.3 on page 342
- “keep-together” — § 7.20.3 on page 344
- “keep-with-next” — § 7.20.4 on page 345
- “keep-with-previous” — § 7.20.5 on page 346
- “text-align” — § 7.16.9 on page 323

### 6.7.3. fo:table

*Common Usage:*

The fo:table flow object is used for formatting the tabular material of a table.

The fo:table flow object and its child flow objects model the visual layout of a table in a "row primary" manner. A complete table may be seen as consisting of a grid of rows and columns where each cell occupies one or more grid units in the row-progression-direction and column-progression-direction.


The table content is divided into a header (optional), footer (optional), and one or more bodies. Properties specify if the headers and footers should be repeated at a break in the table. Each of these parts occupies one or more rows in the table grid.

*Areas:*

The fo:table formatting object generates and returns one or more *normal block-areas*. These areas consist of the content of the fo:table-header (unless omitted as specified by the "table-omit-header-at-break" property), followed by some portion of the content of the fo:table-body(s), followed by the content of the fo:table-footer (unless omitted as specified by the "table-omit-footer-at-break" property). In addition the fo:table returns any *page-level-out-of-line* areas, and any *reference-level-out-of-line* areas returned by the children of the fo:table.


The areas generated and returned by the fo:table formatting object have as children:

- Areas, with only background, corresponding to the table-header, table-footer, table-body, spanned columns, columns, and rows.

 The spanned columns (fo:table-column with a "number-columns-spanned" value greater than 1) are used in the same way as the "column groups" in CSS2 for determining the background.

- Areas returned by the fo:table-cell formatting objects.

These areas have a z-index controlling the rendering order determined in accordance with 17.5.1 of the CSS2 specification (<http://www.w3.org/TR/REC-CSS2/tables.html#table-layers>).

 A cell that is spanned may have a different background in each of the grid units it occupies.


#### *Trait Derivation:*

The column-progression-direction and row-progression-direction are determined by the *writing-mode* trait. Columns use the inline-progression-direction, and rows use the block-progression-direction.

The method for deriving the border traits for a table is specified by the "border-collapse" property.

If the value of the "border-collapse" property is "separate" the border is composed of two components. The first, which is placed with the inside edge coincident with the outermost table grid boundary line, has the width of half the value for the "border-separation" property. It is filled in accordance with the "background" property of the fo:table. Second, outside the outermost table grid boundary line is placed, for each side of the table, a border based on a border specified on the table.

If the value of the "border-collapse" property is "collapse" or "collapse-with-precedence" the border is determined, for each segment, at the cell level.

 By specifying "collapse-with-precedence" and an appropriately high precedence on the border specification for the fo:table one may ensure that this specification is the one used on all border segments.

#### *Constraints:*

No area may have more than one normal child area returned by the same fo:table formatting object.

The content of the fo:table-header and fo:table-footer, unless omitted as specified by the "table-omit-header-at-break" and "table-omit-footer-at-break" properties, shall be repeated for each normal block-area generated and returned by the fo:table formatting object.

The inline-progression-dimension of the content-rectangle of the table is the sum of the inline-progression-dimensions of the columns in the table grid. The method used to determine these inline-progression-dimensions is governed by the values of the *table-layout* and the *inline-progression-dimension* traits in the following manner:

***inline-progression-dimension="auto" table-layout="auto"***

The automatic table layout shall be used.

***inline-progression-dimension="auto" table-layout="fixed"***

The automatic table layout shall be used.

***inline-progression-dimension=<length> or <percentage> table-layout="auto"***

The automatic table layout shall be used.


***inline-progression-dimension=<length> or <percentage> table-layout="fixed"***


The fixed table layout shall be used.




The automatic table layout and fixed table layout is defined in 17.5.2 of the CSS2 specification (<http://www.w3.org/TR/REC-CSS2/tables.html#width-layout>).

The method for determining the block-progression-dimension of the table is governed by the *block-progression-dimension* trait.

 The CSS2 specification explicitly does not specify what the behavior should be if there is a mismatch between an explicitly specified table block-progression-dimension and the block-progression-dimensions of the content.

 The use of the "proportional-column-width()" function is only permitted when the fixed table layout is used.

If the use of proportional column widths are desired on a table of an unknown explicit width, the inline-progression-dimension cannot be specified to be "auto". Instead, the width must be specified as a percentage. For example, setting table-layout="fixed" and inline-progression-dimension="100%" would allow proportional column widths while simultaneously creating a table as wide as possible in the current context.

 The result of using a percentage for the width may be unpredictable, especially when using the automatic table layout.

It is an error if two or more table-cells overlap, for example because two or more table-cells attempt to span rows or columns into the same cell position within the table grid. An implementation may recover from this error by repositioning the table-cells so that all of the content is shown.

Table-cells must each be entirely contained both horizontally and vertically in a single table-body, table-header or table-footer. It is therefore an error if table-cells attempt to span too far. This might for example happen in a table whose table-layout is fixed by having a number-rows-spanned or number-columns-spanned value larger than the number of available rows or columns in the spanned direction. An implementation may recover by behaving as if the table-cell spanned only as many rows or columns as are actually available.

*Contents:*

(table-column\*, table-header?, table-footer?, table-body+)

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Margin Properties-Block](#) — § 7.11 on page 283
- [Common Relative Position Properties](#) — § 7.13 on page 289
- "block-progression-dimension" — § 7.15.3 on page 308
- "border-after-precedence" — § 7.28.1 on page 382
- "border-before-precedence" — § 7.28.2 on page 383
- "border-collapse" — § 7.28.3 on page 383
- "border-end-precedence" — § 7.28.4 on page 383
- "border-separation" — § 7.28.5 on page 384
- "border-start-precedence" — § 7.28.6 on page 384
- "break-after" — § 7.20.1 on page 343
- "break-before" — § 7.20.2 on page 344
- "clear" — § 7.19.1 on page 337

- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “inline-progression-dimension” — § 7.15.7 on page 312
- “intrusion-displace” — § 7.19.3 on page 342
- “height” — § 7.15.6 on page 311
- “keep-together” — § 7.20.3 on page 344
- “keep-with-next” — § 7.20.4 on page 345
- “keep-with-previous” — § 7.20.5 on page 346
- “table-layout” — § 7.28.16 on page 390
- “table-omit-footer-at-break” — § 7.28.17 on page 390
- “table-omit-header-at-break” — § 7.28.18 on page 390
- “width” — § 7.15.14 on page 317
- “writing-mode” — § 7.29.7 on page 401

#### 6.7.4. fo:table-column

##### *Common Usage:*

The fo:table-column auxiliary formatting object specifies characteristics applicable to table cells that have the same column and span. The most important property is the "column-width" property.

##### *Areas:*

The fo:table-column formatting object does not generate or return any areas. It holds a set of traits that provide constraints on the column widths and a specification of some presentation characteristics, such as background which affects the areas generated by the fo:table (see § 6.7.3 – fo:table on page 157). Inheritable properties may also be specified on the fo:table-column. These can be referenced by the from-table-column() function in an expression.



More details, in particular the use of an fo:table-column with number-columns-spanned greater than 1, are given in the description of fo:table and of the from-table-column() function.

##### *Constraints:*

None.

##### *Contents:*

EMPTY

*The following properties apply to this formatting object:*

- **Common Border, Padding, and Background Properties** — § 7.8 on page 248  
Only the background properties: background-attachment, background-color, background-image, background-repeat, background-position-horizontal, and background-position-vertical from this set apply. If the value of border-collapse is "collapse" or "collapse-with-precedence" for the table the border properties: border-before-color, border-before-style, border-before-width, border-after-color, border-after-style, border-after-width, border-start-color, border-start-style, border-start-width, border-end-color, border-end-style, border-end-width, border-top-color, border-top-style, border-top-width, border-bottom-color, border-bottom-style, border-bottom-width, border-left-color, border-left-style, border-left-width, border-right-color, border-right-style, and border-right-width also apply.
- “border-after-precedence” — § 7.28.1 on page 382
- “border-before-precedence” — § 7.28.2 on page 383

- “border-end-precedence” — § 7.28.4 on page 383
- “border-start-precedence” — § 7.28.6 on page 384
- “column-number” — § 7.28.8 on page 386
- “column-width” — § 7.28.9 on page 386
- “number-columns-repeated” — § 7.28.12 on page 388
- “number-columns-spanned” — § 7.28.13 on page 388
- “visibility” — § 7.30.17 on page 413

### 6.7.5. fo:table-caption

#### *Common Usage:*

The fo:table-caption formatting object is used to contain block-level formatting objects containing the caption for the table only when using the fo:table-and-caption.

#### *Areas:*

The fo:table-caption formatting object generates one or more *normal reference-areas*. The fo:table-caption returns these reference-areas and any *page-level-out-of-line* areas returned by the children of the fo:table-caption.

#### *Constraints:*

For the case when the value of the *caption-side* trait is "before" or "after" the inline-progression-dimension of the content-rectangle of the generated reference-area is equal to the inline-progression-dimension of the content-rectangle of the reference-area that encloses it.

When the value is "start" or "end" the inline-progression-dimension of the generated reference-area is constrained by the value of the *inline-progression-dimension* trait.

When the value is "top", "bottom", "left", or "right" the value is mapped in the same way as for corresponding properties (see § 5.3 – [Computing the Values of Corresponding Properties](#) on page 47) and the property is then treated as if the corresponding value had been specified.

If the caption is to be positioned before the table, the areas generated by the fo:table-caption shall be placed in the area tree as though the fo:table-caption had a "keep-with-next" property with value "always".

If the caption is to be positioned after the table, the areas generated by the fo:table-caption shall be placed in the area tree as though the fo:table-caption had a "keep-with-previous" property with value "always".

No area may have more than one normal child area returned by the same fo:table-caption formatting object.

The children of each normal area returned by an fo:table-caption formatting object must be normal *block-areas* returned by the children of the fo:table-caption, must be *properly stacked*, and must be *properly ordered*.

Any *reference-level-out-of-line* areas returned by the children of the fo:table-caption are handled as described in § 6.12.2 – [fo:float](#) on page 214.

#### *Contents:*

(%block;)+

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “[block-progression-dimension](#)” — § 7.15.3 on page 308
- “[height](#)” — § 7.15.6 on page 311
- “[id](#)” — § 7.30.8 on page 409
- “[index-class](#)” — § 7.24.1 on page 362
- “[index-key](#)” — § 7.24.2 on page 363
- “[inline-progression-dimension](#)” — § 7.15.7 on page 312
- “[intrusion-displace](#)” — § 7.19.3 on page 342
- “[keep-together](#)” — § 7.20.3 on page 344
- “[width](#)” — § 7.15.14 on page 317

### 6.7.6. fo:table-header

*Common Usage:*

The fo:table-header formatting object is used to contain the content of the table header.

*Areas:*

The fo:table-header formatting object does not generate any areas. The fo:table-header formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of the children of the fo:table-header.

*Constraints:*

The order of concatenation of the sequences of areas returned by the children of the fo:table-header is the same order as the children are ordered under the fo:table-header.

*Contents:*

([table-row+](#) | [table-cell+](#))

The fo:table-header has fo:table-row (one or more) as its children, or alternatively fo:table-cell (one or more). In the latter case cells are grouped into rows using the starts-row and ends-row properties.

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248

Only the background properties: background-attachment, background-color, background-image, background-repeat, background-position-horizontal, and background-position-vertical from this set apply. If the value of border-collapse is "collapse" or "collapse-with-precedence" for the table the border properties: border-before-color, border-before-style, border-before-width, border-after-color, border-after-style, border-after-width, border-start-color, border-start-style, border-start-width, border-end-color, border-end-style, border-end-width, border-top-color, border-top-style, border-top-width, border-bottom-color, border-bottom-style, border-bottom-width, border-left-color, border-left-style, border-left-width, border-right-color, border-right-style, and border-right-width also apply.

- [Common Relative Position Properties](#) — § 7.13 on page 289

- “border-after-precedence” — § 7.28.1 on page 382
- “border-before-precedence” — § 7.28.2 on page 383
- “border-end-precedence” — § 7.28.4 on page 383
- “border-start-precedence” — § 7.28.6 on page 384
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “visibility” — § 7.30.17 on page 413

### 6.7.7. fo:table-footer

#### *Common Usage:*

The fo:table-footer formatting object is used to contain the content of the table footer.

#### *Areas:*

The fo:table-footer formatting object does not generate any areas. The fo:table-footer formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of the children of the fo:table-footer.

#### *Constraints:*

The order of concatenation of the sequences of areas returned by the children of the fo:table-footer is the same order as the children are ordered under the fo:table-footer.

#### *Contents:*

(table-row+ | table-cell+)

The fo:table-footer has fo:table-row (one or more) as its children, or alternatively fo:table-cell (one or more). In the latter case cells are grouped into rows using the starts-row and ends-row properties.

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248

Only the background properties: background-attachment, background-color, background-image, background-repeat, background-position-horizontal, and background-position-vertical from this set apply. If the value of border-collapse is "collapse" or "collapse-with-precedence" for the table the border properties: border-before-color, border-before-style, border-before-width, border-after-color, border-after-style, border-after-width, border-start-color, border-start-style, border-start-width, border-end-color, border-end-style, border-end-width, border-top-color, border-top-style, border-top-width, border-bottom-color, border-bottom-style, border-bottom-width, border-left-color, border-left-style, border-left-width, border-right-color, border-right-style, and border-right-width also apply.

- [Common Relative Position Properties](#) — § 7.13 on page 289
- “border-after-precedence” — § 7.28.1 on page 382
- “border-before-precedence” — § 7.28.2 on page 383
- “border-end-precedence” — § 7.28.4 on page 383
- “border-start-precedence” — § 7.28.6 on page 384
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362

- “[index-key](#)” — § 7.24.2 on page 363
- “[visibility](#)” — § 7.30.17 on page 413

### 6.7.8. `fo:table-body`

#### *Common Usage:*

The `fo:table-body` formatting object is used to contain the content of the table body.

#### *Areas:*

The `fo:table-body` formatting object does not generate any areas. The `fo:table-body` formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of the children of the `fo:table-body`.

#### *Constraints:*

The order of concatenation of the sequences of areas returned by the children of the `fo:table-body` is the same order as the children are ordered under the `fo:table-body`.

#### *Contents:*

(`table-row+` | `table-cell+`)

The `fo:table-body` has `fo:table-row` (one or more) as its children, or alternatively `fo:table-cell` (one or more). In the latter case cells are grouped into rows using the `starts-row` and `ends-row` properties.

In addition this formatting object may have a sequence of zero or more `fo:markers` as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
 

Only the background properties: `background-attachment`, `background-color`, `background-image`, `background-repeat`, `background-position-horizontal`, and `background-position-vertical` from this set apply. If the value of `border-collapse` is "collapse" or "collapse-with-precedence" for the table the border properties: `border-before-color`, `border-before-style`, `border-before-width`, `border-after-color`, `border-after-style`, `border-after-width`, `border-start-color`, `border-start-style`, `border-start-width`, `border-end-color`, `border-end-style`, `border-end-width`, `border-top-color`, `border-top-style`, `border-top-width`, `border-bottom-color`, `border-bottom-style`, `border-bottom-width`, `border-left-color`, `border-left-style`, `border-left-width`, `border-right-color`, `border-right-style`, and `border-right-width` also apply.
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “[border-after-precedence](#)” — § 7.28.1 on page 382
- “[border-before-precedence](#)” — § 7.28.2 on page 383
- “[border-end-precedence](#)” — § 7.28.4 on page 383
- “[border-start-precedence](#)” — § 7.28.6 on page 384
- “[id](#)” — § 7.30.8 on page 409
- “[index-class](#)” — § 7.24.1 on page 362
- “[index-key](#)” — § 7.24.2 on page 363
- “[visibility](#)” — § 7.30.17 on page 413

### 6.7.9. fo:table-row

#### *Common Usage:*

The fo:table-row formatting object is used to group table-cells into rows; all table-cells in a table-row start in the same geometric row on the table grid.

#### *Areas:*

The fo:table-row formatting object does not generate any areas. The fo:table-row formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of the children of the fo:table-row. The fo:table-row holds a specification of some presentation characteristics, such as background which affects the areas generated by the fo:table (see § 6.7.3 – fo:table on page 157).

#### *Constraints:*

The order of concatenation of the sequences of areas returned by the children of the fo:table-row is the same order as the children are ordered under the fo:table-row.

The method for determining the height of the row in the grid is governed by the *row-height* trait.

#### *Contents:*

(table-cell+)

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [“block-progression-dimension”](#) — § 7.15.3 on page 308
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248

Only the background properties: background-attachment, background-color, background-image, background-repeat, background-position-horizontal, and background-position-vertical from this set apply. If the value of border-collapse is "collapse" or "collapse-with-precedence" for the table the border properties: border-before-color, border-before-style, border-before-width, border-after-color, border-after-style, border-after-width, border-start-color, border-start-style, border-start-width, border-end-color, border-end-style, border-end-width, border-top-color, border-top-style, border-top-width, border-bottom-color, border-bottom-style, border-bottom-width, border-left-color, border-left-style, border-left-width, border-right-color, border-right-style, and border-right-width also apply.

- [Common Relative Position Properties](#) — § 7.13 on page 289
- [“border-after-precedence”](#) — § 7.28.1 on page 382
- [“border-before-precedence”](#) — § 7.28.2 on page 383
- [“border-end-precedence”](#) — § 7.28.4 on page 383
- [“border-start-precedence”](#) — § 7.28.6 on page 384
- [“break-after”](#) — § 7.20.1 on page 343
- [“break-before”](#) — § 7.20.2 on page 344
- [“id”](#) — § 7.30.8 on page 409
- [“index-class”](#) — § 7.24.1 on page 362
- [“index-key”](#) — § 7.24.2 on page 363
- [“height”](#) — § 7.15.6 on page 311
- [“keep-together”](#) — § 7.20.3 on page 344
- [“keep-with-next”](#) — § 7.20.4 on page 345
- [“keep-with-previous”](#) — § 7.20.5 on page 346

- “visibility” — § 7.30.17 on page 413

### 6.7.10. fo:table-cell

#### *Common Usage:*

The fo:table-cell formatting object is used to group content to be placed in a table cell.

The "starts-row" and "ends-row" properties can be used when the input data does not have elements containing the cells in each row, but instead, for example, each row starts at elements of a particular type.

#### *Areas:*

The fo:table-cell formatting object generates one or more *normal reference-areas*. The fo:table-cell returns these reference-areas and any *page-level-out-of-line* areas returned by the children of the fo:table-cell.

#### *Trait Derivation:*

The method for deriving the border for a cell is specified by the *border-collapse* trait.

If the value of the *border-collapse* trait is "separate" the border is composed of two components. The first, which is placed with the outside edge coincident with the table grid boundary line, has the width of half the value for the *border-separation* trait. It is filled in accordance with the *background* trait of the fo:table. Inside this border is placed, for each side of the cell, a border based on a border specified on the cell or inherited.

If the value of the *border-collapse* trait is "collapse-with-precedence" the border for each side of the cell is determined by, for each segment of a border, selecting, from all border specifications for that segment, the border that has the highest precedence. It is an error if there are two such borders that have the same precedence but are not identical. An implementation may recover by selecting one of the borders. Each border segment is placed centered on the table grid boundary line. On devices that do not support sub-pixel rendering, if an effective border width is determined to be an odd number of pixels it is implementation defined on which side of the grid boundary line the odd pixel is placed.

If the value of the *border-collapse* trait is "collapse", the border for each side of the cell is determined by, for each segment of a border, selecting, from all border specifications for that segment, the border that has the most "eye catching" border style, see below for the details. Each border segment is placed centered on the table grid boundary line. On devices that do not support sub-pixel rendering, if an effective border width is determined to be an odd number of pixels it is implementation defined on which side of the grid boundary line the odd pixel is placed. Where there is a conflict between the styles of border segments that collapse, the following rules determine which border style "wins":

1. Borders with the 'border-style' of 'hidden' take precedence over all other conflicting borders. Any border with this value suppresses all borders at this location.
2. Borders with a style of 'none' have the lowest priority. Only if the border properties of all the elements meeting at this edge are 'none' will the border be omitted (but note that 'none' is the default value for the border style.)
3. If none of the styles is 'hidden' and at least one of them is not 'none', then narrow borders are discarded in favor of wider ones.
4. If the remaining border styles have the same 'border-width' than styles are preferred in this order: 'double', 'solid', 'dashed', 'dotted', 'ridge', 'outset', 'groove', and the lowest: 'inset'.



5. If border styles differ only in color, then a style set on a cell wins over one on a row, which wins over a row group, column, column group and, lastly, table.

*Constraints:*

A table-cell occupies one or more grid units in the row-progression-direction and column-progression-direction. The content-rectangle of the cell is the size of the portion of the grid the cell occupies minus, for each of the four sides:

- If the value of the *border-collapse* trait is "separate": half the value of the *border-separation* trait; otherwise 0.
- If the value of the *border-collapse* trait is "separate": the thickness of the cell-border; otherwise half the thickness of the effective border.
- The cell padding.

The method for determining the block-progression-dimension of the cell in the grid is governed by the *row-height* trait.

No area may have more than one normal child area returned by the same fo:table-cell formatting object.

The children of each normal area returned by an fo:table-cell formatting object must be normal *block-areas* returned by the children of the fo:table-cell, must be *properly stacked*, and must be *properly ordered*.

Any *reference-level-out-of-line* areas returned by the children of the fo:table-cell are handled as described in § 6.12.2 – fo:float on page 214.

*Contents:*

(%block;)+

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

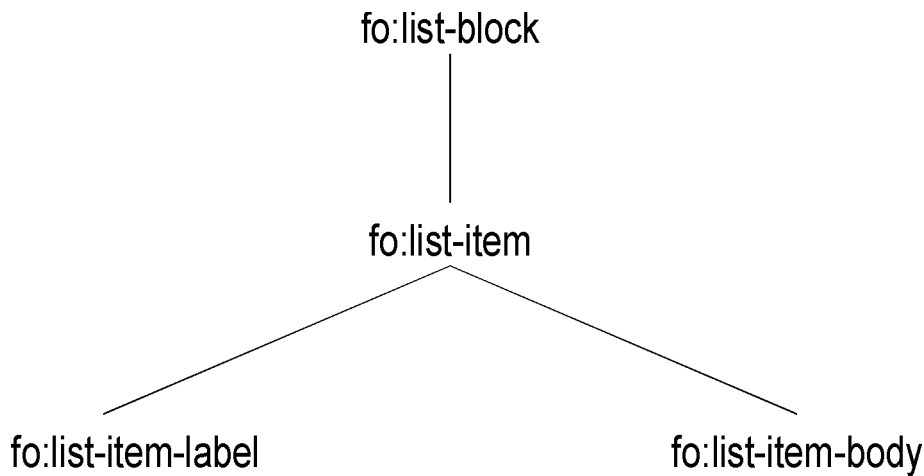
- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “border-after-precedence” — § 7.28.1 on page 382
- “border-before-precedence” — § 7.28.2 on page 383
- “border-end-precedence” — § 7.28.4 on page 383
- “border-start-precedence” — § 7.28.6 on page 384
- “block-progression-dimension” — § 7.15.3 on page 308
- “column-number” — § 7.28.8 on page 386
- “display-align” — § 7.14.4 on page 303
- “relative-align” — § 7.14.6 on page 306
- “empty-cells” — § 7.28.10 on page 387
- “ends-row” — § 7.28.11 on page 388
- “height” — § 7.15.6 on page 311
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “inline-progression-dimension” — § 7.15.7 on page 312

- “number-columns-spanned” — § 7.28.13 on page 388
- “number-rows-spanned” — § 7.28.14 on page 389
- “starts-row” — § 7.28.15 on page 389
- “width” — § 7.15.14 on page 317

## 6.8. Formatting Objects for Lists

### 6.8.1. Introduction

There are four formatting objects used to construct lists: fo:list-block, fo:list-item, fo:list-item-label, and fo:list-item-body.



**Tree representation of the formatting Objects for Lists.**

The fo:list-block has the role of containing the complete list and of specifying values used for the list geometry in the inline-progression-direction (see details below).

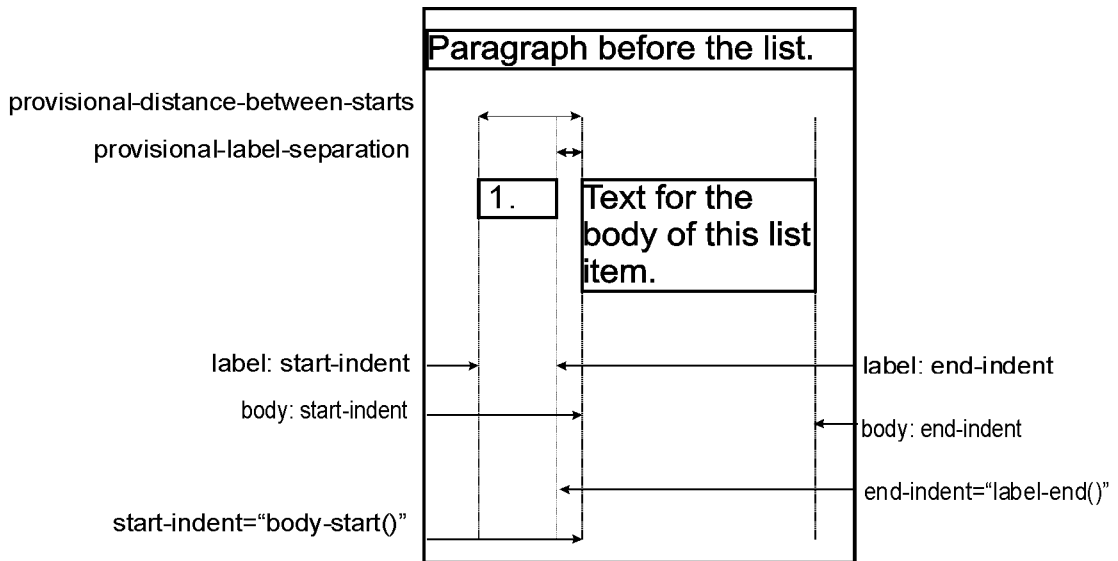
The children of the fo:list-block are one or more fo:list-item, each containing a pair of fo:list-item-label and fo:list-item-body.

The fo:list-item has the role of containing each item in a list.

The fo:list-item-label has the role of containing the content, block-level formatting objects, of the label for the list-item; typically an fo:block containing a number, a dingbat character, or a term.

The fo:list-item-body has the role of containing the content, block-level formatting objects, of the body of the list-item; typically one or more fo:block.

The placement, in the block-progression-direction, of the label with respect to the body is made in accordance with the "vertical-align" property of the fo:list-item.



The specification of the list geometry in the inline-progression-direction is achieved by:

- Specifying appropriate values of the "provisional-distance-between-starts" and "provisional-label-separation" properties. The "provisional-distance-between-starts" specifies the desired distance between the start-indents of the label and the body of the list-item. The "provisional-label-separation" specifies the desired separation between the end-indent of the label and the start-indent of the body of the list-item.
- Specifying end-indent="label-end()" on the fo:list-item-label.  
Specifying start-indent="body-start()" on the fo:list-item-body.

☞ These list specific functions are defined in § 7.30.11 – “provisional-label-separation” on page 411 and § 7.30.12 – “provisional-distance-between-starts” on page 411.

The start-indent of the list-item-label and end-indent of the list-item-body, if desired, are typically specified as a length.

### 6.8.1.1. Examples

#### 6.8.1.1.1. Enumerated List

The list-items are contained in an "ol" element. The items are contained in "item" elements and contain text (as opposed to paragraphs).

The style is to enumerate the items alphabetically with a dot after the letter.

Input sample:

```
<ol>
<item>List item 1.</item>
<item>List item 2.</item>
<item>List item 3.</item>
</ol>
```

**XSL Stylesheet:**

```

<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                xmlns:fo="http://www.w3.org/1999/XSL/Format"
                version='1.0'>

<xsl:template match="ol">
  <fo:list-block provisional-distance-between-starts="15mm"
    provisional-label-separation="5mm">
    <xsl:apply-templates/>
  </fo:list-block>
</xsl:template>

<xsl:template match="ol/item">
  <fo:list-item>
    <fo:list-item-label start-indent="5mm" end-indent="label-end(">
      <fo:block>
        <xsl:number format="a."/>
      </fo:block>
    </fo:list-item-label>
    <fo:list-item-body start-indent="body-start(">
      <fo:block>
        <xsl:apply-templates/>
      </fo:block>
    </fo:list-item-body>
  </fo:list-item>
</xsl:template>

</xsl:stylesheet>

```

**Result Instance: elements and attributes in the fo: namespace**

```

<fo:list-block provisional-distance-between-starts="15mm"
  provisional-label-separation="5mm">

  <fo:list-item>
    <fo:list-item-label start-indent="5mm" end-indent="label-end(">
      <fo:block>a.
    </fo:block>
    </fo:list-item-label>
    <fo:list-item-body start-indent="body-start(">
      <fo:block>List item 1.
    </fo:block>
    </fo:list-item-body>
  </fo:list-item>

```

```

<fo:list-item>
  <fo:list-item-label start-indent="5mm" end-indent="label-end()">
    <fo:block>b.
  </fo:block>
</fo:list-item-label>
  <fo:list-item-body start-indent="body-start()">
    <fo:block>List item 2.
  </fo:block>
</fo:list-item-body>
</fo:list-item>

```

```

<fo:list-item>
  <fo:list-item-label start-indent="5mm" end-indent="label-end()">
    <fo:block>c.
  </fo:block>
</fo:list-item-label>
  <fo:list-item-body start-indent="body-start()">
    <fo:block>List item 3.
  </fo:block>
</fo:list-item-body>
</fo:list-item>

```

```
</fo:list-block>
```

#### 6.8.1.1.2. HTML-style "dl" lists

In this example the stylesheet processes HTML-style "dl" lists, which contain unwrapped pairs of "dt" and "dd" elements, transforming them into fo:list-blocks.

Balanced pairs of "dt"/"dd"s are converted into fo:list-items. For unbalanced "dt"/"dd"s, the stylesheet makes the following assumptions:

- Multiple "dt"s are grouped together into a single fo:list-item-label in a single list-item.
- Multiple DDs are:
  - Output as individual FO list-items with an empty list-item-label if the stylesheet variable \$allow-naked-dd is true.
  - Are grouped together into a single FO list-item-body if \$allow-naked-dd is false.

In other words, given a structure like this:

```

<doc>
<dl>
  <dt>term</dt>
  <dd>definition</dd>
  <dt>term</dt>
  <dt>term</dt>
  <dd>definition</dd>
  <dt>term</dt>

```

```

    <dd>definition</dd>
    <dd>definition</dd>
</dl>
</doc>

```

If `$allow-naked-dd` is true, the result instance: elements and attributes in the fo: namespace is:

```

<fo:list-block provisional-distance-between-starts="35mm"
  provisional-label-separation="5mm">
  <fo:list-item>
    <fo:list-item-label end-indent="label-end()">
      <fo:block>term
    </fo:block>
    </fo:list-item-label>
    <fo:list-item-body start-indent="body-start()">
      <fo:block>definition
    </fo:block>
    </fo:list-item-body>
  </fo:list-item>
  <fo:list-item>
    <fo:list-item-label end-indent="label-end()">
      <fo:block>term
    </fo:block>
      <fo:block>term
    </fo:block>
    </fo:list-item-label>
    <fo:list-item-body start-indent="body-start()">
      <fo:block>definition
    </fo:block>
    </fo:list-item-body>
  </fo:list-item>
  <fo:list-item>
    <fo:list-item-label end-indent="label-end()">
      <fo:block>term
    </fo:block>
    </fo:list-item-label>
    <fo:list-item-body start-indent="body-start()">
      <fo:block>definition
    </fo:block>
    </fo:list-item-body>
  </fo:list-item>
  <fo:list-item>
    <fo:list-item-label end-indent="label-end()">
      <fo:block>term
    </fo:block>
    </fo:list-item-label>
    <fo:list-item-body start-indent="body-start()">
      <fo:block>definition
    </fo:block>
  </fo:list-item>

```

```

    </fo:block>
  </fo:list-item-body>
</fo:list-item>
</fo:list-block>

```

If \$allow-naked-dd is false, the result instance: elements and attributes in the fo: namespace is:

```

<fo:list-block provisional-distance-between-starts="35mm"
  provisional-label-separation="5mm">
  <fo:list-item>
    <fo:list-item-label end-indent="label-end()">
      <fo:block>term
    </fo:block>
    </fo:list-item-label>
    <fo:list-item-body start-indent="body-start()">
      <fo:block>definition
    </fo:block>
    </fo:list-item-body>
  </fo:list-item>
  <fo:list-item>
    <fo:list-item-label end-indent="label-end()">
      <fo:block>term
    </fo:block>
      <fo:block>term
    </fo:block>
    </fo:list-item-label>
    <fo:list-item-body start-indent="body-start()">
      <fo:block>definition
    </fo:block>
    </fo:list-item-body>
  </fo:list-item>
  <fo:list-item>
    <fo:list-item-label end-indent="label-end()">
      <fo:block>term
    </fo:block>
    </fo:list-item-label>
    <fo:list-item-body start-indent="body-start()">
      <fo:block>definition
    </fo:block>
      <fo:block>definition
    </fo:block>
    </fo:list-item-body>
  </fo:list-item>
</fo:list-block>

```

**XSL Stylesheet:**

```
<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                xmlns:fo="http://www.w3.org/1999/XSL/Format"
                version='1.0'>

<xsl:include href="dtdd.xsl"/>

<xsl:template match="doc">
  <xsl:apply-templates/>
</xsl:template>

<xsl:template match="dl">
  <xsl:call-template name="process.dl"/>
</xsl:template>

<xsl:template match="dt|dd">
  <fo:block>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

</xsl:stylesheet>
```

**Included stylesheet "dtdd.xsl"**

```
<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                xmlns:fo="http://www.w3.org/1999/XSL/Format"
                version='1.0'>

<xsl:variable name="allow-naked-dd" select="true()"/>

<xsl:template name="process.dl">
  <fo:list-block provisional-distance-between-starts="35mm"
    provisional-label-separation="5mm">
    <xsl:choose>
      <xsl:when test="$allow-naked-dd">
        <xsl:call-template name="process.dl.content.with.naked.dd"/>
      </xsl:when>
      <xsl:otherwise>
        <xsl:call-template name="process.dl.content"/>
      </xsl:otherwise>
    </xsl:choose>
  </fo:list-block>
</xsl:template>
```



```
<xsl:template name="process.dl.content.with.naked.dd">
  <xsl:param name="dts" select="./force-list-to-be-empty"/>
  <xsl:param name="nodes" select="*" />

  <xsl:choose>
    <xsl:when test="count($nodes)=0">
      <!-- Out of nodes, output any pending DTs -->
      <xsl:if test="count($dts)>0">
        <fo:list-item>
          <fo:list-item-label end-indent="label-end()">
            <xsl:apply-templates select="$dts"/>
          </fo:list-item-label>
          <fo:list-item-body start-indent="body-start()" />
        </fo:list-item>
      </xsl:if>
    </xsl:when>

    <xsl:when test="name($nodes[1])='dd'">
      <!-- We found a DD, output the DTs and the DD -->
      <fo:list-item>
        <fo:list-item-label end-indent="label-end()">
          <xsl:apply-templates select="$dts"/>
        </fo:list-item-label>
        <fo:list-item-body start-indent="body-start()">
          <xsl:apply-templates select="$nodes[1]" />
        </fo:list-item-body>
      </fo:list-item>
      <xsl:call-template name="process.dl.content.with.naked.dd">
        <xsl:with-param name="nodes" select="$nodes[position()>1]" />
      </xsl:call-template>
    </xsl:when>

    <xsl:when test="name($nodes[1])='dt'">
      <!-- We found a DT, add it to the list of DTs and loop -->
      <xsl:call-template name="process.dl.content.with.naked.dd">
        <xsl:with-param name="dts" select="$dts|$nodes[1]" />
        <xsl:with-param name="nodes" select="$nodes[position()>1]" />
      </xsl:call-template>
    </xsl:when>

    <xsl:otherwise>
      <!-- This shouldn't happen -->
      <xsl:message>
        <xsl:text>DT/DD list contained something bogus (</xsl:text>

```

```

        <xsl:value-of select="name($nodes[1])"/>
        <xsl:text>).</xsl:text>
    </xsl:message>
</xsl:otherwise>
</xsl:choose>
</xsl:template>

<xsl:template name="process.dl.content">
    <xsl:param name="dts" select="./force-list-to-be-empty"/>
    <xsl:param name="dds" select="./force-list-to-be-empty"/>
    <xsl:param name="output-on"></xsl:param>
    <xsl:param name="nodes" select="*" />

    <!-- The algorithm here is to build up a list of DTs and DDs, -->
    <!-- outputing them only on the transition from DD back to DT -->

    <xsl:choose>
        <xsl:when test="count($nodes)=0">
            <!-- Out of nodes, output any pending elements -->
            <xsl:if test="count($dts)>0 or count($dds)>0">
                <fo:list-item>
                    <fo:list-item-label end-indent="label-end()">
                        <xsl:apply-templates select="$dts"/>
                    </fo:list-item-label>
                    <fo:list-item-body start-indent="body-start()">
                        <xsl:apply-templates select="$dds"/>
                    </fo:list-item-body>
                </fo:list-item>
            </xsl:if>
        </xsl:when>

        <xsl:when test="name($nodes[1])=$output-on">
            <!-- We're making the transition from DD back to DT -->
            <fo:list-item>
                <fo:list-item-label end-indent="label-end()">
                    <xsl:apply-templates select="$dts"/>
                </fo:list-item-label>
                <fo:list-item-body start-indent="body-start()">
                    <xsl:apply-templates select="$dds"/>
                </fo:list-item-body>
            </fo:list-item>

            <!-- Reprocess this node (and the rest of the node list) -->
            <!-- resetting the output-on state to nil -->
            <xsl:call-template name="process.dl.content">

```

```

        <xsl:with-param name="nodes" select="$nodes" />
    </xsl:call-template>
</xsl:when>

<xsl:when test="name($nodes[1])='dt'">
    <!-- We found a DT, add it to the list and loop -->
    <xsl:call-template name="process.dl.content">
        <xsl:with-param name="dts" select="$dts|$nodes[1]" />
        <xsl:with-param name="dds" select="$dds" />
        <xsl:with-param name="nodes" select="$nodes[position()>1]" />
    </xsl:call-template>
</xsl:when>

<xsl:when test="name($nodes[1])='dd'">
    <!-- We found a DD, add it to the list and loop, noting that -->
    <!-- the next time we cross back to DT's, we need to output the -->
    <!-- current DT/DDs. -->
    <xsl:call-template name="process.dl.content">
        <xsl:with-param name="dts" select="$dts" />
        <xsl:with-param name="dds" select="$dds|$nodes[1]" />
        <xsl:with-param name="output-on">dt</xsl:with-param>
        <xsl:with-param name="nodes" select="$nodes[position()>1]" />
    </xsl:call-template>
</xsl:when>

<xsl:otherwise>
    <!-- This shouldn't happen -->
    <xsl:message>
        <xsl:text>DT/DD list contained something bogus (</xsl:text>
        <xsl:value-of select="name($nodes[1])" />
        <xsl:text>).</xsl:text>
    </xsl:message>
</xsl:otherwise>
</xsl:choose>
</xsl:template>

</xsl:stylesheet>

```

The "dtd.xsl" stylesheet may be customized in the following ways:

- Set the value of `$allow-naked-dd` to control the processing of unbalanced "dd"s.
- Change "dt" to the name of the element which is a term in the list.
- Change "dd" to the name of the element which is a definition in the list.
- In the, perhaps unlikely, event that the documents may contain an element named "force-list-to-be-empty", that element name should be changed to a name that is not used in the documents.

In the stylesheet using the "dtd.xsl" stylesheet change the "dl" to the name of the element which is the wrapper for the list.

### 6.8.2. fo:list-block

*Common Usage:*

The fo:list-block flow object is used to format a list.

*Areas:*

The fo:list-block formatting object generates one or more *normal block-areas*. The fo:list-block returns these areas, any *page-level-out-of-line* areas, and any *reference-level-out-of-line* areas returned by the children of the fo:list-block.

*Constraints:*

No area may have more than one normal child area returned by the same fo:list-block formatting object.

The children of each normal area returned by an fo:list-block formatting object must be normal *block-areas* returned by the children of the fo:list-block, must be *properly stacked*, and must be *properly ordered*.

*Contents:*

(`list-item+`)

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Margin Properties-Block](#) — § 7.11 on page 283
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “break-after” — § 7.20.1 on page 343
- “break-before” — § 7.20.2 on page 344
- “clear” — § 7.19.1 on page 337
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “intrusion-displace” — § 7.19.3 on page 342
- “keep-together” — § 7.20.3 on page 344
- “keep-with-next” — § 7.20.4 on page 345
- “keep-with-previous” — § 7.20.5 on page 346
- “provisional-distance-between-starts” — § 7.30.12 on page 411
- “provisional-label-separation” — § 7.30.11 on page 411

### 6.8.3. fo:list-item

*Common Usage:*

The fo:list-item formatting object contains the label and the body of an item in a list.

*Areas:*

The fo:list-item formatting object generates one or more *normal block-areas*. The fo:list-item returns these areas, any *page-level-out-of-line* areas, and any *reference-level-out-of-line* areas returned by the children of the fo:list-item.

*Constraints:*

No area may have more than one normal child area returned by the same fo:list-item formatting object.

The children of each normal area returned by an fo:list-item formatting object must be normal *block-areas* returned by the fo:list-item-label and the fo:list-item-body flow objects and must be *properly ordered*. Those returned by the fo:list-item-label must be *properly stacked* and those returned by the fo:list-item-body must be *properly stacked*.

The children of each normal area returned by an fo:list-item formatting object returned by the fo:list-item-label and fo:list-item-body objects are positioned in the block-progression-direction with respect to each other according to the *relative-align* trait.

In the inline-progression-direction these areas are positioned in the usual manner for properly stacked areas. It is an error if the content-rectangles of the areas overlap.

The block-progression-dimension of the content-rectangle of an area generated by the fo:list-item is just large enough so that the allocation-rectangles of all its child areas are contained in it. In particular, the space-before and space-after of the child areas have no effect on the spacing of the list item. For purposes of the block-stacking constraints the areas generated by fo:list-item are treated as if there they have a fence preceding and a fence following them.



These areas are not reference-areas, hence the indents on all objects within them are measured relative to the reference-area that holds the content of the fo:list-block.

*Contents:*

([list-item-label](#), [list-item-body](#))

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Margin Properties-Block](#) — § 7.11 on page 283
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “break-after” — § 7.20.1 on page 343
- “break-before” — § 7.20.2 on page 344
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “intrusion-displace” — § 7.19.3 on page 342
- “keep-together” — § 7.20.3 on page 344
- “keep-with-next” — § 7.20.4 on page 345
- “keep-with-previous” — § 7.20.5 on page 346
- “relative-align” — § 7.14.6 on page 306

#### 6.8.4. fo:list-item-body

##### *Common Usage:*

The fo:list-item-body formatting object contains the content of the body of a list-item.

##### *Areas:*

The fo:list-item-body formatting object does not generate any areas. The fo:list-item-body formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of the children of the fo:list-item-body.

##### *Constraints:*

The order of concatenation of the sequences of areas returned by the children of the fo:list-item-body is the same order as the children are ordered under the fo:list-item-body.

##### *Contents:*

(%block;)+

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “keep-together” — § 7.20.3 on page 344

#### 6.8.5. fo:list-item-label

##### *Common Usage:*

The fo:list-item-label formatting object contains the content of the label of a list-item, typically used to either enumerate, identify, or adorn the list-item's body.

##### *Areas:*

The fo:list-item-label formatting object does not generate any areas. The fo:list-item-label formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of the children of the fo:list-item-label.

##### *Constraints:*

The order of concatenation of the sequences of areas returned by the children of the fo:list-item-label is the same order as the children are ordered under the fo:list-item-label.

##### *Contents:*

(%block;)+

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362

- “index-key” — § 7.24.2 on page 363
- “keep-together” — § 7.20.3 on page 344

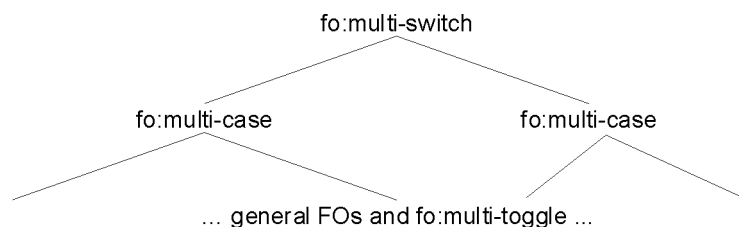
## 6.9. Dynamic Effects: Link and Multi Formatting Objects

### 6.9.1. Introduction

Dynamic effects, whereby user actions (including User Agent state) can influence the behavior and/or representation of portions of a document, can be achieved through the use of the formatting objects included in this section:

- One-directional single-target links.
- The ability to switch between the display of two or more formatting object subtrees. This can be used for, e.g., expandable/collapsible table of contents, display of an icon or a full table or graphic.
- The ability to switch between different property values, such as color or font-weight, depending on a User Agent state, such as "hover".

The switching between subtrees is achieved by using the following three formatting objects: fo:multi-switch, fo:multi-case, and fo:multi-toggle. The result tree structure is shown below.



**Tree Representation of the Multi Formatting Objects**

The role of the fo:multi-switch is to wrap fo:multi-case formatting objects, each containing a subtree. Each subtree is given a name on the fo:multi-case formatting object. Activating, for example implemented as clicking on, an fo:multi-toggle causes a named subtree, the previous, the next, or "any" subtree to be displayed; controlled by the "switch-to" property. For "any", an implementation would typically present a list of choices each labeled using the "case-title" property of the fo:multi-case. The initial subtree displayed is controlled by the "starting-state" property on the fo:multi-case.

Switching between different property values is achieved by using the fo:multi-properties and fo:multi-property-set formatting objects, and the merge-property-values() function. For example, an fo:multi-property-set can be used to specify various properties for each of the possible values of the active-state property, and merge-property-values() can be used to apply them on a given formatting object.

#### 6.9.1.1. Examples

##### 6.9.1.1.1. Expandable/Collapsible Table of Contents

Input sample:

```

<doc>
  <chapter><title>Chapter</title>
    <p>Text</p>
  <section><title>Section</title>

```

```

    <p>Text</p>
  </section>
  <section><title>Section</title>
  <p>Text</p>
</section>
</chapter>
<chapter><title>Chapter</title>
  <p>Text</p>
  <section><title>Section</title>
  <p>Text</p>
</section>
  <section><title>Section</title>
  <p>Text</p>
</section>
</chapter>
</doc>

```

In this example the chapter and section titles are extracted into a table of contents placed at the front of the result. The chapter titles are preceded by an icon indicating either collapsed or expanded state. The section titles are only shown in the expanded state. Furthermore, there are links from the titles in the table of contents to the corresponding titles in the body of the document.

The two states are achieved by, for each chapter title, using an `fo:multi-switch` with a `fo:multi-case` for each state. The icon is contained in an `fo:multi-toggle` with the appropriate `fo:multi-case` "switch-to" property to select the other state.

The links in the table of contents are achieved by adding a unique id on the title text in the body of the document and wrapping the title text in the table of contents in an `fo:basic-link` referring to that id.

#### XSL Stylesheet:

```

<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:fo="http://www.w3.org/1999/XSL/Format"
  version='1.0'>

<xsl:template match="doc">
  <!-- create the table of contents -->
  <xsl:apply-templates select="chapter/title" mode="toc"/>
  <!-- do the document -->
  <xsl:apply-templates/>
</xsl:template>

<xsl:template match="chapter/title" mode="toc">
  <fo:multi-switch>
    <fo:multi-case case-name="collapsed" case-title="collapsed"
  starting-state="show">
      <fo:block>
        <fo:multi-toggle switch-to="expanded">

```



```

        <fo:external-graphic href="plus-icon.gif"/>
    </fo:multi-toggle>
    <fo:basic-link internal-destination="{generate-id(.)}">
        <xsl:number level="multiple" count="chapter" format="1. " />
        <xsl:apply-templates mode="toc"/>
    </fo:basic-link>
</fo:block>
</fo:multi-case>
<fo:multi-case case-name="expanded" case-title="expanded"
starting-state="hide">
    <fo:block>
        <fo:multi-toggle switch-to="collapsed">
            <fo:external-graphic href="minus-icon.gif"/>
        </fo:multi-toggle>
        <fo:basic-link internal-destination="{generate-id(.)}">
            <xsl:number level="multiple" count="chapter" format="1. " />
            <xsl:apply-templates mode="toc"/>
        </fo:basic-link>
    </fo:block>
    <xsl:apply-templates select="../section/title" mode="toc"/>
</fo:multi-case>
</fo:multi-switch>
</xsl:template>

<xsl:template match="section/title" mode="toc">
    <fo:block start-indent="10mm">
        <fo:basic-link internal-destination="{generate-id(.)}">
            <xsl:number level="multiple" count="chapter|section" format="1.1 " />
            <xsl:apply-templates/>
        </fo:basic-link>
    </fo:block>
</xsl:template>

<xsl:template match="chapter/title">
    <fo:block id="{generate-id(.)}">
        <xsl:number level="multiple" count="chapter" format="1. " />
        <xsl:apply-templates/>
    </fo:block>
</xsl:template>

<xsl:template match="section/title">
    <fo:block id="{generate-id(.)}">
        <xsl:number level="multiple" count="chapter|section" format="1.1 " />
        <xsl:apply-templates/>
    </fo:block>

```

```
</xsl:template>
```

```
<xsl:template match="p">
  <fo:block>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>
```

```
</xsl:stylesheet>
```

### Result Instance: elements and attributes in the fo: namespace

```
<fo:multi-switch>
  <fo:multi-case case-name="collapsed" case-title="collapsed"
starting-state="show">
  <fo:block>
    <fo:multi-toggle switch-to="expanded">
      <fo:external-graphic href="plus-icon.gif">
      </fo:external-graphic>
    </fo:multi-toggle>
    <fo:basic-link internal-destination="N4">1. Chapter
    </fo:basic-link>
  </fo:block>
</fo:multi-case>
<fo:multi-case case-name="expanded" case-title="expanded" starting-state="hide">
  <fo:block>
    <fo:multi-toggle switch-to="collapsed">
      <fo:external-graphic href="minus-icon.gif">
      </fo:external-graphic>
    </fo:multi-toggle>
    <fo:basic-link internal-destination="N4">1. Chapter
    </fo:basic-link>
  </fo:block>
  <fo:block start-indent="10mm">
    <fo:basic-link internal-destination="N11">1.1 Section
    </fo:basic-link>
  </fo:block>
  <fo:block start-indent="10mm">
    <fo:basic-link internal-destination="N19">1.2 Section
    </fo:basic-link>
  </fo:block>
</fo:multi-case>
</fo:multi-switch>
<fo:multi-switch>
  <fo:multi-case case-name="collapsed" case-title="collapsed"
starting-state="show">
```

```
<fo:block>
  <fo:multi-toggle switch-to="expanded">
    <fo:external-graphic href="plus-icon.gif">
    </fo:external-graphic>
  </fo:multi-toggle>
  <fo:basic-link internal-destination="N28">2. Chapter
  </fo:basic-link>
</fo:block>
</fo:multi-case>
<fo:multi-case case-name="expanded" case-title="expanded" starting-state="hide">
  <fo:block>
    <fo:multi-toggle switch-to="collapsed">
      <fo:external-graphic href="minus-icon.gif">
      </fo:external-graphic>
    </fo:multi-toggle>
    <fo:basic-link internal-destination="N28">2. Chapter
    </fo:basic-link>
  </fo:block>
  <fo:block start-indent="10mm">
    <fo:basic-link internal-destination="N35">2.1 Section
    </fo:basic-link>
  </fo:block>
  <fo:block start-indent="10mm">
    <fo:basic-link internal-destination="N43">2.2 Section
    </fo:basic-link>
  </fo:block>
</fo:multi-case>
</fo:multi-switch>

<fo:block id="N4">1. Chapter
</fo:block>
<fo:block>Text
</fo:block>
<fo:block id="N11">1.1 Section
</fo:block>
<fo:block>Text
</fo:block>
<fo:block id="N19">1.2 Section
</fo:block>
<fo:block>Text
</fo:block>
<fo:block id="N28">2. Chapter
</fo:block>
<fo:block>Text
</fo:block>
```

```

<fo:block id="N35">2.1 Section
</fo:block>
<fo:block>Text
</fo:block>
<fo:block id="N43">2.2 Section
</fo:block>
<fo:block>Text
</fo:block>

```

### 6.9.1.1.2. Styling an XLink Based on the Active State

Input sample:

```

<p>Follow this <xlink:mylink xmlns:xlink="http://www.w3.org/1999/xlink"
  xlink:href="http://www.w3.org/TR"
  xlink:title="An Example"
  xlink:show="new"
  xlink:actuate="onRequest">link</xlink:mylink> to access all
TRs of the W3C.</p>

```

In this example an `fo:basic-link` contains a series of `fo:multi-property-sets` that specify various colors or text-decorations depending on the active state, and a wrapper around the `fo:basic-link` that allows for the merging of the properties of the `fo:multi-properties` with those of the appropriate `fo:multi-property-sets`.

XSL Stylesheet:

```

<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:fo="http://www.w3.org/1999/XSL/Format"
  version='1.0'>

<xsl:template match="p">
  <fo:block>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="xlink:mylink" xmlns:xlink="http://www.w3.org/1999/xlink">
  <xsl:variable name="show"><xsl:value-of select="@xlink:show"/>
</xsl:variable>
  <fo:multi-properties text-decoration="underline">
    <fo:multi-property-set active-state="link" color="blue"/>
    <fo:multi-property-set active-state="visited" color="red"/>
    <fo:multi-property-set active-state="active" color="green"/>
    <fo:multi-property-set active-state="hover" text-decoration="blink"/>
    <fo:multi-property-set active-state="focus" color="yellow"/>
    <fo:wrapper color="merge-property-values()"
      text-decoration="merge-property-values()">
      <fo:basic-link external-destination="http://www.w3.org/TR"

```

```

        show-destination="{ $show }">
      <xsl:attribute name="role">
        <xsl:value-of select="@xlink:title"/>
      </xsl:attribute>
      <xsl:apply-templates/>
    </fo:basic-link>
  </fo:wrapper>
</fo:multi-properties>
</xsl:template>

</xsl:stylesheet>

```

### Result Instance: elements and attributes in the fo: namespace

```

<fo:block>Follow this
  <fo:multi-properties text-decoration="underline">
    <fo:multi-property-set active-state="link" color="blue">
    </fo:multi-property-set>
    <fo:multi-property-set active-state="visited" color="red">
    </fo:multi-property-set>
    <fo:multi-property-set active-state="active" color="green">
    </fo:multi-property-set>
    <fo:multi-property-set active-state="hover" text-decoration="blink">
    </fo:multi-property-set>
    <fo:multi-property-set active-state="focus" color="yellow">
    </fo:multi-property-set>
    <fo:wrapper color="merge-property-values()"
      text-decoration="merge-property-values()">
      <fo:basic-link external-destination="http://www.w3.org/TR"
        show-destination="new" role="An Example">link
      </fo:basic-link>
    </fo:wrapper>
  </fo:multi-properties> to access all
  TRs of the W3C.
</fo:block>

```


## 6.9.2. fo:basic-link

### Common Usage:

The fo:basic-link is used for representing the start resource of a simple one-directional single-target link. The object allows for traversal to the destination resource, typically by clicking on any of the containing areas.

### Areas:

The fo:basic-link formatting object generates one or more *normal* inline-areas. The fo:basic-link returns these areas, together with any *normal* block-areas, *page-level-out-of-line* areas, and *reference-level-out-of-line* areas returned by the children of the fo:basic-link.

 An fo:basic-link can be enclosed in an fo:block to create a display area.

#### *Constraints:*

One of the external-destination and internal-destination properties should be specified. If both are specified, the system may either report it as an error, or use the internal-destination property.

No area may have more than one normal child area returned by the same fo:basic-link formatting object.

The children of each normal area returned by an fo:basic-link must satisfy the constraints specified in § 4.7.3 – [Inline-building](#) on page 39.

#### *Contents:*

```
(#PCDATA|%inline;|%block;)*
```

In addition this formatting object may have a sequence of zero or more fo:markers as its initial children.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [Common Border, Padding, and Background Properties](#) — § 7.8 on page 248
- [Common Margin Properties-Inline](#) — § 7.12 on page 288
- [Common Relative Position Properties](#) — § 7.13 on page 289
- “[alignment-adjust](#)” — § 7.14.1 on page 298
- “[alignment-baseline](#)” — § 7.14.2 on page 300
- “[baseline-shift](#)” — § 7.14.3 on page 301
- “[destination-placement-offset](#)” — § 7.23.5 on page 357
- “[dominant-baseline](#)” — § 7.14.5 on page 303
- “[external-destination](#)” — § 7.23.6 on page 357
- “[id](#)” — § 7.30.8 on page 409
- “[index-class](#)” — § 7.24.1 on page 362
- “[index-key](#)” — § 7.24.2 on page 363
- “[indicate-destination](#)” — § 7.23.7 on page 358
- “[internal-destination](#)” — § 7.23.8 on page 358
- “[keep-together](#)” — § 7.20.3 on page 344
- “[keep-with-next](#)” — § 7.20.4 on page 345
- “[keep-with-previous](#)” — § 7.20.5 on page 346
- “[line-height](#)” — § 7.16.4 on page 319
- “[show-destination](#)” — § 7.23.9 on page 358
- “[target-processing-context](#)” — § 7.23.13 on page 361
- “[target-presentation-context](#)” — § 7.23.12 on page 360
- “[target-style-sheet](#)” — § 7.23.14 on page 361


### **6.9.3. fo:multi-switch**

#### *Common Usage:*

The fo:multi-switch wraps the specification of alternative sub-trees of formatting objects (each sub-tree being within an fo:multi-case), and controls the switching (activated via fo:multi-toggle) from one alternative to another.

The direct children of an `fo:multi-switch` object are `fo:multi-case` objects. Only a single `fo:multi-case` may be visible at a single time. The user may switch between the available multi-cases.

Each `fo:multi-case` may contain one or more `fo:multi-toggle` objects, which controls the `fo:multi-case` switching of the `fo:multi-switch`.

 An `fo:multi-switch` can be used for many interactive tasks, such as table-of-content views, embedding link targets, or generalized (even multi-layered hierarchical), next/previous views. The latter are today normally handled in HTML by next/previous links to other documents, forcing the whole document to be replaced whenever the users decides to move on.

#### *Areas:*


The `fo:multi-switch` formatting object does not generate any areas. The `fo:multi-switch` formatting object returns the sequence of areas returned by the currently visible `fo:multi-case`. If there is no currently visible `fo:multi-case` no areas are returned.

#### *Trait Derivation:*


The *currently-visible-multi-case* trait has as its initial value a reference to the first `fo:multi-case` child that has a value of "show" of the *starting-state* trait. If there is no such child, it has a value indicating that there is no currently visible `fo:multi-case`. When an `fo:multi-toggle` is actuated, its closest ancestral `fo:multi-switch`'s *currently-visible-multi-case* trait value changes to refer to the `fo:multi-case` selected by the "switch-to" property value of the `fo:multi-toggle`. Once the *currently-visible-multi-case* trait gets a value indicating that there is no currently visible `fo:multi-case`, it becomes impossible to actuate an `fo:multi-toggle` in this `fo:multi-switch`.

#### *Constraints:*

The order of the sequence of areas returned by the `fo:multi-switch` is the same as the order of the areas returned by the currently visible `fo:multi-case`.

 Any number of the `fo:multi-case` objects may assign "starting-state" to "show".

If no `fo:multi-case` has "starting-state" property value of "show", the contents of no `fo:multi-case` should be displayed.

 If no multi-case is displayed, the entire `fo:multi-switch` will effectively be hidden.

#### *Contents:*

(`multi-case+`)

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- "auto-restore" — § 7.23.2 on page 356
- "id" — § 7.30.8 on page 409
- "index-class" — § 7.24.1 on page 362
- "index-key" — § 7.24.2 on page 363

### 6.9.4. fo:multi-case

#### Common Usage:

The fo:multi-case is used to contain (within an fo:multi-switch) each alternative sub-tree of formatting objects among which the parent fo:multi-switch will choose one to show and will hide the rest.

#### Areas:

The fo:multi-case formatting object does not generate any areas. The fo:multi-case formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of the children of the fo:multi-case.

#### Constraints:

The order of concatenation of the sequences of areas returned by the children of the fo:multi-case is the same order as the children are ordered under the fo:multi-case.

#### Contents:

```
(#PCDATA | %inline; | %block; ) *
```

An fo:multi-case is only permitted to have children that would be permitted to be children of the parent of the fo:multi-switch that is the parent of the fo:multi-case, except that an fo:multi-case may not contain fo:marker children. In particular, it can contain fo:multi-toggle objects (at any depth), which controls the fo:multi-case switching.

This restriction applies recursively.



For example, an fo:multi-case whose parent fo:multi-switch is a child of another fo:multi-case may only have children that would be permitted in place of the outer fo:multi-case's parent fo:multi-switch.

The following properties apply to this formatting object:

- [Common Accessibility Properties](#) — § 7.5 on page 237
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “starting-state” — § 7.23.10 on page 359
- “case-name” — § 7.23.3 on page 356
- “case-title” — § 7.23.4 on page 356

### 6.9.5. fo:multi-toggle

#### Common Usage:

The fo:multi-toggle is typically used to establish an area that when actuated (for example implemented as "clicked"), has the effect of switching from one fo:multi-case to another. The "switch-to" property value of the fo:multi-toggle typically matches the "case-name" property value of the fo:multi-case to switch to.

#### Areas:

The fo:multi-toggle formatting object does not generate any areas. The fo:multi-toggle formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of the children of the fo:multi-toggle. Each of the areas returned by the fo:multi-toggle has a *switch-to* trait with the same value as on the returning fo:multi-toggle.



*Constraints:*

The order of concatenation of the sequences of areas returned by the children of the `fo:multi-toggle` is the same order as the children are ordered under the `fo:multi-toggle`.

Activating an area returned by an `fo:multi-toggle` causes a change to the value of the *currently-visible-multi-case* of the closest ancestor `fo:multi-switch`. (See § 7.23.11 – “switch-to” on page 359 for how the *switch-to* value selects an `fo:multi-case`.)

*Contents:*

```
(#PCDATA | %inline; | %block; )*
```

An `fo:multi-toggle` is only permitted as a descendant of an `fo:multi-case`.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363
- “switch-to” — § 7.23.11 on page 359

## 6.9.6. `fo:multi-properties`

*Common Usage:*

The `fo:multi-properties` is used to switch between two or more property sets that are associated with a given portion of content.



An `fo:multi-properties` formatting object can be used to give different appearances to a given portion of content. For example, when a link changes from the not-yet-visited state to the visited-state, this could change the set of properties that would be used to format the content. Designers should be careful in choosing which properties they change, because many property changes could cause reflowing of the text which may not be desired in many circumstances. Changing properties such as “color” or “text-decoration” should not require re-flowing the text.

The direct children of an `fo:multi-properties` formatting object is an ordered set of `fo:multi-property-set` formatting objects followed by a single `fo:wrapper` formatting object. The properties, specified on the `fo:wrapper`, that have been specified with a value of “merge-property-values()” will take a value that is a merger of the value on the `fo:multi-properties` and the specified values on the `fo:multi-property-set` formatting objects that apply.

*Areas:*

The `fo:multi-properties` formatting object does not generate any areas. The `fo:multi-properties` formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of the children of the `fo:multi-properties`.

*Constraints:*

The order of concatenation of the sequences of areas returned by the children of the `fo:multi-properties` is the same order as the children are ordered under the `fo:multi-properties`.

*Contents:*

```
(multi-property-set+ , wrapper )
```

The properties that should take a merged value shall be specified with a value of "merge-property-values()". This function, when applied on an fo:wrapper that is a direct child of an fo:multi-properties, merges the applicable property definitions on the fo:multi-property-set siblings.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237

### 6.9.7. fo:multi-property-set

*Common Usage:*

The fo:multi-property-set auxiliary formatting object is used to specify an alternative set of formatting properties that can be used to provide an alternate presentation of the children flow objects of the fo:wrapper child of the parent of this fo:multi-property-set.

*Areas:*

The fo:multi-property-set formatting object does not generate or return any areas. It simply holds a set of traits that may be accessed by expressions.

*Constraints:*

None.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- "id" — § 7.30.8 on page 409
- "index-class" — § 7.24.1 on page 362
- "index-key" — § 7.24.2 on page 363
- "active-state" — § 7.23.1 on page 355

## 6.10. Formatting Objects for Indexing

### 6.10.1. Introduction

The formatting objects and properties for indexing enable the generation of lists of page numbers associated with specific items in the formatting object tree, such as for use in back-of-the-book indexes. There are two kinds of such objects and properties: those that associate index keys with formatting objects throughout the tree and formatting objects that are used in the back-of-the-book index to assemble page references to the pages where the areas from formatting objects with a particular index key occur. Further formatting properties and objects control the way in which these page references are grouped and arranged into ranges.


There are two properties for associating index keys with formatting objects: "index-key" and "index-class". These two properties apply to almost all formatting objects. There are two formatting objects for associating explicit index key ranges, fo:index-range-begin and fo:index-range-end.

Cited page items associated with a particular index key are obtained using the fo:index-key-reference. Its parent, fo:index-page-citation-list, groups and arranges these. In addition, the form of the generated page number list can be defined and controlled using the formatting objects fo:index-page-number-prefix, fo:index-page-number-suffix, fo:index-page-citation-list-separator, and fo:index-page-citation-range-separator. For a back-of-the-book index each index term would have an index key that is used to identify

each occurrence of that term within the document. In the back-of-the-book index there would be at least one fo:index-key-reference for each index key used. For example,

```
<fo:block>Eiffel Tower
  <fo:index-page-citation-list>
    <fo:index-key-reference ref-index-key="Eiffel Tower; ;"/>
  </fo:index-page-citation-list>
</fo:block>
```

The structure and content of the generated list of page numbers can be further controlled through the use of index classes to distinguish different types of index entries or to distinguish entries present in different parts of the document. For example, different classes could be used to distinguish index entries for figures from normal entries or to distinguish entries within one section, e.g. the preface, of a document from entries from another section, e.g. the main body, in order to control the construction of page ranges. The fo:index-page-number-prefix and fo:index-page-number-suffix specify additional text, e.g. "[" and "]", to surround the page numbers in the index.

 The formatting objects for indexing only provide facilities for generating the list of page numbers for individual index keys. Assembling the index entries; identifying all the entries, sorting them, and creating the formatting objects, e.g. fo:block, and text, e.g. "Eiffel Tower", for the entry and referencing the appropriate index key, e.g. "Eiffel Tower; ;", is done by the general stylesheet mechanisms.

### 6.10.1.1. Example

The following example document is used throughout this section to describe the indexing process and how the various options change the presentation of the index.

The source document uses typical XML markup for representing back-of-the-book index entries. The document consists of a preface, four chapters, a glossary, and an index. The formatting style for this document specifies that the preface, body chapters, and glossary all use different page numbers as shown below.

Component	Numbered pages	Ordinal page numbers
Title Page Recto/Verso	n/a	1-2
Table of Contents	iii/iv	3/4
List of Figures	v/vi	5/6
Preface	vii/x	7-10
Chapter 1	1-3/4	11-13/14
Chapter 2	5-12 (pg 4 is blank)	15-22
Chapter 3	13-17/18	23-27/28
Chapter 4	19-24 (pg 18 is blank)	29-34
Glossary	G-1 to G-4	35-38
Index	I-1 to ...	39-...

The composite page numbers (e.g., "G-1") used in the glossary are created using an fo:folio-prefix, e.g.

```
<fo:page-sequence id="glossary" initial-page-number="1">
  <fo:page-number-folio-prefix>
```

```

    <fo:inline>G-</fo:inline>
  </fo:page-number-folio-prefix>
  <fo:flow>...</fo:flow>
</fo:page-sequence>

```

Throughout the document, there are a number of index terms for the Eiffel Tower. This example uses explicit markup in the *source* document's vocabulary. Other mechanisms, such as external index documents, can also be supported as long as the correct formatting objects can be generated. In this example index terms may be primary, secondary, or tertiary, reflecting a typical multi-level index. Primary entries may have subordinate secondary entries. Secondary entries may have subordinate tertiary entries. For this document only the lowest-level entries are associated with page numbers (which means that each "index-term" element can be simply translated into an index key value by concatenating the primary, secondary, and tertiary term values with some separator, ";" in this example, between them).

- Each individual reference to the tower is identified:

```
<indexterm><primary>Eiffel Tower</primary></indexterm>
```

- Some of these terms identify a preferred description of the tower:

```
<indexterm significance="preferred">
  <primary>Eiffel Tower</primary></indexterm>
```

- For a long description of the tower, individual terms mark the beginning and end of the span:

```
<indexterm id="ei.idx" class="startofrange">
  <primary>Eiffel Tower</primary></indexterm>
...
<indexterm startref="ei.idx" class="endofrange"/>
```

- Two of the terms occur inside figures:

```
<figure id="tower1">
  <head>The Eiffel Tower</head>
  <indexterm><primary>Eiffel Tower</primary></indexterm>
  ...
</figure>
```

#### 6.10.1.1.1. Associating Index Keys with Formatting Objects

The first step in generating an index is to transfer the index term information from the source document into the formatting objects. It is the location of this information in the formatting object tree that will determine what pages appear in the index.

Any formatting object to which the "id" property applies can also have an "index-key" property. Any formatting object with an "index-key" specified defines a point or range of text that is associated with the corresponding index key.

To simplify this example, point anchors will be generated for each term (as opposed to placing "index-key" on formatting objects used for other purposes).

Consider the following templates:

```
<xsl:template match="indexterm[@significance='preferred']"
  priority="100">
```

```
<fo:wrapper>
  <xsl:attribute name="index-key">
    <xsl:value-of select="primary"/>
    <xsl:text>;</xsl:text>
    <xsl:value-of select="secondary"/>
    <xsl:text>;</xsl:text>
    <xsl:value-of select="tertiary"/>
    <xsl:text>;preferred</xsl:text>
  </xsl:attribute>
</fo:wrapper>
</xsl:template>

<xsl:template match="indexterm[@class='startofrange']"
  priority="75">
  <fo:index-range-begin id="{@id}"/>
  <xsl:attribute name="index-key">
    <xsl:value-of select="primary"/>
    <xsl:text>;</xsl:text>
    <xsl:value-of select="secondary"/>
    <xsl:text>;</xsl:text>
    <xsl:value-of select="tertiary"/>
  </xsl:attribute>
</xsl:template>

<xsl:template match="indexterm[@class='endofrange']"
  priority="75">
  <fo:index-range-end ref-id="{@startref}"/>
</fo:index-range-end>
</xsl:template>

<xsl:template match="figure/indexterm" priority="50">
  <fo:wrapper>
    <xsl:attribute name="index-key">
      <xsl:value-of select="primary"/>
      <xsl:text>;</xsl:text>
      <xsl:value-of select="secondary"/>
      <xsl:text>;</xsl:text>
      <xsl:value-of select="tertiary"/>
      <xsl:text>;figure</xsl:text>
    </xsl:attribute>
  </fo:wrapper>
</xsl:template>

<xsl:template match="indexterm">
  <fo:wrapper>
```

```

    <xsl:attribute name="index-key">
      <xsl:value-of select="primary"/>
      <xsl:text>;</xsl:text>
      <xsl:value-of select="secondary"/>
      <xsl:text>;</xsl:text>
      <xsl:value-of select="tertiary"/>
    </xsl:attribute>
  </fo:wrapper>
</xsl:template>

```

Applied to the example index terms, these templates will produce a set of index key associations, e.g. (interspersed among the other formatting objects):

```

[E 9] <fo:wrapper index-key="Eiffel Tower;;"/>
[F 10] <fo:wrapper index-key="Eiffel Tower;;"/>
[G 11] <fo:wrapper index-key="Eiffel Tower;;"/>
[H 13] <fo:index-range-begin id="ei.idx" index-key="Eiffel Tower;;"/>
[Y 15] <fo:wrapper index-key="Eiffel Tower;;"/>
[C 15] <fo:wrapper index-key="Eiffel Tower;;;figure"/>
[K 16] <fo:index-range-end ref-id="ei.idx"/>
[L 18] <fo:index-range-begin id="ei2.idx" index-key="Eiffel Tower;;"/>
[A 19] <fo:wrapper index-key="Eiffel Tower;;;preferred"/>
[O 21] <fo:index-range-end ref-id="ei2.idx"/>
[B 23] <fo:wrapper index-key="Eiffel Tower;;;preferred"/>
[D 25] <fo:wrapper index-key="Eiffel Tower;;;figure"/>
[P 27] <fo:wrapper index-key="Eiffel Tower;;"/>
[Q 29] <fo:wrapper index-key="Eiffel Tower;;"/>
[R 30] <fo:wrapper index-key="Eiffel Tower;;"/>
[S 31] <fo:wrapper index-key="Eiffel Tower;;"/>
[T 32] <fo:wrapper index-key="Eiffel Tower;;"/>
[U 33] <fo:wrapper index-key="Eiffel Tower;;"/>
[V 34] <fo:wrapper index-key="Eiffel Tower;;"/>
[X 37] <fo:wrapper index-key="Eiffel Tower;;"/>

```

In the list above a label has been added for each formatting object consisting of a letter and the ordinal page number (see below). These are carried through below to make referencing and reading the example easier.

These formatting objects are spread throughout the document, appearing in the formatting object tree where each index page reference is desired. Naturally, in a real document, there would be many more of these formatting objects, one or more for each term that will appear in the index.

#### 6.10.1.1.2. Building the Index

Assembling a properly collated and sorted index is accomplished using the general stylesheet mechanisms. These details are not considered here.



Index cross references (“see” and “see also” entries) are not associated with page numbers, so they do not use the indexing formatting objects.


This section describes the formatting objects used for collating and sorting the lists of page number citations associated with *each entry* in the index. The formatting objects referenced by index keys are used to generate sets of cited page items referencing sets of pages from the paginated area tree. These cited page items are then collated, sorted, and possibly collapsed into cited page item ranges, and then the final formatting processing is applied. That is, the index processing starts as references to formatting objects by index key, moves to the domain of real pages on which those formatting objects fall, and then, once the lists of pages have been reduced to sets and ranges, results in formatted lists of page numbers and ranges.

The fo:index-page-citation-list formatting object is used to group index key references together. Its ultimate effect is to produce a formatted list of page numbers and ranges. The starting set of cited page items is created using "fo:index-key-reference" formatting objects. Each fo:index-key-reference formatting object uses a single index key to generate cited page items for the pages on which the formatting objects with that key occur. The fo:index-key-reference also provides the formatting properties for these page numbers. All of the cited page items generated from a single fo:index-page-citation-list formatting object are sorted and collated together.

For this example, the formatting style is to distinguish pages that have the principal description of an item by using bold page numbers and to enclose in square brackets the page numbers where the index key occurred in a figure. The following formatting objects accomplish this:

```
<fo:index-page-citation-list
  merge-sequential-page-numbers="merge"/>
<fo:index-key-reference ref-index-key="Eiffel Tower;;;preferred"
  font-weight="bold"
  id="XB"/>
<fo:index-key-reference ref-index-key="Eiffel Tower;;;figure"
  font-style="italic"
  id="XI">
  <fo:index-page-number-prefix>
    <fo:inline>[</fo:inline>
  </fo:index-page-number-prefix>
  <fo:index-page-number-suffix>
    <fo:inline>]</fo:inline>
  </fo:index-page-number-suffix>
</fo:index-key-reference>
<fo:index-key-reference ref-index-key="Eiffel Tower;;;"
  id="XX"/>
</fo:index-page-citation-list>
```

In this index page citation list, three different groups of page citations, represented by references to three different, but related, keys, are merged into a single result list of page citations.

 The "id" values on the fo:index-key-reference formatting objects are for reference purposes in the text below. They are not necessary for index processing.

### 6.10.1.2. Processing the Example Index


This section describes how the index items in the example are processed to produce the final lists of formatted page numbers and page ranges.

For the purpose of the example, assume that the following index classes are used; the preface specifies `index-class="preface"`, all the chapters specify `index-class="chapter"`, and the glossary specifies `index-class="glossary"`.

Each `fo:index-key-reference` references one or more pages or page ranges (that is, the page-viewport-areas in the area tree that has as descendants areas generated by the referenced formatting objects). Each page-viewport-area in the full area tree has an ordinal number which is called the ordinal page number.

In this example the following sets of pages are referenced by the three `fo:index-key-reference` objects:

Key	Ordinal page numbers
Eiffel Tower;;;preferred	19, 23
Eiffel Tower;;;figure	15, 25
Eiffel Tower;;	9, 10, 11, 13-16, 15, 18-21, 27, 29, 30, 31, 32, 33, 34, 37

 Formatting differences, e.g. ordinal page number 9 formats as "ix" and ordinal page number 37 formats as "G-3", will be considered later.

Within each `fo:index-key-reference`, page ranges are expanded to a sequence of individual pages and duplicate pages are removed as described in § 6.10.6 – `fo:index-key-reference` on page 204 resulting in:


Key	Ordinal page numbers
Eiffel Tower;;;preferred	19, 23
Eiffel Tower;;;figure	15, 25
Eiffel Tower;;	9, 10, 11, 13, 14, 15, 16, 18, 19, 20, 21, 27, 29, 30, 31, 32, 33, 34, 37

For the purpose of processing by the `fo:index-page-citation-list` each cited page item can be considered a tuple of four members: the ordinal page number, the formatting object that is referenced by the index-key-reference, the index class of the referenced formatting object, and the `fo:index-key-reference` that referenced the page (here represented by the ID values assigned in the example above).

```
[A] (19, fo:wrapper,          chapter,  XB)
[B] (23, fo:wrapper,          chapter,  XB)
[C] (15, fo:wrapper,          chapter,  XI)
[D] (25, fo:wrapper,          chapter,  XI)
[E] ( 9, fo:wrapper,          preface,  XX)
[F] (10, fo:wrapper,          preface,  XX)
[G] (11, fo:wrapper,          chapter,  XX)
[H] (13, fo:index-range-begin, chapter,  XX)
[I] (14, null,                chapter,  XX)
[J] (15, null,                chapter,  XX)
[K] (16, fo:index-range-end,  chapter,  XX)
[L] (18, fo:index-range-begin, chapter,  XX)
[M] (19, null,                chapter,  XX)
[N] (20, null,                chapter,  XX)
[O] (21, fo:index-range-end,  chapter,  XX)
[P] (27, fo:wrapper,          chapter,  XX)
[Q] (29, fo:wrapper,          chapter,  XX)
```



```
[R] (30, fo:wrapper,          chapter, XX)
[S] (31, fo:wrapper,          chapter, XX)
[T] (32, fo:wrapper,          chapter, XX)
[U] (33, fo:wrapper,          chapter, XX)
[V] (34, fo:wrapper,          chapter, XX)
[X] (37, fo:wrapper,          glossary, XX)
```

 In the case of ranges, the first page in the range is associated with the start of the range and the last page is associated with the end of the range. Intermediate pages don't refer to any particular location on the page, they just refer to that page as a whole.

The next section describes the abstract steps in processing an fo:index-page-citation-list when the merge-pages-across-index-key-references property has the value "leave-separate". § 6.10.1.2.2 – merge-pages-across-index-key-references="merge" on page 201 describes the same steps when merge-pages-across-index-key-references has the value "merge".

### 6.10.1.2.1. merge-pages-across-index-key-references="leave-separate"

Step A in the processing of fo:index-page-citation-list (see § 6.10.7 – fo:index-page-citation-list on page 205) is collating and sorting the cited page items from all the child fo:index-key-reference formatting objects. The merge-pages-across-index-key-references controls whether multiple references to the same page are retained.

The following set of tuples represents the case when merge-pages-across-index-key-references has the value "leave-separate". For example, ordinal page number 19 is represented twice, once for each fo:index-key-reference that referenced it:

```
[E] ( 9, fo:wrapper,          preface, XX)
[F] (10, fo:wrapper,          preface, XX)
[G] (11, fo:wrapper,          chapter, XX)
[H] (13, fo:index-range-begin, chapter, XX)
[I] (14, null,                chapter, XX)
[J] (15, null,                chapter, XX)
[C] (15, fo:wrapper,          chapter, XI)
[K] (16, fo:index-range-end,  chapter, XX)
[L] (18, fo:index-range-begin, chapter, XX)
[A] (19, fo:wrapper,          chapter, XB)
[M] (19, null,                chapter, XX)
[N] (20, null,                chapter, XX)
[O] (21, fo:index-range-end,  chapter, XX)
[B] (23, fo:wrapper,          chapter, XB)
[D] (25, fo:wrapper,          chapter, XI)
[P] (27, fo:wrapper,          chapter, XX)
[Q] (29, fo:wrapper,          chapter, XX)
[R] (30, fo:wrapper,          chapter, XX)
[S] (31, fo:wrapper,          chapter, XX)
[T] (32, fo:wrapper,          chapter, XX)
[U] (33, fo:wrapper,          chapter, XX)
```

```
[V] (34, fo:wrapper,          chapter, XX)
[X] (37, fo:wrapper,          glossary, XX)
```

Step B is performed if *merge-sequential-page-numbers* has the value "merge". It consists of merging cited page items referring to three or more sequential pages (see § 6.10.7 – *fo:index-page-citation-list* on page 205) into a range.

If *merge-ranges-across-index-key-references* has the value "leave-separate", the ranges will be as shown below (ranges are represented by a pair of tuples, the first for the start of the range, the second for the end of the range):

```
[E] ( 9, fo:wrapper,          preface, XX)
[F] (10, fo:wrapper,          preface, XX)
[G] (11, fo:wrapper,          chapter, XX)
([H] (13, fo:index-range-begin, chapter, XX),
 [K] (16, fo:index-range-end,   chapter, XX))
[C] (15, fo:wrapper,          chapter, XI)
([L] (18, fo:index-range-begin, chapter, XX),
 [O] (21, fo:index-range-end,   chapter, XX))
[A] (19, fo:wrapper,          chapter, XB)
[B] (23, fo:wrapper,          chapter, XB)
[D] (25, fo:wrapper,          chapter, XI)
[P] (27, fo:wrapper,          chapter, XX)
([Q] (29, fo:wrapper,          chapter, XX),
 [V] (34, fo:wrapper,          chapter, XX))
[X] (37, fo:wrapper,          glossary, XX)
```

If *merge-ranges-across-index-key-references* has the value "merge", the ranges will be:

```
[E] ( 9, fo:wrapper,          preface, XX)
[F] (10, fo:wrapper,          preface, XX)
[G] (11, fo:wrapper,          chapter, XX)
([H] (13, fo:index-range-begin, chapter, XX),
 [K] (16, fo:index-range-end,   chapter, XX))
([L] (18, fo:index-range-begin, chapter, XX),
 [O] (21, fo:index-range-end,   chapter, XX))
[B] (23, fo:wrapper,          chapter, XB)
[D] (25, fo:wrapper,          chapter, XI)
[P] (27, fo:wrapper,          chapter, XX)
([Q] (29, fo:wrapper,          chapter, XX),
 [V] (34, fo:wrapper,          chapter, XX))
[X] (37, fo:wrapper,          glossary, XX)
```

Step C consists of formatting the cited page items and cited page item ranges as actual page numbers and ranges, taking into account any index page number prefix and suffix and using the appropriate index page citation list separator and index page citation range separator.

**6.10.1.2.2. merge-pages-across-index-key-references="merge"**

The following shows steps A and B when *merge-pages-across-index-key-references* has the value "merge".

In step A tuple [C] is merged with tuple [J] and tuple [M] is merged with tuple [A]:

```
[E] ( 9, fo:wrapper,          preface,  XX)
[F] (10, fo:wrapper,          preface,  XX)
[G] (11, fo:wrapper,          chapter,  XX)
[H] (13, fo:index-range-begin, chapter,  XX)
[I] (14, null,                chapter,  XX)
[C] (15, fo:wrapper,          chapter,  XI)
[K] (16, fo:index-range-end,  chapter,  XX)
[L] (18, fo:index-range-begin, chapter,  XX)
[A] (19, fo:wrapper,          chapter,  XB)
[N] (20, null,                chapter,  XX)
[O] (21, fo:index-range-end,  chapter,  XX)
[B] (23, fo:wrapper,          chapter,  XB)
[D] (25, fo:wrapper,          chapter,  XI)
[P] (27, fo:wrapper,          chapter,  XX)
[Q] (29, fo:wrapper,          chapter,  XX)
[R] (30, fo:wrapper,          chapter,  XX)
[S] (31, fo:wrapper,          chapter,  XX)
[T] (32, fo:wrapper,          chapter,  XX)
[U] (33, fo:wrapper,          chapter,  XX)
[V] (34, fo:wrapper,          chapter,  XX)
[X] (37, fo:wrapper,          glossary, XX)
```

In step B, if *merge-ranges-across-index-key-references* has the value "leave-separate", the ranges will be:

```
[E] ( 9, fo:wrapper,          preface,  XX)
[F] (10, fo:wrapper,          preface,  XX)
[G] (11, fo:wrapper,          chapter,  XX)
[H] (13, fo:index-range-begin, chapter,  XX)
[I] (14, null,                chapter,  XX)
[C] (15, fo:wrapper,          chapter,  XI)
[K] (16, fo:index-range-end,  chapter,  XX)
[L] (18, fo:index-range-begin, chapter,  XX)
[A] (19, fo:wrapper,          chapter,  XB)
[N] (20, null,                chapter,  XX)
[O] (21, fo:index-range-end,  chapter,  XX)
[B] (23, fo:wrapper,          chapter,  XB)
[D] (25, fo:wrapper,          chapter,  XI)
[P] (27, fo:wrapper,          chapter,  XX)
([Q] (29, fo:wrapper,          chapter,  XX),
 [V] (34, fo:wrapper,          chapter,  XX))
[X] (37, fo:wrapper,          glossary, XX)
```

If *merge-ranges-across-index-key-references* has the value "merge", the ranges will be:

```
[E] ( 9, fo:wrapper,          preface, XX)
[F] (10, fo:wrapper,          preface, XX)
[G] (11, fo:wrapper,          chapter, XX)
([H] (13, fo:index-range-begin, chapter, XX),
 [K] (16, fo:index-range-end,  chapter, XX))
([L] (18, fo:index-range-begin, chapter, XX),
 [O] (21, fo:index-range-end,  chapter, XX))
[B] (23, fo:wrapper,          chapter, XB)
[D] (25, fo:wrapper,          chapter, XI)
[P] (27, fo:wrapper,          chapter, XX)
([Q] (29, fo:wrapper,          chapter, XX),
 [V] (34, fo:wrapper,          chapter, XX))
[X] (37, fo:wrapper,          glossary, XX)
```

### 6.10.1.3. Example Index

The final set of page numbers that will appear in the example index entry depends on the values of the *merge-pages-across-index-key-references*, *merge-ranges-across-index-key-references*, and *index-class* traits. If the index terms from the preface, chapter and glossary have different *index-class* values as is the case in the example, then the results for the generated page number list are:

<b>merge-pages-across-index-key-references/ merge-ranges-across-index-key-references</b>	<b>Resulting index pages</b>
leave-separate/leave-separate	ix, x, 1, 3-6, [5], 8-11, <b>9</b> , <b>13</b> , [15], 17, 19-24, G-3
leave-separate/merge	ix, x, 1, 3-6, 8-11, <b>13</b> , [15], 17, 19-24, G-3
merge/leave-separate	ix, x, 1, 3, 4, [5], 6, 8, <b>9</b> , 10, 11, <b>13</b> , [15], 17, 19-24, G-3
merge/merge	ix, x, 1, 3-6, 8-11, <b>13</b> , [15], 17, 19-24, G-3

If the index terms from the preface, chapter, and appendix pages *are* in the same *index-class*:

<b>merge-pages-across-index-key-references/ merge-ranges-across-index-key-references</b>	<b>Resulting index pages</b>
leave-separate/leave-separate	ix-1, 3-6, [5], 8-11, <b>9</b> , <b>13</b> , [15], 17, 19-24, G-3
leave-separate/merge	ix-1, 3-6, 8-11, <b>13</b> , [15], 17, 19-24, G-3
merge/leave-separate	ix-1, 3, 4, [5], 6, 8, <b>9</b> , 10, 11, <b>13</b> , [15], 17, 19-24, G-3
merge/merge	ix-1, 3-6, 8-11, <b>13</b> , [15], 17, 19-24, G-3

### 6.10.2. fo:index-page-number-prefix

*Common Usage:*

The *fo:index-page-number-prefix* formatting object specifies a static prefix for the cited page items created by *fo:index-key-reference*.

*Areas:*

The fo:index-page-number-prefix formatting object does not directly produce any areas. Its children will be retrieved and used by fo:index-page-citation-list when formatting cited page items and cited page item ranges.

*Constraints:*

None.

*Contents:*

```
(#PCDATA|%inline;)*
```

### 6.10.3. fo:index-page-number-suffix

*Common Usage:*

The fo:index-page-number-suffix formatting object specifies a static suffix for the cited page items created by fo:index-key-reference.

*Areas:*

The fo:index-page-number-suffix formatting object does not directly produce any areas. Its children will be retrieved and used by fo:index-page-citation-list when formatting cited page items and cited page item ranges.

*Constraints:*

None.

*Contents:*

```
(#PCDATA|%inline;)*
```

### 6.10.4. fo:index-range-begin

*Common Usage:*

The fo:index-range-begin formatting object is used to indicate the beginning of an "indexed range" associated with an index key. The index range is ended by a corresponding fo:index-range-end.

All formatting objects following (in document order) this fo:index-range-begin, and up to the matching fo:index-range-end, are considered to be under the index range influence of this fo:index-range-begin.

*Areas:*

The fo:index-range-begin does not generate any area.

*Constraints:*

Each fo:index-range-begin formatting object must specify both an id and an index-key property.

An fo:index-range-begin/fo:index-range-end pair is considered a matching pair if the ref-id property of the fo:index-range-end has the same value as the id property on the fo:index-range-begin.

Following this fo:index-range-begin in document order, there must be an fo:index-range-end with which it forms a matching pair. If there is no such fo:index-range-end, it is an error, and the implementation should recover by assuming the equivalent of a matching fo:index-range-end at the end of the document.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- “**id**” — § 7.30.8 on page 409
- “**index-key**” — § 7.24.2 on page 363
- “**index-class**” — § 7.24.1 on page 362

**6.10.5. fo:index-range-end***Common Usage:*

The fo:index-range-end is used to indicate the end of an "indexed range" that is started by its matching fo:index-range-begin. See § 6.10.4 – fo:index-range-begin on page 203 for details.

*Areas:*

The fo:index-range-end does not generate any area.

*Constraints:*

Preceding this fo:index-range-end in document order, there must be an fo:index-range-begin with which it forms a matching pair. If there is no such fo:index-range-begin, it is an error, and the implementation should recover by ignoring this fo:index-range-end.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- “**ref-id**” — § 7.30.13 on page 412

**6.10.6. fo:index-key-reference***Common Usage:*

The fo:index-key-reference formatting object is used to generate a set of cited page items for all the occurrences of the specified index-key.

A *cited page item* is a name for a collection containing the following information:

- a reference to a page area
- a reference to an fo:index-key-reference
- an index class.

*Areas:*


The fo:index-key-reference does not generate any areas. The containing fo:index-page-citation-list formatting object uses the cited page items that it contains to produce the generated list of page numbers.

*Constraints:*


Each fo:index-key-reference formatting object identifies one or more formatting objects in the formatting object tree with an index-key value that matches the ref-index-key property of the fo:index-key-reference. It is an error if there are no such formatting objects. Implementations should recover from this error by ignoring the fo:index-key-reference.

If the matched index-key occurs on an `fo:index-range-begin`, all of the pages whose descendants include areas generated by formatting objects under the index range influence of that `fo:index-range-begin` are referenced by the generated cited page items.

For each formatting object containing a matching index-key, a cited page item is generated for each page whose descendants include areas returned from that formatting object. The index class of these cited page items is taken from that formatting object. If there are no areas returned from that formatting object then a cited page item is generated referring to the page containing the first area returned from a following formatting object, if any, or the last area returned from a preceding formatting object, if any.

 For example, if the matched index-key occurs on an `fo:block` and that block spans pages 3 and 4, then pages 3 and 4 are referenced. If the block is wholly contained on page 3, only page 3 is referenced. Equally, if the matched element is an `fo:index-range-begin` on page 8 and the matching pair `fo:index-range-end` is on page 10, then pages 8-10 are referenced. If the beginning of the range and the end of the range both occur on page 8, then only page 8 is referenced.

Within each `fo:index-key-reference`, page ranges are expanded to a sequence of individual cited page items and all but one cited page item that refer to the same page are removed. When two cited page items refer to the same page, the cited page item referring to the `fo:index-range-begin` or `fo:index-range-end` occurring first in document order is retained. If none of the referenced formatting objects is an `fo:index-range-begin` or `fo:index-range-end`, the cited page item referring to the formatting object that occurs first in the page is retained.

 Duplicates are removed irrespective of index-class.

*Contents:*

([index-page-number-prefix?](#), [index-page-number-suffix?](#))

*The following properties apply to this formatting object:*

- “[page-number-treatment](#)” — § 7.24.3 on page 363
- “[ref-index-key](#)” — § 7.24.7 on page 365

### 6.10.7. `fo:index-page-citation-list`

*Common Usage:*

The `fo:index-page-citation-list` formatting object is used to group together the sets of cited page items generated by its `fo:index-key-reference` children. Each `fo:index-key-reference` child provides formatting properties for the corresponding cited page items. The resulting cited page items are sorted and collated together. The ultimate effect of the `fo:index-page-citation-list` is to generate a formatted list of page numbers and ranges.

*Areas:*

The `fo:index-page-citation-list` formatting object generates and returns one or more *normal inline-areas*.

*Trait Derivation:*

The traits used for formatting the individual parts of the list of page numbers and ranges is described below.

*Constraints:*

Although the constraints are described as performing a series of steps, this is solely for the convenience of exposition and does not imply they must be implemented as separate steps in any conforming implementation. A conforming implementation must only achieve the same effect.

Step A: Cited page items from all the child `fo:index-key-reference` formatting objects are sorted in area tree order. There are then two cases: if `merge-pages-across-index-key-references` has the value "leave-separate", cited page items referring to the same page generated by different `fo:index-key-reference` formatting objects will be preserved. If `merge-pages-across-index-key-references` has the value "merge", only one of the cited page items referring to any given page will be preserved, as specified in § 7.24.6 – “merge-pages-across-index-key-references” on page 364.

Step B: consists of merging sequences of three or more sequential cited page items into a cited page item range. It is performed only if the value of `merge-sequential-page-numbers` is "merge".

Several conditions influence whether or not any two cited page items from the complete set of cited page items are considered sequential. Two cited page items are sequential if and only if all of the following conditions hold:

1. The cited page items refer to page-viewport-areas that are consecutive children of the root of the area tree.
2. They have the same *index-class*.
3. Either the cited page items are generated by the same `fo:index-key-reference` or the value of `merge-ranges-across-index-key-references` is "merge".

Step C: consists of formatting the cited page items and cited page item ranges into the list of formatted page numbers and ranges. The result is the same as formatting a sequence of result tree fragments corresponding to individual page numbers, any index page number prefix or suffix, range and list separators.

For each cited page item, from `fo:index-key-reference` *R*, the result areas are the same as the result of formatting:

1. If *R* has an `fo:index-page-number-prefix` child, an `fo:inline` containing the result-tree fragment that are the children of the `fo:index-page-number-prefix`. The traits of the `fo:inline` are inherited from *R*, except for `keep-with-next.within-line` which has the value "always".
2. An `fo:inline` containing the result-tree fragment, defined in § 6.6.10 – `fo:page-number` on page 142, using the page referenced by the cited page item as the *reference-page*, and the `fo:page-sequence` that generated the referenced page as the *reference-page-sequence*. The traits of the `fo:inline` are inherited from *R*. If the `page-number-treatment` has the value "link", the `fo:inline` should be a link back to the source of the reference as for `fo:basic-link`.
3. If *R* has an `fo:index-page-number-suffix` child, an `fo:inline` containing the result-tree fragment that are the children of the `fo:index-page-number-suffix`. The traits of the `fo:inline` are inherited from *R*, except for `keep-with-previous.within-line` which has the value "always".

For each cited page item range the result areas are the same as the result of formatting:

1. The first cited page item in the range in the same way as a cited page item; see above.
2. If the `fo:index-page-citation-list` has an `fo:index-page-citation-range-separator` child, an `fo:inline` containing the result-tree fragment that are the children of the `fo:index-page-citation-range-separator`.



The traits of the `fo:inline` are inherited from the `fo:index-page-citation-range-separator`, except for `keep-with-previous.within-line` and `keep-with-next.within-line` that have the value "always".

Otherwise an `fo:character` with traits: `character` with value U+2013 (en dash), `keep-with-previous.within-line` and `keep-with-next.within-line` that have the value "always". All other traits are inherited from the `fo:index-page-citation-list`. Implementations may provide an alternative default, for example to provide a language- or locale-specific index range separator.

3. The last cited page item in the range in the same way as a cited page item; see above.

After each formatted page item or range, except the last, a separator is inserted. The result areas are the same as the result of formatting:

If the `fo:index-page-citation-list` has an `fo:index-page-citation-list-separator` child, the result-tree fragment that are the children of the `fo:index-page-citation-list-separator`. The traits of the `fo:inline` are inherited from the `fo:index-page-citation-list-separator`.

Otherwise an `fo:character` with traits: `character` with value U+002C (comma) and `keep-with-previous.within-line` with value "always", followed by an `fo:character` with trait: `character` with value U+0020 (space). All other traits are inherited from the `fo:index-page-citation-list`. Implementations may provide an alternative default, for example to provide a language- or locale-specific index list separator.

*Contents:*

`(index-page-citation-list-separator?, index-page-citation-range-separator?, index-key-reference+)`

*The following properties apply to this formatting object:*

- “[merge-sequential-page-numbers](#)” — § 7.24.5 on page 364
- “[merge-ranges-across-index-key-references](#)” — § 7.24.4 on page 363
- “[merge-pages-across-index-key-references](#)” — § 7.24.6 on page 364

### 6.10.8. `fo:index-page-citation-list-separator`

*Common Usage:*

The `fo:index-page-citation-list-separator` formatting object specifies the formatting objects used to separate singleton page numbers or page number ranges in the generated list of page numbers.

*Areas:*

The `fo:index-page-citation-list-separator` formatting object does not directly produce any areas. Its children will be retrieved and used by `fo:index-page-citation-list` when formatting the list of page references.

*Constraints:*

None.

*Contents:*

`(#PCDATA| %inline;)*`

### 6.10.9. `fo:index-page-citation-range-separator`

*Common Usage:*

The `fo:index-page-citation-range-separator` formatting object specifies the formatting objects used to separate two page numbers forming a range in the generated list of page numbers.

*Areas:*

The fo:index-page-citation-range-separator formatting object does not directly produce any areas. Its children will be retrieved and used by fo:index-page-citation-list when formatting the list of page references.

*Constraints:*

None.

*Contents:*

```
(#PCDATA|%inline;)*
```

## 6.11. Formatting Objects for Bookmarks

### 6.11.1. fo:bookmark-tree

*Common Usage:*

The fo:bookmark-tree formatting object is used to hold a list of access points within the document such as a table of contents, a list of figures or tables, etc. Each access point is called a bookmark.

*Areas:*

This formatting object returns the sequence of areas returned by the children of this formatting object.

*Constraints:*

The sequence of returned areas must be the concatenation of the sub-sequences of areas returned by each of the flow children of the fo:bookmark-tree formatting object in the order in which the children occur.

*Contents:*

```
(bookmark+)
```

### 6.11.2. fo:bookmark

*Common Usage:*

The fo:bookmark formatting object is used to identify an access point, by name, and to specify where that access point is within the current document or another external document. A given bookmark may be further subdivided into a sequence of (sub-)bookmarks to as many levels as the authors desire.



The fo:bookmark is a specialized form of the fo:basic-link with restrictions on the applicable properties and on its content model.

*Areas:*

The fo:bookmark formatting object generates one or more normal inline-areas. The fo:bookmark returns these areas.

*Constraints:*

One of the external-destination and internal-destination properties should be specified. If both are specified, the system may either report it as an error, or use the internal-destination property.

No area may have more than one normal child area returned by the same fo:bookmark formatting object.

The children of each normal area returned by an fo:bookmark must satisfy the constraints specified in § 4.7.3 – [Inline-building](#) on page 39.

The property "starting-state" determines whether any sub-list of bookmarks is initially displayed or is hidden. The value "show" means include the sub-list of bookmarks in the presentation of this bookmark. The value "hide" means show only this bookmark in the presentation.

*Contents:*

(`bookmark-title`, `bookmark*`)

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- “external-destination” — § 7.23.6 on page 357
- “internal-destination” — § 7.23.8 on page 358
- “starting-state” — § 7.23.10 on page 359

### 6.11.3. fo:bookmark-title

*Common Usage:*

The fo:bookmark-title formatting object is used to identify, in human readable form, an access point.



The fo:bookmark-title is a specialized form of the fo:inline with restrictions on the applicable properties and on its content model.

*Areas:*

The fo:bookmark-title formatting object generates one or more normal inline-areas. The fo:bookmark-title returns these areas.

*Trait Derivation:*

Even though the white-space-treatment, linefeed-treatment, and white-space-collapse properties are not applicable to fo:bookmark-title, the implementation should behave as though these properties applied and had their initial values.

*Constraints:*

No area may have more than one normal child area returned by the same fo:bookmark-title formatting object.

The children of each normal area returned by an fo:bookmark-title must satisfy the constraints specified in § 4.7.3 – [Inline-building](#) on page 39.

*Contents:*

(#PCDATA)

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- “color” — § 7.18.1 on page 335
- “font-style” — § 7.9.7 on page 277  
with the value space limited to "normal" and "italic",
- “font-weight” — § 7.9.9 on page 278  
with the value space limited to "normal" and "bold"

## 6.12. Out-of-Line Formatting Objects

### 6.12.1. Introduction

#### 6.12.1.1. Floats

The fo:float formatting object is used for two distinct purposes. First, so that during the normal placement of content, some related content is formatted into a separate area at the beginning of a page where it is available to be read without immediately intruding on the reader. The areas generated by this kind of fo:float are called before-floats. An fo:float is specified to generate before-floats if it has a "float" property value of "before". The constraints on placing before-floats on a page are described in the § 6.12.1.3 – [Conditional Sub-Regions](#) on page 210 section of this introduction and in the description of the fo:float formatting object.

Second, the fo:float formatting object is used when an area is intended to float to one side, with normal content flowing alongside the floated area. The areas generated by this kind of fo:float are called side-floats. A side-float is always made a child of the nearest ancestor reference-area. The edge of the reference-area towards which the side-float floats is controlled by the value of the "float" property.

Flowing normal content flowing alongside side-floats is realized by increasing the start-intrusion-adjustment or the end-intrusion-adjustment of normal child areas of the parent reference-area of the side-float.

The "clear" property applies to any block-level formatting object. If the value of this property for a particular formatting object is any value other than "none", then the areas generated by the block will be positioned to ensure that their border-rectangles do not overlap the allocation-rectangles of the applicable side-floats as determined by the "clear" property value.

#### 6.12.1.2. Footnotes

The fo:footnote formatting object is used to generate both a footnote and its citation. The fo:footnote has two children, which are both required to be present. The first child is an fo:inline formatting object, which is formatted to produce the footnote citation. The second child is an fo:footnote-body formatting object which generates the content (or body) of the footnote.

The actual areas generated by the descendants of the fo:footnote-body formatting object are determined by the formatting objects that comprise the descendant subtree. For example, the footnote could be formatted with a label and an indented body by using the fo:list-block formatting object within the fo:footnote-body.

#### 6.12.1.3. Conditional Sub-Regions

The region-body has two conditional sub-regions which implicitly specify corresponding reference-areas called *before-float-reference-area* and *footnote-reference-area*. These reference-areas are conditionally generated as children of the region-reference-area. The before-float-reference-area is generated only if the page contains one or more areas with area-class "xsl-before-float". The footnote-reference-area is generated only if the page contains one or more areas with area-class "xsl-footnote".

The conditionally generated areas borrow space in the *block-progression-dimension* (this is "height" when the writing-mode is "lr-tb") within the region-reference-area, at the expense of the main-reference-area. Whether or not a conditionally generated area is actually generated depends, additionally, on whether there is sufficient space left in the main-reference-area.

There may be limits on how much space conditionally generated areas can borrow from the region-reference-area. It is left to the user agent to decide these limits.

The block-progression-dimension of the main-reference-area is set equal to the block-progression-dimension of the allocation-rectangle of the region-reference-area minus the sum of the sizes in the block-progression-direction of the allocation-rectangles of the conditionally generated reference-areas that were actually generated. The main-reference-area is positioned to immediately follow the after-edge of the allocation-rectangle of the before-float-reference-area. This positions the after-edge of the main-reference-area to coincide with the before-edge of the allocation-rectangle of the footnote-reference-area. In addition to the constraints normally determined by the region-reference-area, the *inline-progression-dimension* (this is "width" when the writing-mode is "lr-tb") of a conditionally generated reference-area is constrained to match the inline-progression-dimension of the main-reference-area.

Each conditionally generated reference-area may additionally contain a sequence of areas used to separate the reference-area from the main-reference-area. The sequence of areas is the sequence returned by formatting an fo:static-content specified in the page-sequence that is being used to format the page.

If there is an fo:static-content in a page-sequence whose "flow-name" property value is "xsl-before-float-separator", then the areas returned by formatting the fo:static-content are inserted in the proper order as the last children of a before-float-reference-area that is generated using the same page-master, provided the main-reference-area on the page is not empty.

If there is an fo:static-content whose "flow-name" property value is "xsl-footnote-separator", then the areas returned by formatting the fo:static-content are inserted in the proper order as the initial children of a footnote-reference-area that is generated using the same page-master.

An interactive user agent may choose to create "hot links" to the footnotes from the footnote-citation, or create "hot links" to the before-floats from an implicit citation, instead of realizing conditional sub-regions.

The generation of areas with area-class "xsl-before-float" or "xsl-footnote" is specified in the descriptions of the formatting objects that initially return areas with those area-classes.

#### 6.12.1.4. Examples

##### 6.12.1.4.1. Floating Figure

Input sample:

```
<doc>
  <p>C'ien pieces were made in northern towns, such as C'ien Mai.
  They were typically of tamlung weight.</p>
  <figure>
    <photo image="TH0317A.jpg"/>
    <caption>C'ien Tamlung of C'ien Mai</caption>
  </figure>
</doc>
```

In this example the figures are placed as floats at the before side (top in a lr-tb writing-mode).

XSL Stylesheet:

```
<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:fo="http://www.w3.org/1999/XSL/Format"
  version='1.0'>
```

```

<xsl:template match="p">
  <fo:block>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="figure">
  <fo:float float="before">
    <xsl:apply-templates/>
  </fo:float>
</xsl:template>

<xsl:template match="photo">
  <fo:block text-align="center">
    <fo:external-graphic src="{@image}"/>
  </fo:block>
</xsl:template>

<xsl:template match="caption">
  <fo:block space-before="3pt" text-align="center"
    start-indent="10mm" end-indent="10mm">
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

</xsl:stylesheet>

```

### Result Instance: elements and attributes in the fo: namespace

```

<fo:block>C'ien pieces were made in northern towns,
such as C'ien Mai. They were typically of tamlung weight.
</fo:block>

<fo:float float="before">

  <fo:block text-align="center">
    <fo:external-graphic src="TH0317A.jpg">
    </fo:external-graphic>
  </fo:block>

  <fo:block space-before="3pt" text-align="center" start-indent="10mm"
    end-indent="10mm">C'ien Tamlung of C'ien Mai
  </fo:block>

</fo:float>

```

### 6.12.1.4.2. Footnote

Input sample:

```
<doc>
  <p>Some Pod Duang were restruck<fn>Berglund, A., Thai Money, from
Earliest Times to King Rama V, p. 203.</fn> during the reign of King Rama V.</p>
</doc>
```

In this example the footnotes are numbered consecutively throughout the document. The footnote callout is the number of the footnote, followed by a ")", as a superscript. The footnote itself is formatted using list formatting objects with the footnote number as the label and the footnote text as the body.

XSL Stylesheet:

```
<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                xmlns:fo="http://www.w3.org/1999/XSL/Format"
                version='1.0'>

<xsl:template match="p">
  <fo:block>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="fn">
  <fo:footnote>
    <fo:inline font-size="0.83em" baseline-shift="super">
      <xsl:number level="any" count="fn" format="1")"/>
    </fo:inline>
    <fo:footnote-body>
      <fo:list-block provisional-distance-between-starts="20pt"
        provisional-label-separation="5pt">
        <fo:list-item>
          <fo:list-item-label end-indent="label-end(">
            <fo:block font-size="0.83em"
              line-height="0.9em">
              <xsl:number level="any" count="fn" format="1")"/>
            </fo:block>
          </fo:list-item-label>
          <fo:list-item-body start-indent="body-start(">
            <fo:block font-size="0.83em"
              line-height="0.9em">
              <xsl:apply-templates/>
            </fo:block>
          </fo:list-item-body>
        </fo:list-item>
      </fo:list-block>
    </fo:footnote-body>
  </fo:footnote>
</xsl:template>
```

```

    </fo:list-block>
  </fo:footnote-body>
</fo:footnote>
</xsl:template>

</xsl:stylesheet>

```

### Result Instance: elements and attributes in the fo: namespace

```

<fo:block>Some Pod Duang were restructk
  <fo:footnote>
    <fo:inline font-size="0.83em" baseline-shift="super">1)
  </fo:inline>
  <fo:footnote-body>
    <fo:list-block provisional-distance-between-starts="20pt"
      provisional-label-separation="5pt">
      <fo:list-item>
        <fo:list-item-label end-indent="label-end()">
          <fo:block font-size="0.83em" line-height="0.9em">1)
        </fo:block>
        </fo:list-item-label>
        <fo:list-item-body start-indent="body-start()">
          <fo:block font-size="0.83em" line-height="0.9em">Berglund, A.,
Thai Money, from Earliest Times to King Rama V, p. 203.
        </fo:block>
        </fo:list-item-body>
      </fo:list-item>
    </fo:list-block>
  </fo:footnote-body>
</fo:footnote> during the reign of King Rama V.
</fo:block>

```

#### 6.12.2. fo:float

##### *Common Usage:*

The fo:float formatting object is typically used either to cause an image to be positioned in a separate area at the beginning of a page, or to cause an image to be positioned to one side, with normal content flowing around and along-side the image.

##### *Areas:*

The fo:float generates an optional single area with area-class "xsl-anchor", and one or more block-areas that all share the same area-class, which is either "xsl-before-float", "xsl-side-float" or "xsl-normal" as specified by the "float" property. (An fo:float generates normal block-areas if its "float" property value is "none".)

Areas with area-class "xsl-side-float" are reference areas.

An area with area-class "xsl-before-float" is placed as a child of a before-float-reference-area.



The optional area with area-class "xsl-anchor" is not generated if the "float" property value is "none", or if, due to an error as described in the constraints section, the fo:float shall be formatted as though its "float" property was "none". Otherwise, the area with area-class "xsl-anchor" shall be generated.

The area with area-class "xsl-anchor" has no children, and is an inline-area, except where this would violate the constraints that (a.) any area's children must be either block-areas or inline-areas, but not a mixture, and (b.) the children of a line-area may not consist only of anchor areas. In the case where an inline-area would violate these constraints, the fo:float must instead generate a block-area.

*Constraints:*

The normal inline-area generated by the fo:float shall be placed in the area tree as though the fo:float had a "keep-with-previous" property with value "always". The inline-area has a length of zero for both the inline-progression-dimension and block-progression-dimension.

The term *anchor-area* is used here to mean the area with area-class "xsl-anchor" generated by the fo:float. An area with area-class "xsl-side-float" is a *side-float*.

No area may have more than one child block-area with the same area-class returned by the same fo:float formatting object.

Areas with area-class "xsl-before-float" must be properly ordered within the area tree relative to other areas with the same area-class.

The padding-, border-, and content-rectangles of the block-areas generated by fo:float all coincide. That is, the padding and border are zero at all edges of the area.

The following constraints apply to fo:float formatting objects that generate areas with area-class "xsl-before-float":

- It is an error if the fo:float occurs as a descendant of a flow that is not assigned to one or more region-body regions, or of an fo:block-container that generates absolutely positioned areas. In either case, the fo:float shall be formatted as though its "float" property was "none".
- A block-area with area-class "xsl-before-float" generated by the fo:float may only be descendant from a before-float-reference-area that is (a) descendant from a "region-reference-area" generated using the region-master for the region to which the flow that has the fo:float as a descendant is assigned, and (b) is descendant from the same page containing the anchor-area, or from a page following that page.
- The fo:float may not generate any additional block-areas with area-class "xsl-before-float" unless the page containing the preceding block-area generated by the fo:float contains no other areas with area-class "xsl-before-float", has an empty main-reference-area, and does not contain a footnote-reference-area.
- The "clear" property does not apply.

The following constraints apply to fo:float formatting objects that generate areas with area-class "xsl-side-float":

- Each side-float is placed either as a child of the nearest ancestor reference-area of the anchor-area or as a child of a later reference-area in the same reference-area chain.
- Side-floats that are siblings in the area-tree may overlap their content rectangles.
- The description in section 9.5 of [CSS2] shall be used to determine the formatting of the fo:float and the rendering of normal line-areas and side-floats that are inline-overlapping, with these modifications:

- All references to left and right shall be interpreted as their corresponding writing-mode relative directions "start" and "end". The "float" property will additionally have the writing-mode relative values "start" and "end".
- All references to top and bottom shall be interpreted as their corresponding writing-mode relative directions "before" and "after".
- The phrase "current line box" shall be interpreted to mean the line-area containing the anchor-area generated by the float. If the anchor-area is a block-area then the "current line box" does not exist.
- Side-floats derive their length in the inline-progression-dimension intrinsically from their child areas; the length is not determined by an explicit property value.
- A side-float may add to the intrusion adjustment of any inline-overlapping block-area whose nearest ancestor reference-area is the parent of the side-float. See § 4.4.2 – [Intrusion Adjustments](#) on page 33 for the description of intrusion adjustments.
- The user agent may make its own determination, after taking into account the intrusion adjustments caused by one or more overlapping side-floats, that the remaining space in the inline-progression-direction is insufficient for the next side-float or normal block-area. The user agent may address this by causing the next side-float or normal block-area to "clear" one of the relevant side-floats, as described in the "clear" property description, so the intrusion adjustment is sufficiently reduced. Of the side-floats that could be cleared to meet this constraint, the side-float that is actually cleared must be the one whose after-edge is closest to the before-edge of the parent reference-area.



The user agent may determine sufficiency of space by using a fixed length, or by some heuristic such as whether an entire word fits into the available space, or by some combination, in order to handle text and images.

#### Contents:

(%block;)+

An fo:float is not permitted to have an fo:float, fo:footnote or fo:marker as a descendant.

Additionally, an fo:float is not permitted to have as a descendant an fo:block-container that generates an absolutely positioned area.

*The following properties apply to this formatting object:*

- “float” — § 7.19.2 on page 340
- “clear” — § 7.19.1 on page 337
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363

### 6.12.3. fo:footnote

#### Common Usage:

The fo:footnote is typically used to produce footnote-citations within the region-body of a page and the corresponding footnote in a separate area nearer the after-edge of the page.

*Areas:*

The fo:footnote formatting object does not generate any areas. The fo:footnote formatting object returns the areas generated and returned by its child fo:inline formatting object.

Additionally the fo:footnote formatting object returns the block-areas with area class "xsl-footnote" generated by its fo:footnote-body child. An area with area-class "xsl-footnote" is placed as a child of a footnote-reference-area.

*Constraints:*

The term *anchor-area* is defined to mean the last area that is generated and returned by the fo:inline child of the fo:footnote.

A block-area returned by the fo:footnote is only permitted as a descendant from a footnote-reference-area that is (a) descendant from a "region-reference-area" generated using the region-master for the region to which the flow that has the fo:footnote as a descendant is assigned, and (b) is descendant from the same page that contains the anchor-area, or from a page following the page that contains the anchor-area.

The second block-area and any additional block-areas returned by an fo:footnote must be placed on the immediately subsequent pages to the page containing the first block-area returned by the fo:footnote, before any other content is placed. If a subsequent page does not contain a region-body, the user agent must use the region-master of the last page that did contain a region-body to hold the additional block-areas.

It is an error if the fo:footnote occurs as a descendant of a flow that is not assigned to one or more region-body regions, or of an fo:block-container that generates absolutely positioned areas. In either case, the block-areas generated by the fo:footnote-body child of the fo:footnote shall be returned to the parent of the fo:footnote and placed in the area tree as though they were normal block-level areas.

*Contents:*

([inline](#), [footnote-body](#))

An fo:footnote is not permitted to have an fo:float, fo:footnote, or fo:marker as a descendant.

Additionally, an fo:footnote is not permitted to have as a descendant an fo:block-container that generates an absolutely positioned area.

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363

#### **6.12.4. fo:footnote-body**

*Common Usage:*

The fo:footnote-body is used to generate the footnote content.

*Areas:*

The fo:footnote-body generates and returns one or more block-level areas with area-class "xsl-footnote".

*Constraints:*

The fo:footnote-body is only permitted as a child of an fo:footnote.

No area may have more than one child block-area returned by the same fo:footnote-body formatting object.

Areas with area-class "xsl-footnote" must be properly ordered within the area tree relative to other areas with the same area-class.

*Contents:*

(%block;)+

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [“id”](#) — § 7.30.8 on page 409
- [“index-class”](#) — § 7.24.1 on page 362
- [“index-key”](#) — § 7.24.2 on page 363

## 6.13. Other Formatting Objects

### 6.13.1. Introduction

#### 6.13.1.1. Examples

##### 6.13.1.1.1. Wrapper

The following example shows the use of the fo:wrapper formatting object that has no semantics but acts as a "carrier" for inherited properties.

Input sample:

```
<doc>
<p>This is an <emph>important word</emph> in this
sentence that also refers to a <code>variable</code>.</p>
</doc>
```

The "emph" elements are to be presented using a bold font and the "code" elements using a Courier font.

XSL Stylesheet:

```
<?xml version='1.0'?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                xmlns:fo="http://www.w3.org/1999/XSL/Format"
                version='1.0'>

<xsl:template match="p">
  <fo:block>
    <xsl:apply-templates/>
  </fo:block>
</xsl:template>

<xsl:template match="emph">
  <fo:wrapper font-weight="bold">
    <xsl:apply-templates/>
  </fo:wrapper>
```

```
</xsl:template>

<xsl:template match="code">
  <fo:wrapper font-family="Courier">
    <xsl:apply-templates/>
  </fo:wrapper>
</xsl:template>
```

```
</xsl:stylesheet>
```

fo: element and attribute tree:

```
<fo:block xmlns:fo="http://www.w3.org/1999/XSL/Format">This is an
<fo:wrapper font-weight="bold">important word</fo:wrapper>
in this sentence that also refers to a
<fo:wrapper font-family="Courier">variable</fo:wrapper>.
</fo:block>
```

#### 6.13.1.1.2. Table Markers

The following example shows how to use the fo:retrieve-table-marker formatting object to create a 'Table continued...' caption that appears at the bottom of the table, when the table continues on the next page (assuming enough data is present that page breaks are generated). It will also show the subtotal at the bottom of the page when the table continues on the next page, and the grand total at the end of the table.

Input sample:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<numbers>
  <number>1</number>
  <number>2</number>
  <!-- and so on... -->
  <number>11</number>
  <number>12</number>
</numbers>
```

XSL Stylesheet:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
xmlns:fo="http://www.w3.org/1999/XSL/Format" version="1.0">
  <xsl:strip-space elements="*" />

  <xsl:template match="numbers">
    <fo:table>
      <fo:table-column/>
      <fo:table-footer>
        <fo:table-row>
          <fo:table-cell font-weight="bold">
            <fo:block>
```

```

    <fo:retrieve-table-marker retrieve-class-name="subtotal-caption"
retrieve-position-within-table="last-ending"/>
    <fo:retrieve-table-marker retrieve-class-name="subtotal"
retrieve-position-within-table="last-ending"/>
        </fo:block>
    </fo:table-cell>
</fo:table-row>
<fo:retrieve-table-marker retrieve-class-name="continued"
retrieve-position-within-table="last-ending"/>
</fo:table-footer>
<fo:table-body>
    <fo:marker marker-class-name="continued">
        <fo:table-row>
            <fo:table-cell>
                <fo:block>Table continued...</fo:block>
            </fo:table-cell>
        </fo:table-row>
    </fo:marker>
    <fo:marker marker-class-name="subtotal-caption">
        Subtotal:
    </fo:marker>
    <xsl:apply-templates/>
</fo:table-body>
</fo:table>
</xsl:template>

<xsl:template match="number">
    <fo:table-row>
        <fo:marker marker-class-name="subtotal">
            <xsl:value-of select="sum(preceding::number)+text()"/>
        </fo:marker>
        <xsl:if test="position() = last()">
            <fo:marker marker-class-name="continued"/>
            <fo:marker marker-class-name="subtotal-caption">
                Total:
            </fo:marker>
        </xsl:if>
        <fo:table-cell>
            <fo:block>
                <xsl:apply-templates/>
            </fo:block>
        </fo:table-cell>
    </fo:table-row>
</xsl:template>

```

---

```
</xsl:stylesheet>
```

### Result Instance: elements and attributes in the fo: namespace

```
<?xml version="1.0" encoding="UTF-8"?>
<fo:table>
  <fo:table-column/>
  <fo:table-footer>
    <fo:table-row>
      <fo:table-cell font-weight="bold">
        <fo:block>
          <fo:retrieve-table-marker
            retrieve-position-within-table="last-ending"
            retrieve-class-name="subtotal-caption" />
          <fo:retrieve-table-marker
            retrieve-position-within-table="last-ending"
            retrieve-class-name="subtotal" />
        </fo:block>
      </fo:table-cell>
    </fo:table-row>
    <fo:retrieve-table-marker retrieve-class-name="continued"
      retrieve-position-within-table="last-ending" />
  </fo:table-footer>
  <fo:table-body>
    <fo:marker marker-class-name="continued">
      <fo:table-row>
        <fo:table-cell>
          <fo:block>Table continued...</fo:block>
        </fo:table-cell>
      </fo:table-row>
    </fo:marker>
    <fo:marker marker-class-name="subtotal-caption">
      Subtotal:
    </fo:marker>
    <fo:table-row>
      <fo:marker marker-class-name="subtotal">1</fo:marker>
      <fo:table-cell>
        <fo:block>1</fo:block>
      </fo:table-cell>
    </fo:table-row>
    <fo:table-row>
      <fo:marker marker-class-name="subtotal">3</fo:marker>
      <fo:table-cell>
        <fo:block>2</fo:block>
      </fo:table-cell>
```

```

</fo:table-row>
<!-- and so on... -->
<fo:table-row>
  <fo:marker marker-class-name="subtotal">66</fo:marker>
  <fo:table-cell>
    <fo:block>11</fo:block>
  </fo:table-cell>
</fo:table-row>
<fo:table-row>
  <fo:marker marker-class-name="subtotal">78</fo:marker>
  <fo:marker marker-class-name="continued"/>
  <fo:marker marker-class-name="subtotal-caption">
    Total:
  </fo:marker>
  <fo:table-cell>
    <fo:block>12</fo:block>
  </fo:table-cell>
</fo:table-row>
</fo:table-body>
</fo:table>

```

The following is meant as a note that shows by another example how the retrieve-table-marker functions, and how the retrieve scope area set gets determined depending on the properties specified on the fo:retrieve-table-marker.

Consider this XSL-FO result instance:

```

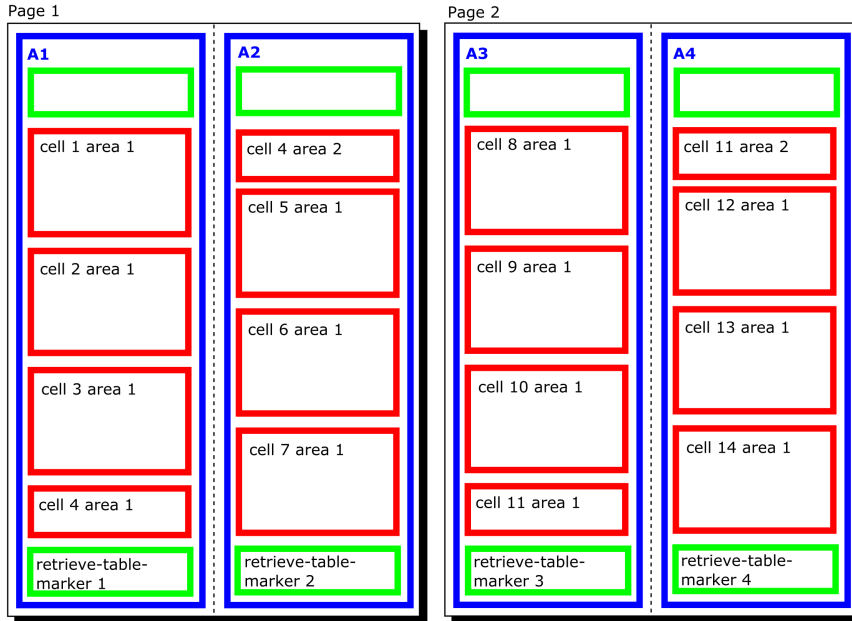
<fo:root xmlns:fo=http://www.w3.org/1999/XSL/Format>
  <fo:layout-master-set>
    <fo:simple-page-master master-name="page ">
      <fo:region-body region-name=" body" column-count="2"/>
    </fo:simple-page-master>
  </fo:layout-master-set>
  <fo:page-sequence master-reference="page">
    <fo:flow fo:flow-name=" body">
      <fo:table>
        <fo:table-column/>
        <fo:table-header>...</fo:table-header>
        <fo:table-footer>
          <fo:table-row>
            <fo:table-cell>
              <fo:block>
                <fo:retrieve-table-marker
                  retrieve-class-name="marker-name"
                  retrieve-position-within-table="See table for values..."
                  retrieve-boundary-within-table="See table for values..."/>
              </fo:block>
            </fo:table-cell>
          </fo:table-row>
        </fo:table-footer>
      </fo:table>
    </fo:flow>
  </fo:page-sequence>
</fo:root>

```



```
        </fo:table-cell>
      </fo:table-row>
</fo:table-footer>
<fo:table-body>
  <fo:table-row>
    <fo:table-cell>
      <!-- cell 1 -->
      <fo:marker marker-class-name="marker-name">
        <!-- marker 1 -->
        ...
      </fo:marker>
      ...
    </fo:table-cell>
  </fo:table-row>
  <!-- and so on ... -->
  <fo:table-row>
    <fo:table-cell>
      <!-- cell 14 -->
      <fo:marker marker-class-name="marker-name">
        <!-- marker 14 -->
        ...
      </fo:marker>
      ...
    </fo:table-cell>
  </fo:table-row>
</fo:table-body>
</fo:table>
</fo:flow>
</fo:page-sequence>
</fo:root>
```

Say the XSL-FO instance results in a paginated document with two page, that can be represented by this illustration:



- retrieve-table-marker x Represents a normal block-area corresponding to the fo:table -header and fo:table-footer and area's returned by the fo:table-header and fo:table-footer. If the text 'retrieve-table-marker x' is present, this indicates that the fo:table-footer contains an fo:retrieve-table-marker with retrieve-class-name="marker"-name
- Represents a normal block-area generated by the fo:table. A subset of these are said to be in the retrieve-scope-area-set
- cell x area y Represents a normal reference-area generated by an fo:table-cell. Cells are numbered 'x' here for reference, and area's generated by the cell are numbered 'y'. Also suppose the every fo:table-cell x has an fo:marker x as its descendant with the marker-class-name="marker-name".

The following table shows the behaviour for retrieve-table-marker 1 depending on the values for the properties:

retrieve-boundary-within-table	retrieve scope area set	primary retrieve scope area	retrieve-position-within-table	selected fo-marker
table	A1	A1	first-starting	1
			first-including-carryover	1
			last-starting	4
			last-ending	3
table-fragment	A1	A1	first-starting	1
			first-including-carryover	1
			last-starting	4
			last-ending	3
page	A1	A1	first-starting	1
			first-including-carryover	1
			last-starting	4

<b>retrieve-boundary-within-table</b>	<b>retrieve scope area set</b>	<b>primary retrieve scope area</b>	<b>retrieve-position-within-table</b>	<b>selected fo-marker</b>
			last-ending	3

The following table shows the behaviour for retrieve-table-marker 2 depending on the values for the properties:

<b>retrieve-boundary-within-table</b>	<b>retrieve scope area set</b>	<b>primary retrieve scope area</b>	<b>retrieve-position-within-table</b>	<b>selected fo-marker</b>
table	A1, A2	A2	first-starting	5
			first-including-carryover	4
			last-starting	7
			last-ending	7
table-fragment	A2	A2	first-starting	5
			first-including-carryover	4
			last-starting	7
			last-ending	7
page	A1, A2	A2	first-starting	5
			first-including-carryover	4
			last-starting	7
			last-ending	7

The following table shows the behaviour for retrieve-table-marker 3 depending on the values for the properties:

<b>retrieve-boundary-within-table</b>	<b>retrieve scope area set</b>	<b>primary retrieve scope area</b>	<b>retrieve-position-within-table</b>	<b>selected fo-marker</b>
table	A1, A2, A3	A3	first-starting	8
			first-including-carryover	8
			last-starting	11
			last-ending	10
table-fragment	A3	A3	first-starting	8
			first-including-carryover	8
			last-starting	11
			last-ending	10
page	A3	A3	first-starting	8
			first-including-carryover	8
			last-starting	11

retrieve-boundary-within-table	retrieve scope area set	primary retrieve scope area	retrieve-position-within-table	selected fo-marker
			last-ending	10

The following table shows the behaviour for retrieve-table-marker 4 depending on the values for the properties:

retrieve-boundary-within-table	retrieve scope area set	primary retrieve scope area	retrieve-position-within-table	selected fo-marker
table	A1, A2, A3, A4	A4	first-starting	12
			first-including-carryover	11
			last-starting	14
			last-ending	14
table-fragment	A4	A4	first-starting	12
			first-including-carryover	11
			last-starting	14
			last-ending	14
page	A3, A4	A4	first-starting	12
			first-including-carryover	11
			last-starting	14
			last-ending	14

### 6.13.2. fo:change-bar-begin

*Common Usage:*

The fo:change-bar-begin is used to indicate the beginning of a "change region" that is ended by the subsequent fo:change-bar-end whose *change-bar-class* property value matches that of the *change-bar-class* property on this fo:change-bar-begin and is at the same nesting level (relative to other fo:change-bar-begin/fo:change-bar-end pairs with the same *change-bar-class* property value) of this fo:change-bar-begin.

The change region is decorated with a change bar down either the start or end edge of the column. That is, a change bar is generated along side of the areas generated within the region-body's non-conditional reference area by the formatting objects "under the change bar influence". All formatting objects after (in document order) this fo:change-bar-begin and up to the matching fo:change-bar-end (or end of document) are considered under the change bar influence of this fo:change-bar-begin.

The position, thickness, style, and color of the generated change bar is determined by the respective properties (see each property definition).

*Areas:*

The `fo:change-bar-begin` formatting object does not in itself generate any areas, but it causes areas to be generated by the ancestor `fo:page-sequence` object, near the start or end edge of a normal-flow-reference-area or region-reference-area.

*Constraints:*

An `fo:change-bar-begin/fo:change-bar-end` pair is considered a matching pair if (1) the value of their *change-bar-class* properties are identical and (2) between (in document order) the `fo:change-bar-begin` and `fo:change-bar-end` formatting objects, the only occurrences of `fo:change-bar-begin` and `fo:change-bar-end` formatting objects of that class (if any) are matching pairs.

Following this `fo:change-bar-begin` in document order, there must be an `fo:change-bar-end` with which it forms a matching pair. If there is no such `fo:change-bar-end`, it is an error, and the implementation should recover by assuming the equivalent of a matching `fo:change-bar-end` at the end of the document.

The generated change bar areas run continuously down the start or end edge of the column within the region body.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- [“change-bar-class”](#) — § 7.30.1 on page 405
- [“change-bar-color”](#) — § 7.30.2 on page 406
- [“change-bar-offset”](#) — § 7.30.3 on page 406
- [“change-bar-placement”](#) — § 7.30.4 on page 407
- [“change-bar-style”](#) — § 7.30.5 on page 408
- [“change-bar-width”](#) — § 7.30.6 on page 408
- [“z-index”](#) — § 7.30.18 on page 414

### 6.13.3. `fo:change-bar-end`

*Common Usage:*

The `fo:change-bar-end` is used to indicate the end of a "change region" that is started by its matching `fo:change-bar-begin`. See § 6.13.2 – [fo:change-bar-begin](#) on page 226 for details.

*Areas:*

The `fo:change-bar-end` formatting object does not in itself generate any areas, but it causes areas to be generated by the ancestor `fo:page-sequence` object, near the start or end edge of a normal-flow-reference-area or region-reference-area.

*Constraints:*

Preceding this `fo:change-bar-end` in document order, there must be an `fo:change-bar-begin` with which it forms a matching pair. If there is no such `fo:change-bar-begin`, it is an error, and the implementation should recover by ignoring this `fo:change-bar-end`.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- [Common Accessibility Properties](#) — § 7.5 on page 237
- [Common Aural Properties](#) — § 7.7 on page 242
- “change-bar-class” — § 7.30.1 on page 405

#### **6.13.4. fo:wrapper**

*Common Usage:*

The fo:wrapper formatting object is used to specify inherited properties for a group of formatting objects.

*Areas:*

The fo:wrapper formatting object returns the sequence of areas created by concatenating the sequences of areas returned by each of the children of the fo:wrapper. If this sequence contains at least one normal area, or if the "id" and "index-key" properties are not specified on the fo:wrapper, then the fo:wrapper does not itself generate any areas.

If the sequence of areas returned to the fo:wrapper contains no normal areas, and the "id" or "index-key" property is specified on the fo:wrapper, then it additionally generates and returns one normal area with inline-progression-dimension and block-progression-dimension set to zero. This area is an inline-area except where this would violate the constraint (on some ancestor area) that an area's children are all block-areas or all inline-areas, but not a mixture. In that case the fo:wrapper must instead generate a block-area.

*Trait Derivation:*

Except for "id", "index-class", and "index-key", the fo:wrapper has no properties that are directly used by it. However, it does serve as a carrier to hold inheritable properties that are utilized by its children.

*Constraints:*

The order of concatenation of the sequences of areas returned by the children of the fo:wrapper is the same order as the children are ordered under the fo:wrapper.

*Contents:*

```
(#PCDATA | %inline; | %block;)*
```

An fo:wrapper is only permitted to have children that would be permitted to be children of the parent of the fo:wrapper, with two exceptions:

- An fo:wrapper may always have a sequence of zero or more fo:markers as its initial children.
- An fo:wrapper that is a child of an fo:multi-properties is only permitted to have children that would be permitted in place of the fo:multi-properties.

This restriction applies recursively.



For example an fo:wrapper that is a child of another fo:wrapper may only have children that would be permitted to be children of the parent fo:wrapper.

*The following properties apply to this formatting object:*

- “id” — § 7.30.8 on page 409
- “index-class” — § 7.24.1 on page 362
- “index-key” — § 7.24.2 on page 363

### 6.13.5. fo:marker

#### *Common Usage:*

The fo:marker is used in conjunction with fo:retrieve-marker or fo:retrieve-table-marker to produce running headers or footers and dynamic table headers or footers. Typical examples include:

- dictionary headers showing the first and last word defined on the page.
- headers showing the page's chapter and section titles.
- subtotals e.g. that give a subtotal of numbers in rows up to the last row on the current page.
- table-continued captions that show whether or not a table is continued after the current page, or was a continuation from a previous page.

The fo:marker has to be an initial child of its parent formatting object.

#### *Areas:*

The fo:marker does not directly produce any area. Its children may be retrieved and formatted from within an fo:static-content or table header/footer, using an fo:retrieve-marker or an fo:retrieve-table-marker respectively, whose "retrieve-class-name" property value is the same as the "marker-class-name" property value of this fo:marker.

#### *Constraints:*

An fo:marker is only permitted as the descendant of an fo:flow.

Note: Property values set on an fo:marker or its ancestors will not be inherited by the children of the fo:marker when they are retrieved by an fo:retrieve-marker or fo:retrieve-table-marker.

It is an error if two or more fo:markers that share the same parent have the same "marker-class-name" property value.

#### *Contents:*

```
(#PCDATA|%inline;|%block;)*
```

An fo:marker may contain any formatting objects that are permitted as a replacement of any fo:retrieve-marker or fo:retrieve-table-marker that retrieves the fo:marker's children. No fo:marker may have as a descendant any fo:marker, fo:retrieve-marker, or fo:retrieve-table-marker.

*The following properties apply to this formatting object:*

- [“marker-class-name”](#) — § 7.25.1 on page 365

### 6.13.6. fo:retrieve-marker

#### *Common Usage:*

The fo:retrieve-marker is used in conjunction with fo:marker to produce running headers or footers. Typical examples include:

- dictionary headers showing the first and last word defined on the page.
- headers showing the page's chapter and section titles.

#### *Areas:*

The fo:retrieve-marker does not directly generate any area. It is (conceptually) replaced by the children of the fo:marker that it retrieves.

*Trait Derivation:*

The properties and traits specified on the ancestors of the fo:retrieve-marker are taken into account when formatting the children of the retrieved fo:marker as if the children had the same ancestors as the fo:retrieve-marker.

*Constraints:*

An fo:retrieve-marker is only permitted as the descendant of an fo:static-content.

The fo:retrieve-marker specifies that the children of a selected fo:marker shall be formatted as though they replaced the fo:retrieve-marker in the formatting tree.

The properties of the fo:retrieve-marker impose a hierarchy of preference on the areas of the area tree. Each fo:marker is conceptually attached to each normal area returned by the fo:marker's parent formatting object. Additionally, an fo:marker is conceptually attached to each non-normal area that is directly generated by the fo:marker's parent formatting object. Conversely, areas generated by any descendant of an fo:flow may have zero or more fo:marker's conceptually attached. The fo:marker whose children are retrieved is the one that is (conceptually) attached to the area that is at the top of this hierarchy.

Every area in the hierarchy is considered preferential to, or "better" than, any area below it in the hierarchy. When comparing two areas to determine which one is better, the terms "first" and "last" refer to the pre-order traversal order of the area tree.

The term "containing page" is used here to mean the page that contains the first area generated or returned by the children of the retrieved fo:marker.

An area that has an attached fo:marker whose "marker-class-name" property value is the same as the "retrieve-class-name" property value of the fo:retrieve-marker is defined to be a qualifying area. Only qualifying areas have positions in the hierarchy.

A qualifying area within a page is better than any qualifying area within a preceding page, except that areas do not have a position in the hierarchy if they are within pages that follow the containing page. If the "retrieve-boundary" property has a value of "page-sequence", then an area does not have a position in the hierarchy if it is on a page from a page-sequence preceding the page-sequence of the containing page. If the "retrieve-boundary" property has a value of "page", then an area does not have a position in the hierarchy if it is not on the containing page.

If the value of the "retrieve-position" property is "first-starting-within-page", then the first qualifying area in the containing page whose "is-first" trait has a value of "true" is better than any other area. If there is no such area, then the first qualifying area in the containing page is better than any other area.

If the value of the "retrieve-position" property is "first-including-carryover", then the first qualifying area in the containing page is better than any other area.

If the value of the "retrieve-position" property is "last-starting-within-page", then the last qualifying area in the containing page whose "is-first" trait has a value of "true" is better than any other area. If there is no such area, then the last qualifying area in the containing page is better than any other area.

If the value of the "retrieve-position" property is "last-ending-within-page", then the last qualifying area in the containing page whose "is-last" trait has a value of "true" is better than any other area. If there is no such area, then the last qualifying area in the containing page is better than any other area.

If the hierarchy of areas is empty, no formatting objects are retrieved.



*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- “[retrieve-class-name](#)” — § 7.25.3 on page 366
- “[retrieve-position](#)” — § 7.25.4 on page 366
- “[retrieve-boundary](#)” — § 7.25.5 on page 367

**6.13.7. fo:retrieve-table-marker***Common Usage:*

The fo:retrieve-table-marker is used in conjunction with fo:marker to produce table-headers and table-footers whose content can change over different pages, different regions or different columns.

Typical examples include:

- dictionary headers showing the first and last word defined in the part of the table on the current page.
- subtotals e.g. that give a subtotal of numbers in rows up to the last row on the current page. For pages with multiple columns and/or multiple regions, the subtotal is to be displayed at the bottom of every table "fragment" in every region or column.
- table-continued captions that show if a table is continued after the current page, or was a continuation from a previous page.

*Areas:*

The fo:retrieve-table-marker does not directly generate any area. It is (conceptually) replaced by the children of the fo:marker that it retrieves.

*Trait Derivation:*

The properties and traits specified on the ancestors of the fo:retrieve-table-marker are taken into account when formatting the children of the retrieved fo:marker as if the children had the same ancestors as the fo:retrieve-table-marker.

*Constraints:*

An fo:retrieve-table-marker is only permitted as the descendant of an fo:table-header or fo:table-footer or as a child of fo:table in a position where fo:table-header or fo:table-footer is permitted.

The fo:retrieve-table-marker specifies that the children of a selected fo:marker shall be formatted as though they replaced the fo:retrieve-table-marker in the formatting tree.

The fo:table that is a parent of both the fo:table-body (that has the fo:markers as its descendants) and the fo:table-header or fo:table-footer that has the fo:retrieve-table-marker as its descendant generates one or more normal block-areas. These are said to be the *retrieve scope area set*. The retrieve scope area set is limited by the constraints specified by retrieve-boundary-within-table property. An area in the retrieve scope area set is called a *retrieve scope area*. There is exactly one retrieve scope area that contains the areas generated or returned by the children on the retrieved fo:marker, and that is called the *primary retrieve scope area*.

The properties of the fo:retrieve-table-marker impose a hierarchy of preference on the descendants of the retrieve scope areas. Each fo:marker is conceptually attached to each normal area returned by the fo:marker's parent formatting object. Additionally, an fo:marker is conceptually attached to each non-

normal area that is directly generated by the fo:marker's parent formatting object. Conversely, areas generated by any descendant of an fo:flow may have zero or more fo:marker's conceptually attached. The fo:marker whose children are retrieved is the one that is conceptually attached to the area that is at the top of this hierarchy.

Every area in the hierarchy is considered preferential to, or "better" than, any area below it in the hierarchy. When comparing two areas to determine which one is better, the terms "first" and "last" refer to the pre-order traversal order of the area tree.

An area that has an attached fo:marker whose "marker-class-name" property value is the same as the "retrieve-class-name" property value of the fo:retrieve-table-marker, is defined to be a qualifying area if it is a descendant of a retrieve scope area. Only qualifying areas have positions in the hierarchy.

If the value of the "retrieve-position-within-table" property is "first-starting", then the first qualifying area in the primary retrieve scope area whose "is-first" trait has a value of "true" is better than any other area. If there is no such area, then the first qualifying area in the primary retrieve scope area is better than any other area. If there is no such area, then the last qualifying area that is a descendant of a retrieve scope area is better than any other area.

If the value of the "retrieve-position-within-table" property is "first-including-carryover", then the first qualifying area in the primary retrieve scope area is better than any other area. If there is no such area, then the last qualifying area that is a descendant of a retrieve scope area is better than any other area.

If the value of the "retrieve-position-within-table" property is "last-starting", then the last qualifying area that is a descendant of a retrieve scope area whose "is-first" trait has a value of "true" is better than any other area. If there is no such area, then the last qualifying area that is a descendant of a retrieve scope area is better than any other area.

If the value of the "retrieve-position-within-table" property is "last-ending", then the last qualifying area that is a descendant of a retrieve scope area whose "is-last" trait has a value of "true" is better than any other area. If there is no such area, then the last qualifying area that is a descendant of a retrieve scope area is better than any other area.

If the hierarchy of areas is empty, no formatting objects are retrieved.

*Contents:*

EMPTY

*The following properties apply to this formatting object:*

- "retrieve-class-name" — § 7.25.3 on page 366
- "retrieve-position-within-table" — § 7.25.6 on page 368
- "retrieve-boundary-within-table" — § 7.25.2 on page 365

## 7. Formatting Properties

### 7.1. Description of Property Groups

The following sections describe the properties of the XSL formatting objects.

A number of properties are copied from the CSS2 specification. In addition, the CSS2 errata all apply. See [CSS2].

---

Properties copied from CSS2 are placed in a box with wide black borders, and properties derived from CSS2 properties are placed in a box with thin black borders.

- The first nine sets of property definitions have been arranged into groups based on similar functionality and the fact that they apply to many formatting objects. In the formatting object descriptions the group name is referred to rather than referring to the individual properties.
  - Common Accessibility Properties  
This set of properties are used to support accessibility.
  - Common Absolute Position Properties  
This set of properties controls the position and size of formatted areas with absolute positioning.
  - Common Aural Properties  
This group of properties controls the aural rendition of the content of a formatting object. They appear on all formatting objects that contain content and other formatting objects that group other formatting objects and where that grouping is necessary for the understanding of the aural rendition. An example of the latter is `fo:table-and-caption`.
  - Common Border, Padding, and Background Properties  
This set of properties controls the backgrounds and borders on the block-areas and inline-areas.
  - Common Font Properties  
This set of properties controls the font selection on all formatting objects that can contain text.
  - Common Hyphenation Properties  
Control of hyphenation for line-breaking, including language, script, and country.
  - Common Margin Properties-Block  
These properties set the spacing and indents surrounding block-level formatting objects.
  - Common Margin Properties-Inline  
These properties set the spacing surrounding inline-level formatting objects.
  - Common Relative Position Properties  
This set of properties controls the position of formatted areas with relative positioning.
- The remaining properties are used on a number of formatting objects. These are arranged into clusters of similar functionality to organize the property descriptions. In the formatting object description the individual properties are referenced.
  - Area Alignment Properties  
Properties that control the alignment of inline-areas with respect to each other, particularly in relation to the mixing of different baselines for different scripts. In addition, there are two properties: "display-align" and "relative-align" that control the placement of block-areas.
  - Area Dimension Properties  
Properties that control the dimensions of both block-areas and inline-areas.
  - Block and Line-related Properties

---

Properties that govern the construction of line-areas and the placement of these line-areas within containing block-areas.

- Character Properties

Properties that govern the presentation of text, including word spacing, letter spacing, and word space treatment and suppression.

- Color-related Properties

Properties that govern color and color-model selection.

- Float-related properties

Properties governing the placement of both side-floats (start- and end-floats) and before-floats ("top" floats in "lr-tb" writing-mode).

- Keeps and Breaks Properties

Properties that control keeps and breaks across pages, columns, and lines, including widow and orphan control and keeping content together.

- Layout-related Properties

These properties control what is "top" ("reference-orientation") as well as clipping, overflow, and column-spanning conditions.

- Leader and Rule Properties

Properties governing the construction of leaders and horizontal rules.

- Properties for Dynamic Effects

Properties governing the presentation and actions associated with links and other dynamic effects.

- Properties for Indexing

Properties governing the creation and presentation of a "back of the book" index.

- Properties for Markers

Properties governing the creation and retrieval of markers. Markers are used typically for "dictionary" headers and footers.

- Properties for Number to String Conversions

Properties used in the construction of page-numbers and other formatter-based numbering.

- Pagination and Layout Properties

These properties govern the sequencing, layout, and instantiation of pages, including: the page size and orientation, sizes of regions on the page-master, the identification and selection of page-masters, division of the body region into columns, and the assignment of content flows to layout regions.

- Table Properties

Properties governing the layout and presentation of tables.

- Writing-mode-related Properties

Properties related to various aspects of "directionality" and writing-mode influencing block-progression-direction and inline-progression-direction.

- Miscellaneous Properties

These properties did not reasonably fit into any of the other categories.


- Shorthand Properties

Shorthand properties that are part of the complete conformance set. Shorthands expand to the individual properties that may be used in place of shorthands.

## 7.2. XSL Areas and the CSS Box Model

This section describes how to interpret property descriptions which incorporate the CSS2 definition of the same property. In CSS2, "boxes" are generated by "elements" in the same way that XSL areas are generated by formatting objects. Any references in the CSS2 definition to "boxes" are to be taken as referring to "areas" in the XSL area model, and where "element" appears in a CSS2 definition it should be taken to refer to a "formatting object".

The CSS term, *positioned element* will in XSL be taken as referring to an XSL FO that has one of the following: an "absolute-position" property with a computed value other than "auto" and/or a "relative-position" property with a computed value other than "static".

 Since in XSL, the "position" property is a shorthand for the "absolute-position" and "relative-position" properties, this is equivalent to the CSS definition.

The position and size of a box are normally taken to refer to the position and size of the area's content-rectangle. Additional correspondences between the CSS2 Box Model and the XSL Area Model are contained in the following table.

Box	Area
top content edge	top edge of the content-rectangle
padding edge	padding-rectangle
content area	interior of the content-rectangle
padding area	region between the content-rectangle and the padding-rectangle
border area	region between the padding-rectangle and the border-rectangle
background	background
containing block	closest ancestor block-area that is not a line-area (see below for additional information when the "containing block" is used as a reference for percentage calculations)
caption	area generated by fo:table-caption
inline box	inline-area
line box	line-area
block box	block-area which is not a line-area
page box	page-area

Box margins map to area traits in accordance with the description of how area traits are computed from property values in [§ 5 – Property Refinement / Resolution](#) on page 44.

### 7.3. Reference Rectangle for Percentage Computations

Allowed conversions for percentages, specified on the property definition, is typically in terms of the content-rectangle of some area. That area is determined as follows:

1. For properties defined in CSS2 referring to the "containing block" the content-rectangle of the closest ancestor block-area that is not a line-area is used.
2. For properties defined by XSL, the property definition specifies which area's content-rectangle is used.
3. Exceptions to the rules above for determining which area is used are:
  - A. When used on fo:root, fo:page-sequence, and fo:title and any descendant of fo:title where there is no ancestor block-area the rectangle used has the dimensions corresponding to the "auto" value of the "page-height" and "page-width" properties. The block-progression-dimension and inline-progression-dimension is then determined based on the computed value of the reference-orientation and writing-mode on the formatting object for which the percentage is computed, or on fo:title in the case of a descendant of fo:title.
  - B. When used on fo:static-content and fo:flow the content rectangle used is based on the region on the first page into which the content is directed. For region-body it is the normal-flow-reference-area and for the other regions it is the region-reference-area.
  - C. When used on fo:footnote-body, and fo:float that generates an area with area-class "xsl-before-float" the rectangle used is the content rectangle of the footnote-reference-area and the before-float-reference-area respectively.
  - D. When used on fo:float that generates an area with area-class "xsl-side-float" the content rectangle used is the closest ancestor block-area that is not a line-area of the area of area-type "xsl-anchor" that was generated by the fo:float.
  - E. When the absolute-position is "fixed", the containing block is defined by the nearest ancestor viewport area. If there is no ancestor viewport area, the containing block is defined by the user agent.
  - F. When the absolute-position is "absolute", the containing block is established by the nearest ancestor area *A* which has an area-class different from xsl-normal or a relative-position of "relative".

In the case where *A* is a block-area, the rectangle used is the padding-rectangle of *A*.

In the case where *A* is an inline-area, generated by some formatting object *F*, the rectangle used is a virtual rectangle whose before-edge and start-edge are the before-edge and start-edge of the first area generated by *F*, and whose after-edge and end-edge are the after-edge and end-edge of the last area generated by *F*. This "rectangle" may have negative extent.

4. If the formatting object generating the identified area generates a sequence of such areas the first area is used for the conversion.

### 7.4. Additional CSS Datatypes

The following "datatypes" are used in the definitions of some CSS2 properties. These are not considered datatypes in XSL, as they are merely notational shorthand and expand as follows:

Datatype	Expansion
<padding-width>	<length>   <percentage>
<border-width>	thin   medium   thick   <length>
<border-style>	none   hidden   dotted   dashed   solid   double   groove   ridge   inset   outset
<generic-voice>	'male'   'female'   'child'
<specific-voice>	values are specific instances (e.g., comedian, trinoids, carlos, lani)
<margin-width>	<length>   <percentage>   auto
<background-color>	shorthand component of background-color
<background-image>	shorthand component of background-image
<background-repeat>	shorthand component of background-repeat
<background-attachment>	shorthand component of background-attachment
<background-position>	shorthand component of background-position
<cue-before>	shorthand component of cue-before
<cue-after>	shorthand component of cue-after
<line-height>	shorthand component of line-height
<language-country>	<string>: a language and optionally a country specifier in conformance with [RFC3066]

## 7.5. Common Accessibility Properties

### 7.5.1. “source-document”

XSL Definition:

*Value:* <uri-specification> [<uri-specification>]\* | none | inherit

*Initial:* none

*Inherited:* no

*Percentages:* N/A

*Media:* all

Values have the following meanings:

#### ***none***

The source document is transient, unknown, or unspecified.

#### ***<uri-specification>***

A URI-specification giving a reference to the (sub)resource used as input to the stylesheet.

This property provides a pointer back to the original XML document(s) used to create this formatting object tree, in accordance with the Dublin Core definition of "Source" ("A Reference to a resource from which the present resource is derived." See: <http://purl.org/DC/documents/rec-dces-19990702.htm>.) The value is not validated by and has no inherent standardized semantics for any XSL processor.

W3C Accessibility guidelines, <http://www.w3.org/TR/WCAG20/>, <http://www.w3.org/TR/ATAG10/>, and <http://www.w3.org/TR/UAAG10/>, strongly encourage the use of this property either on the fo:root or on the first formatting object generated from a given source document.

The URI-specification is useful for alternate renderers (aural readers, etc.) whenever the structure of the formatting object tree is inappropriate for that renderer.

### 7.5.2. “role”

XSL Definition:

<i>Value:</i>	<string>   <uri-specification>   none   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	all

Values have the following meanings:

#### ***none***

Indicates that no semantic tag is cited by this formatting object.

#### ***<string>***

The value is a string representing a semantic identifier that may be used in rendering this formatting object.

#### ***<uri-specification>***

A URI-specification, indicating an RDF resource [RDF]; that is, an XML object that is syntactically valid with respect to the RDF grammar.

This property provides a hint for alternate renderers (aural readers, etc.) as to the role of the XML element or elements that were used to construct this formatting object, if one could be identified during XSLT tree construction. This information can be used to prepare alternate renderings when the normal rendering of a formatting object is not appropriate or satisfactory; for example, the role information can be used to provide better aural renderings of visually formatted material.

To aid alternate renderers, the <string> value should be the qualified name (QName [XML Names] or [XML Names 1.1]) of the element from which this formatting object is constructed. If a QName does not provide sufficient context, the <uri-specification> can be used to identify an RDF resource that describes the role in more detail. This RDF resource may be embedded in the result tree and referenced with a relative URI or fragment identifier, or the RDF resource may be external to the result tree. This specification does not define any standard QName or RDF vocabularies; these are frequently application area dependent. Other groups, for example the Dublin Core, have defined such vocabularies.

This property is not inherited, but all subsidiary nodes of this formatting object that do not bear a role property should utilize the same alternate presentation properties. (It is not inherited because knowledge of the start and end of the formatting object subtree generated by the element may be needed by the renderer.)



## 7.6. Common Absolute Position Properties

### 7.6.1. “absolute-position”

A Property Derived from a CSS2 Property.

<i>Value:</i>	auto   absolute   fixed   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### *auto*

There is no absolute-positioning constraint. Positioning is in accordance with the relative-position property.

#### *absolute*

The area's position (and possibly size) is specified with the "left", "right", "top", and "bottom" properties. These properties specify offsets with respect to the area's nearest ancestor reference area. Absolutely positioned areas are taken out of the normal flow. This means they have no impact on the layout of later siblings. Also, though absolutely positioned areas have margins, they do not collapse with any other margins.

#### *fixed*

The area's position is calculated according to the "absolute" model, but in addition, the area is fixed with respect to some reference. In the case of continuous media, the area is fixed with respect to the viewport (and doesn't move when scrolled). In the case of paged media, the area is fixed with respect to the page, even if that page is seen through a viewport (in the case of a print-preview, for example). Authors may wish to specify "fixed" in a media-dependent way. For instance, an author may want an area to remain at the top of the viewport on the screen, but not at the top of each printed page.

The following additional restrictions apply for paged presentations:

- Only objects with absolute-position="auto" may have page/column breaks.  
For other values any keep and break properties are ignored.
- The area generated is a descendant of the page-area where the first area from the object would have been placed had the object had absolute-position="auto" specified.

If the value is "absolute" or "fixed", any normal areas generated by the formatting object have their area-class changed to *xsl-absolute* or *xsl-fixed*, respectively.

### 7.6.2. “top”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x12>

*Value:* <length> | <percentage> | auto | inherit  
*Initial:* auto  
*Inherited:* no  
*Percentages:* refer to height of containing block  
*Media:* visual

CSS2 Reference: ["top" property](#)

<http://www.w3.org/TR/REC-CSS2/visuren.html#propdef-top>

This property specifies how far a box's top margin edge is offset below the top edge of the box's containing block.

*XSL modifications to the CSS definition:*

See definition of property left (§ 7.6.5 – “left” on page 241).

### 7.6.3. “right”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x12>

*Value:* <length> | <percentage> | auto | inherit  
*Initial:* auto  
*Inherited:* no  
*Percentages:* refer to width of containing block  
*Media:* visual

CSS2 Reference: ["right" property](#)

<http://www.w3.org/TR/REC-CSS2/visuren.html#propdef-right>

This property specifies how far a box's right margin edge is offset to the left of the right edge of the box's containing block.

*XSL modifications to the CSS definition:*

See definition of property left (§ 7.6.5 – “left” on page 241).

### 7.6.4. “bottom”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x12>

<i>Value:</i>	<length>   <percentage>   auto   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to height of containing block
<i>Media:</i>	visual

CSS2 Reference: ["bottom" property](#)

<http://www.w3.org/TR/REC-CSS2/visuren.html#propdef-bottom>

This property specifies how far a box's bottom margin edge is offset above the bottom edge of the box's containing block.

*XSL modifications to the CSS definition:*

See definition of property left (§ 7.6.5 – “left” on page 241).

### 7.6.5. “left”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x12>

<i>Value:</i>	<length>   <percentage>   auto   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["left" property](#)

<http://www.w3.org/TR/REC-CSS2/visuren.html#propdef-left>

This property specifies how far a box's left margin edge is offset to the right of the left edge of the box's containing block.

The values of the four (position offset) properties have the following meanings:

#### *auto*

The effect of this value depends on which of related properties have the value "auto" as well. See the sections on the width and height of absolutely positioned, non-replaced elements for details.

#### *<length>*

The offset is a fixed distance from the reference edge.

**<percentage>**

The offset is a percentage of the containing block's width (for "left" or "right") or "height" (for "top" and "bottom"). For "top" and "bottom", if the "height" of the containing block is not specified explicitly (i.e., it depends on content height), the percentage value is interpreted like "auto".

For absolutely positioned boxes, the offsets are with respect to the box's containing block. For relatively positioned boxes, the offsets are with respect to the outer edges of the box itself (i.e., the box is given a position in the normal flow, then offset from that position according to these properties).

*XSL modifications to the CSS definition:*

These properties set the position of the content-rectangle of the associated area.

The left, right, top, and bottom are interpreted in the prevailing coordinate system (established by the nearest ancestor reference area) and not relative to the "containing block" as in CSS.

If both "left" and "right" have a value other than "auto", then if the "width" is "auto" the width of the content-rectangle is overridden; else the geometry is overconstrained and is resolved in accordance with § 5.3.4 – [Overconstrained Geometry](#) on page 52. Similarly, if both "top" and "bottom" have a value other than "auto", then if the "height" is "auto" the height of the content-rectangle is overridden; else the geometry is overconstrained and is resolved in accordance with § 5.3.4 – [Overconstrained Geometry](#) on page 52.

## 7.7. Common Aural Properties

### 7.7.1. “azimuth”

CSS2 Definition:

<i>Value:</i>	<angle>   [[ left-side   far-left   left   center-left   center   center-right   right   far-right   right-side ]    behind ]   leftwards   rightwards   inherit
<i>Initial:</i>	center
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	aural

CSS2 Reference: ["azimuth" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-azimuth>

### 7.7.2. “cue-after”

CSS2 Definition:

<i>Value:</i>	<uri-specification>   none   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no

*Percentages:* N/A

*Media:* aural

CSS2 Reference: ["cue-after" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-cue-after>

*XSL modifications to the CSS definition:*

The <uri> value has been changed to a <uri-specification>.

### 7.7.3. “cue-before”

CSS2 Definition:

*Value:* <uri-specification> | none | inherit

*Initial:* none

*Inherited:* no

*Percentages:* N/A

*Media:* aural

CSS2 Reference: ["cue-before" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-cue-before>

*XSL modifications to the CSS definition:*

The <uri> value has been changed to a <uri-specification>.

### 7.7.4. “elevation”

CSS2 Definition:

*Value:* <angle> | below | level | above | higher | lower | inherit

*Initial:* level

*Inherited:* yes

*Percentages:* N/A

*Media:* aural

CSS2 Reference: ["elevation" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-elevation>

### 7.7.5. “pause-after”

CSS2 Definition:

<i>Value:</i>	<time>   <percentage>   inherit
<i>Initial:</i>	depends on user agent
<i>Inherited:</i>	no
<i>Percentages:</i>	see prose
<i>Media:</i>	aural

CSS2 Reference: ["pause-after" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-pause-after>

### 7.7.6. “pause-before”

CSS2 Definition:

<i>Value:</i>	<time>   <percentage>   inherit
<i>Initial:</i>	depends on user agent
<i>Inherited:</i>	no
<i>Percentages:</i>	see prose
<i>Media:</i>	aural

CSS2 Reference: ["pause-before" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-pause-before>

### 7.7.7. “pitch”

CSS2 Definition:

<i>Value:</i>	<frequency>   x-low   low   medium   high   x-high   inherit
<i>Initial:</i>	medium
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	aural

CSS2 Reference: ["pitch" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-pitch>

**7.7.8. “pitch-range”**

CSS2 Definition:

<i>Value:</i>	<number>   inherit
<i>Initial:</i>	50
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	aural

CSS2 Reference: ["pitch-range" property](#)<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-pitch-range>**7.7.9. “play-during”**

CSS2 Definition:

<i>Value:</i>	<uri-specification> mix? repeat?   auto   none   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	aural

CSS2 Reference: ["play-during" property](#)<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-play-during>*XSL modifications to the CSS definition:*

The &lt;uri&gt; value has been changed to a &lt;uri-specification&gt;.

**7.7.10. “richness”**

CSS2 Definition:

<i>Value:</i>	<number>   inherit
<i>Initial:</i>	50
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	aural

CSS2 Reference: ["richness" property](#)<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-richness>

### 7.7.11. “speak”

CSS2 Definition:

*Value:* normal | none | spell-out | inherit

*Initial:* normal

*Inherited:* yes

*Percentages:* N/A

*Media:* aural

CSS2 Reference: ["speak" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-speak>

### 7.7.12. “speak-header”

CSS2 Definition:

*Value:* once | always | inherit

*Initial:* once

*Inherited:* yes

*Percentages:* N/A

*Media:* aural

CSS2 Reference: ["speak-header" property](#)

<http://www.w3.org/TR/REC-CSS2/tables.html#propdef-speak-header>

### 7.7.13. “speak-numeral”

CSS2 Definition:

*Value:* digits | continuous | inherit

*Initial:* continuous

*Inherited:* yes

*Percentages:* N/A

*Media:* aural

CSS2 Reference: ["speak-numeral" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-speak-numeral>



### 7.7.14. “speak-punctuation”

CSS2 Definition:

*Value:* code | none | inherit

*Initial:* none

*Inherited:* yes

*Percentages:* N/A

*Media:* aural

CSS2 Reference: ["speak-punctuation" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-speak-punctuation>

### 7.7.15. “speech-rate”

CSS2 Definition:

*Value:* <number> | x-slow | slow | medium | fast | x-fast | faster | slower | inherit

*Initial:* medium

*Inherited:* yes

*Percentages:* N/A

*Media:* aural

CSS2 Reference: ["speech-rate" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-speech-rate>

### 7.7.16. “stress”

CSS2 Definition:

*Value:* <number> | inherit

*Initial:* 50

*Inherited:* yes

*Percentages:* N/A

*Media:* aural

CSS2 Reference: ["stress" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-stress>

### 7.7.17. “voice-family”

CSS2 Definition:

<i>Value:</i>	[[<specific-voice>   <generic-voice> ],]* [<specific-voice>   <generic-voice> ]   inherit
<i>Initial:</i>	depends on user agent
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	aural

CSS2 Reference: ["voice-family" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-voice-family>

### 7.7.18. “volume”

CSS2 Definition:

<i>Value:</i>	<number>   <percentage>   silent   x-soft   soft   medium   loud   x-loud   inherit
<i>Initial:</i>	medium
<i>Inherited:</i>	yes
<i>Percentages:</i>	refer to inherited value
<i>Media:</i>	aural

CSS2 Reference: ["volume" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-volume>

## 7.8. Common Border, Padding, and Background Properties

The following common-border-padding-and-background-properties are taken from CSS2. Those "border", "padding", and "background" properties that have a before, after, start, or end suffix are writing-mode relative and are XSL-only properties.

### 7.8.1. “background-attachment”

CSS2 Definition:

<i>Value:</i>	scroll   fixed   inherit
<i>Initial:</i>	scroll
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["background-attachment" property](#)

<http://www.w3.org/TR/REC-CSS2/colors.html#propdef-background-attachment>

***scroll***

The background-image may scroll with the enclosing object.

***fixed***

The background-image is to be fixed within the viewable area of the enclosing object.

If a background-image is specified, this property specifies whether it is fixed with regard to the viewport (fixed) or scrolls along with the document (scroll).

Even if the image is fixed, it is still only visible when it is in the background or padding area of the element. Thus, unless the image is tiled ("background-repeat: repeat"), it may be invisible.

User agents may treat fixed as scroll. However, it is recommended they interpret fixed correctly, at least for the HTML and BODY elements, since there is no way for an author to provide an image only for those browsers that support fixed. See the section on conformance for details.

*XSL modifications to the CSS definition:*

The last paragraph in the CSS description does not apply.

### 7.8.2. "background-color"

CSS2 Definition:

<i>Value:</i>	<color>   transparent   inherit
<i>Initial:</i>	transparent
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["background-color" property](#)

<http://www.w3.org/TR/REC-CSS2/colors.html#propdef-background-color>

This property sets the background color of an element, either a <color> value or the keyword transparent, to make the underlying colors shine through.

***transparent***

The underlying colors will shine through.

***<color>***

Any valid color specification.

*XSL modifications to the CSS definition:*

XSL adds an "rgb-icc" function (see § 5.10.2 – Color Functions on page 65) as a valid value of this property.

### 7.8.3. “background-image”

CSS2 Definition:

<i>Value:</i>	<uri-specification>   none   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["background-image" property](#)

<http://www.w3.org/TR/REC-CSS2/colors.html#propdef-background-image>

This property sets the background image of an element. When setting a "background-image", authors should also specify a background-color that will be used when the image is unavailable. When the image is available, it is rendered on top of the background color. (Thus, the color is visible in the transparent parts of the image).

Values for this property are either <uri-specification>, to specify the image, or "none", when no image is used.

***none***

No image is specified.

***<uri-specification>***

XSL modifications to the CSS definition:

The <uri> value has been changed to a <uri-specification>.

### 7.8.4. “background-repeat”

CSS2 Definition:

<i>Value:</i>	repeat   repeat-x   repeat-y   no-repeat   inherit
<i>Initial:</i>	repeat
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["background-repeat" property](#)

<http://www.w3.org/TR/REC-CSS2/colors.html#propdef-background-repeat>

If a background image is specified, this property specifies whether the image is repeated (tiled), and how. All tiling covers the content and padding areas of a box. Values have the following meanings:

***repeat***

The image is repeated both horizontally and vertically.

***repeat-x***

The image is repeated horizontally only.

***repeat-y***

The image is repeated vertically only.

***no-repeat***

The image is not repeated: only one copy of the image is drawn.

*XSL modifications to the CSS definition:*

"Horizontal" and "vertical" are defined relative to the reference-orientation; "horizontal" is "left" to "right", and "vertical" is "top" to "bottom".

 Thus for a rotated area the tiling is also rotated. It is, however, independent of the writing-mode.

### 7.8.5. “background-position-horizontal”


A Property Derived from a CSS2 Property.

<i>Value:</i>	<percentage>   <length>   left   center   right   inherit
<i>Initial:</i>	0%
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to the size of the padding-rectangle
<i>Media:</i>	visual

If a "background-image" has been specified, this property specifies its initial position horizontally.


***<percentage>***

Specifies that a point, at the given percentage across the image from left-to-right, shall be placed at a point at the given percentage across, from left-to-right, the area's padding-rectangle.

 For example with a value of 0%, the left-edge of the image is aligned with the left-edge of the area's padding-rectangle. A value of 100% places the right-edge of the image aligned with the right-edge of the padding-rectangle. With a value of 14%, a point 14% across the image is to be placed at a point 14% across the padding-rectangle.

***<length>***

Specifies that the left-edge of the image shall be placed at the specified length to the right of the left-edge of the padding-rectangle.

 For example with a value of 2cm, the left-edge of the image is placed 2cm to the right of the left-edge of the padding-rectangle.

***left***

Same as 0%.

**center**

Same as 50%.

**right**

Same as 100%.

*XSL modifications to the CSS definition:*

"Left" and "right" are defined relative to the reference-orientation.

**7.8.6. “background-position-vertical”**

A Property Derived from a CSS2 Property.

<i>Value:</i>	<percentage>   <length>   top   center   bottom   inherit
<i>Initial:</i>	0%
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to the size of the padding-rectangle
<i>Media:</i>	visual

If a "background-image" has been specified, this property specifies its initial position vertically.

**<percentage>**

Specifies that a point, at the given percentage down the image from top-to-bottom, shall be placed at a point at the given percentage down, from top-to-bottom, the area's padding-rectangle.



For example with a value of 0%, the top-edge of the image is aligned with the top-edge of the area's padding-rectangle. A value of 100% places the bottom-edge of the image aligned with the bottom-edge of the padding-rectangle. With a value of 84%, a point 84% down the image is to be placed at a point 84% down the padding-rectangle.

**<length>**

Specifies that the top-edge of the image shall be placed at the specified length below the top-edge of the padding-rectangle.



For example with a value of 2cm, the top-edge of the image is placed 2cm below the top-edge of the padding-rectangle.

**top**

Same as 0%.

**center**

Same as 50%.

**bottom**

Same as 100%.

*XSL modifications to the CSS definition:*

"Top" and "bottom" are defined relative to the reference-orientation.

### 7.8.7. “border-before-color”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<color>   transparent   inherit
<i>Initial:</i>	the value of the 'color' prop- erty
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the color of the border on the before-edge of a block-area or inline-area.

See definition of property border-top-color (§ 7.8.19 – “border-top-color” on page 258).

*XSL modifications to the CSS definition:*

The value "transparent" has been added to be consistent with the definition of the "border-color" shorthand.

### 7.8.8. “border-before-style”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<border-style>   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the border-style for the before-edge.

See definition of property border-top-style (§ 7.8.20 – “border-top-style” on page 259).

### 7.8.9. “border-before-width”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<border-width>   <length-conditional>   inherit
<i>Initial:</i>	medium
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A

*Media:* visual

Specifies the border-width for the before-edge.

See definition of property border-top-width (§ 7.8.21 – “border-top-width” on page 260).

*XSL modifications to the CSS definition:*

The following value type has been added for XSL:

#### <length-conditional>

A compound value specifying the width and any conditionality of the border for the before-edge.

The .length component is a <length>. It may not be negative. The .conditionality component may be set to "discard" or "retain" to control if the border should be Opt or retained if its associated edge is a leading-edge in a reference-area for areas generated from this formatting object that have an *is-first* value of "false". See § 4.3 – Spaces and Conditionality on page 28 for further details. The initial value of the .conditionality component is "discard".

If border-before-width is specified using <length>, the formatter shall convert the single value to components as follows:

- border-before-width.length: the resultant computed value of the <length>.
- border-before-width.conditional: discard.

If border-before-width is specified using one of the width keywords the .conditional component is set to "discard" and the .length component to a User Agent dependent length.



If the border-style is "none" the computed value of the width is forced to "0pt".

### 7.8.10. “border-after-color”

Writing-mode Relative Equivalent of a CSS2 Property.

*Value:* <color> | transparent | inherit

*Initial:* the value of the 'color' property

*Inherited:* no

*Percentages:* N/A

*Media:* visual

Specifies the color of the border on the after-edge of a block-area or inline-area.

See definition of property border-top-color (§ 7.8.19 – “border-top-color” on page 258).

*XSL modifications to the CSS definition:*

The value "transparent" has been added to be consistent with the definition of the "border-color" shorthand.



### 7.8.11. “border-after-style”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<border-style>   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the border-style for the after-edge.

See definition of property border-top-style (§ 7.8.20 – “border-top-style” on page 259).

### 7.8.12. “border-after-width”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<border-width>   <length-conditional>   inherit
<i>Initial:</i>	medium
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the border-width for the after-edge.

See definition of property border-top-width (§ 7.8.21 – “border-top-width” on page 260).

*XSL modifications to the CSS definition:*

The following value type has been added for XSL:

#### **<length-conditional>**

A compound value specifying the width and any conditionality of the border for the after-edge.

The .length component is a <length>. It may not be negative. The .conditionality component may be set to "discard" or "retain" to control if the border should be 0 or retained if its associated edge is a trailing-edge in a reference-area for areas generated from this formatting object that have an *is-last* value of "false". See § 4.3 – [Spaces and Conditionality](#) on page 28 for further details. The initial value of the .conditionality component is "discard".



If the border-style is "none" the computed value of the width is forced to "0pt".

### 7.8.13. “border-start-color”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<color>   transparent   inherit
<i>Initial:</i>	the value of the 'color' prop- erty
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the color of the border on the start-edge of a block-area or inline-area.

See definition of property border-top-color (§ 7.8.19 – “border-top-color” on page 258).

*XSL modifications to the CSS definition:*

The value "transparent" has been added to be consistent with the definition of the "border-color" shorthand.

### 7.8.14. “border-start-style”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<border-style>   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the border-style for the start-edge.

See definition of property border-top-style (§ 7.8.20 – “border-top-style” on page 259).

### 7.8.15. “border-start-width”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<border-width>   <length-conditional>   inherit
<i>Initial:</i>	medium
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the border-width for the start-edge.



If the border-style is "none" the computed value of the width is forced to "0pt".

See definition of property border-top-width (§ 7.8.21 – “border-top-width” on page 260).

*XSL modifications to the CSS definition:*

The following value type has been added for XSL:

#### <length-conditional>

A compound value specifying the width and any conditionality of the border for the start-edge.

The .length component is a <length>. It may not be negative. The .conditionality component may be set to "discard" or "retain" to control if the border should be 0 or retained if its associated edge is a leading-edge in a line-area for areas generated from this formatting object that have an *is-first* value of "false". See § 4.3.1 – [Space-resolution Rules](#) on page 29 for further details. The initial value of the .conditionality component is "discard".

### 7.8.16. “border-end-color”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<color>   transparent   inherit
<i>Initial:</i>	the value of the 'color' prop- erty
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the color of the border on the end-edge of a block-area or inline-area.

See definition of property border-top-color (§ 7.8.19 – “border-top-color” on page 258).

*XSL modifications to the CSS definition:*

The value "transparent" has been added to be consistent with the definition of the "border-color" shorthand.

### 7.8.17. “border-end-style”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<border-style>   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the border-style for the end-edge.

See definition of property border-top-style (§ 7.8.20 – “border-top-style” on page 259).

### 7.8.18. “border-end-width”

Writing-mode Relative Equivalent of a CSS2 Property.

*Value:* <border-width> | <length-conditional> | inherit

*Initial:* medium

*Inherited:* no

*Percentages:* N/A

*Media:* visual

Specifies the border-width for the end-edge.



If the border-style is "none" the computed value of the width is forced to "0pt".

See definition of property border-top-width (§ 7.8.21 – “border-top-width” on page 260).

*XSL modifications to the CSS definition:*

The following value type has been added for XSL:

#### <length-conditional>

A compound value specifying the width and any conditionality of the border for the end-edge.

The .length component is a <length>. It may not be negative. The .conditionality component may be set to "discard" or "retain" to control if the border should be 0 or retained if its associated edge is a trailing-edge in a line-area for areas generated from this formatting object that have an *is-last* value of "false". See § 4.3.1 – [Space-resolution Rules](#) on page 29 for further details. The initial value of the .conditionality component is "discard".

### 7.8.19. “border-top-color”

CSS2 Definition:

*Value:* <color> | transparent | inherit

*Initial:* the value of the 'color' property

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-top-color" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-top-color>

The 'border-color' property sets the color of the four borders. Values have the following meanings:

***transparent***

The border is transparent (though it may have width).

***<color>***

Any valid color specification.

If an element's border color is not specified with a "border" property, user agents must use the value of the element's "color" property as the computed value for the border color.

*XSL modifications to the CSS definition:*

The value "transparent" has been added to be consistent with the definition of the "border-color" shorthand.

### 7.8.20. "border-top-style"

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x9>

*Value:* <border-style> | inherit

*Initial:* none

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-top-style" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-top-style>

The border style properties specify the line style of a box's border (solid, double, dashed, etc.).

The properties defined in this section refer to the <border-style> value type, which may take one of the following:

***none***

No border. This value forces the computed value of 'border-width' to be '0'.

***hidden***

Same as 'none', except in terms of border conflict resolution for table elements.

***dotted***

The border is a series of dots.

***dashed***

The border is a series of short line segments.

***solid***

The border is a single line segment.

***double***

The border is two solid lines. The sum of the two lines and the space between them equals the value of 'border-width'.

***groove***

The border looks as though it were carved into the canvas.

***ridge***

The opposite of 'groove': the border looks as though it were coming out of the canvas.

***inset***

The border makes the entire box look as though it were embedded in the canvas.

***outset***

The opposite of 'inset': the border makes the entire box look as though it were coming out of the canvas.

All borders are drawn on top of the box's background. The color of borders drawn for values of 'groove', 'ridge', 'inset', and 'outset' should be based on the element's 'border-color' property, but UAs may choose their own algorithm to calculate the actual colors used. For instance, if the 'border-color' has the value 'silver', then a UA could use a gradient of colors from white to dark gray to indicate a sloping border.

Conforming HTML user agents may interpret 'dotted', 'dashed', 'double', 'groove', 'ridge', 'inset', and 'outset' to be 'solid'.

**7.8.21. “border-top-width”**

CSS2 Definition:

<i>Value:</i>	<border-width>   inherit
<i>Initial:</i>	medium
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["border-top-width" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-top-width>

The border width properties specify the width of the border area. The properties defined in this section refer to the <border-width> value type, which may take one of the following values:

***thin***

A thin border.

***medium***

A medium border.

***thick***

A thick border.

***<length>***

The border's thickness has an explicit value. Explicit border widths cannot be negative.

The interpretation of the first three values depends on the user agent. The following relationships must hold, however:

- 'thin' <='medium' <='thick'.
- Furthermore, these widths must be constant throughout a document.

**7.8.22. “border-bottom-color”****CSS2 Definition:**

*Value:* <color> | transparent |  
inherit

*Initial:* the value of the 'color' prop-  
erty

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-bottom-color" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-bottom-color>

Specifies the border color for the bottom-edge.

See definition of property border-top-color (§ 7.8.19 – “border-top-color” on page 258).

***XSL modifications to the CSS definition:***

The value "transparent" has been added to be consistent with the definition of the "border-color" shorthand.

**7.8.23. “border-bottom-style”****CSS2 Definition:**

*Value:* <border-style> |  
inherit

*Initial:* none

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-bottom-style" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-bottom-style>

Specifies the border style for the bottom-edge.

See definition of property border-top-style (§ 7.8.20 – “border-top-style” on page 259).

#### 7.8.24. “border-bottom-width”

CSS2 Definition:

*Value:* <border-width> |  
inherit

*Initial:* medium

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-bottom-width" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-bottom-width>

Specifies the border width for the bottom-edge.

See definition of property border-top-width (§ 7.8.21 – “border-top-width” on page 260).

#### 7.8.25. “border-left-color”

CSS2 Definition:

*Value:* <color> | transparent |  
inherit

*Initial:* the value of the 'color' prop-  
erty

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-left-color" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-left-color>

Specifies the border color for the left-edge.

See definition of property border-top-color (§ 7.8.19 – “border-top-color” on page 258).

*XSL modifications to the CSS definition:*

The value "transparent" has been added to be consistent with the definition of the "border-color" shorthand.



### 7.8.26. “border-left-style”

CSS2 Definition:

<i>Value:</i>	<border-style>   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["border-left-style" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-left-style>

Specifies the border style for the left-edge.

See definition of property border-top-style (§ 7.8.20 – “border-top-style” on page 259).

### 7.8.27. “border-left-width”

CSS2 Definition:

<i>Value:</i>	<border-width>   inherit
<i>Initial:</i>	medium
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["border-left-width" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-left-width>

Specifies the border width for the left-edge.

See definition of property border-top-width (§ 7.8.21 – “border-top-width” on page 260).

### 7.8.28. “border-right-color”

CSS2 Definition:

<i>Value:</i>	<color>   transparent   inherit
<i>Initial:</i>	the value of the 'color' prop- erty
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["border-right-color" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-right-color>

Specifies the border color for the right-edge.

See definition of property border-top-color (§ 7.8.19 – “border-top-color” on page 258).

*XSL modifications to the CSS definition:*

The value "transparent" has been added to be consistent with the definition of the "border-color" shorthand.

### 7.8.29. “border-right-style”

CSS2 Definition:

*Value:* <border-style> |  
inherit

*Initial:* none

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-right-style" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-right-style>

Specifies the border style for the right-edge.

See definition of property border-top-style (§ 7.8.20 – “border-top-style” on page 259).

### 7.8.30. “border-right-width”

CSS2 Definition:

*Value:* <border-width> |  
inherit

*Initial:* medium

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-right-width" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-right-width>

Specifies the border width for the right-edge.

See definition of property border-top-width (§ 7.8.21 – “border-top-width” on page 260).

**7.8.31. “padding-before”**

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<padding-width>   <length-conditional>   inherit
<i>Initial:</i>	Opt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

Specifies the width of the padding on the before-edge of a block-area or inline-area.

See definition of property padding-top (§ 7.8.35 – “padding-top” on page 267).

*XSL modifications to the CSS definition:*

The following value type has been added for XSL:

**<length-conditional>**

A compound value specifying the width and any conditionality of the padding for the before-edge.

The .length component is a <length>. It may not be negative. The .conditionality component may be set to "discard" or "retain" to control if the padding should be 0 or retained if its associated edge is a leading-edge in a reference-area for areas generated from this formatting object that have an *is-first* value of "false". See § 4.3 – [Spaces and Conditionality](#) on page 28 for further details. The initial value of the .conditionality component is "discard".

**7.8.32. “padding-after”**

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<padding-width>   <length-conditional>   inherit
<i>Initial:</i>	Opt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

Specifies the width of the padding on the after-edge of a block-area or inline-area.

See definition of property padding-top (§ 7.8.35 – “padding-top” on page 267).

*XSL modifications to the CSS definition:*

The following value type has been added for XSL:

**<length-conditional>**

A compound value specifying the width and any conditionality of the padding for the after-edge.

The `.length` component is a `<length>`. It may not be negative. The `.conditionality` component may be set to "discard" or "retain" to control if the padding should be 0 or retained if its associated edge is a trailing-edge in a reference-area for areas generated from this formatting object that have an *is-last* value of "false". See § 4.3 – [Spaces and Conditionality](#) on page 28 for further details. The initial value of the `.conditionality` component is "discard".

### 7.8.33. “padding-start”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<code>&lt;padding-width&gt;</code>   <code>&lt;length-conditional&gt;</code>   inherit
<i>Initial:</i>	Opt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

Specifies the width of the padding on the start-edge of a block-area or inline-area.

See definition of property `padding-top` (§ 7.8.35 – “padding-top” on page 267).

*XSL modifications to the CSS definition:*

The following value type has been added for XSL:

#### `<length-conditional>`

A compound value specifying the width and any conditionality of the padding for the start-edge.

The `.length` component is a `<length>`. It may not be negative. The `.conditionality` component may be set to "discard" or "retain" to control if the padding should be 0 or retained if its associated edge is a leading-edge in a line-area for areas generated from this formatting object that have an *is-first* value of "false". See § 4.3.1 – [Space-resolution Rules](#) on page 29 for further details. The initial value of the `.conditionality` component is "discard".

### 7.8.34. “padding-end”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	<code>&lt;padding-width&gt;</code>   <code>&lt;length-conditional&gt;</code>   inherit
<i>Initial:</i>	Opt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

Specifies the width of the padding on the end-edge of a block-area or inline-area.

See definition of property `padding-top` (§ 7.8.35 – “padding-top” on page 267).

XSL modifications to the CSS definition:

The following value type has been added for XSL:

**<length-conditional>**

A compound value specifying the width and any conditionality of the padding for the end-edge.

The .length component is a <length>. It may not be negative. The .conditionality component may be set to "discard" or "retain" to control if the padding should be 0 or retained if its associated edge is a trailing-edge in a line-area for areas generated from this formatting object that have an *is-last* value of "false". See § 4.3.1 – [Space-resolution Rules](#) on page 29 for further details. The initial value of the .conditionality component is "discard".

### 7.8.35. “padding-top”

CSS2 Definition:

<i>Value:</i>	<padding-width>   inherit
<i>Initial:</i>	Opt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["padding-top" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-padding-top>

**<length>**

Specifies the width of the padding on the top-edge of a block-area or inline-area. Unlike margin properties, values for padding properties cannot be negative.

### 7.8.36. “padding-bottom”

CSS2 Definition:

<i>Value:</i>	<padding-width>   inherit
<i>Initial:</i>	Opt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["padding-bottom" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-padding-bottom>

Specifies the width of the padding on the bottom-edge of a block-area or inline-area.

See definition of property padding-top (§ 7.8.35 – “padding-top” on page 267).

### 7.8.37. “padding-left”

CSS2 Definition:

<i>Value:</i>	<padding-width>   inherit
<i>Initial:</i>	0pt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["padding-left" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-padding-left>

Specifies the width of the padding on the left-edge of a block-area or inline-area.

See definition of property padding-top (§ 7.8.35 – “padding-top” on page 267).

### 7.8.38. “padding-right”

CSS2 Definition:

<i>Value:</i>	<padding-width>   inherit
<i>Initial:</i>	0pt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["padding-right" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-padding-right>

Specifies the width of the padding on the right-edge of a block-area or inline-area.

See definition of property padding-top (§ 7.8.35 – “padding-top” on page 267).

## 7.9. Common Font Properties

The following common-font-properties all are taken from CSS2. The reference to CSS2 is: <http://www.w3.org/TR/REC-CSS2/fonts.html>



Although these properties reference the individual properties in the CSS specification, it is recommended that you read the entire font section of the CSS2 specification.

### 7.9.1. Fonts and Font Data


XSL uses an abstract model of a font. This model is described in this section and is based on current font technology as exemplified by the OpenType specification [[OpenType](#)].

A font consists of a collection of glyphs together with the information, the font tables, necessary to use those glyphs to present characters on some medium. A glyph is a recognizable abstract graphic symbol which is independent of any specific design. The combination of the collection of glyphs and the font tables is called the font data.

The font tables include the information necessary to map characters to glyphs, to determine the size of glyph areas and to position the glyph area. Each font table consists of one or more font characteristics, such as the font-weight and font-style.

The geometric font characteristics are expressed in a coordinate system based on the em box. (The em is a relative measure of the height of the glyphs in the font; see § 5.9.7.2 – [Relative Lengths](#) on page 61.) This box that is 1 em high and 1 em wide is called the design space. Points in this design space are expressed in geometric coordinates in terms of fractional units of the em.

The coordinate space of the em box is called the design space coordinate system. For scalable fonts, the curves and lines that are used to draw a glyph are represented using this coordinate system.

 Most often, the (0,0) point in this coordinate system is positioned on the left edge of the em box, but not at the bottom left corner. The Y coordinate of the bottom of a Roman capital letter is usually zero. In addition, the descenders on lower case Roman letters have negative coordinate values.

XSL assumes that the font tables will provide at least three font characteristics: an ascent, a descent and a set of baseline-tables. The coordinate values for these are given in the design space coordinate system. The ascent is given by the vertical coordinate of the top of the em box; the descent is given by the vertical coordinate of the bottom of the em box. The baseline-table is explained below.

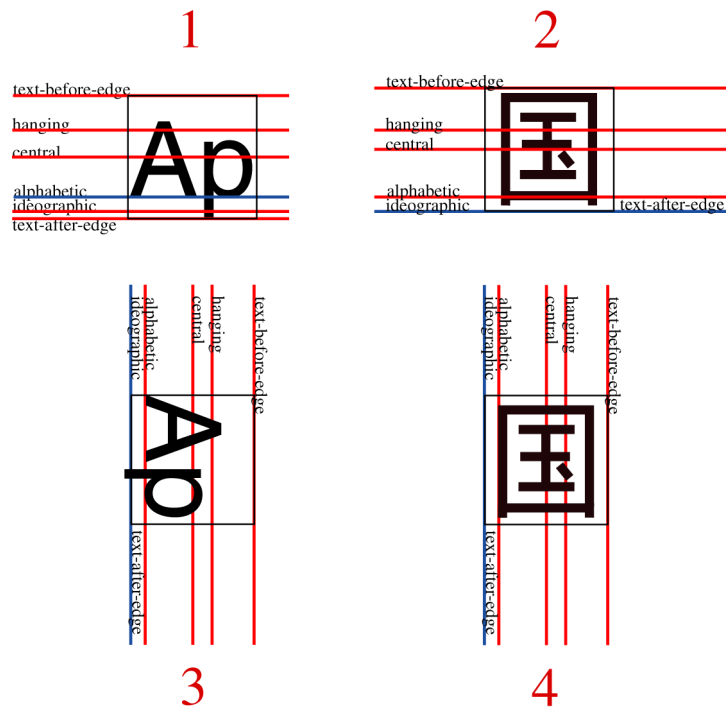
The glyphs of a given script are positioned so that a particular point on each glyph, the *alignment-point*, is aligned with the alignment-points of the other glyphs in that script. The glyphs of different scripts are typically aligned at different points on the glyph. For example, Western glyphs are aligned on the bottoms of the capital letters, certain Indic glyphs (including glyphs from the Devanagari, Gurmukhi and Bengali scripts) are aligned at the top of a horizontal stroke near the top of the glyphs and Far Eastern glyphs are aligned either at the bottom or center of the em box of the glyph. Within a script and within a line of text having a single font-size, the sequence of alignment-points defines, in the inline-progression-direction, a geometric line called a *baseline*. Western and most other alphabetic and syllabic glyphs are aligned to an "alphabetic" baseline, the above Indic glyphs are aligned to a "hanging" baseline and the Far Eastern glyphs are aligned to an "ideographic" baseline.



This figure shows the vertical position of the alignment-point for alphabetic and many syllabic scripts, illustrated by a Roman "A"; for certain Indic scripts, illustrated by a Gurmukhi syllable "ji"; and for ideographic scripts, illustrated by the ideographic glyph meaning "country". The thin black rectangle around the ideographic glyph illustrates the em box for that glyph and shows the typical positioning of the "black marks" of the glyph within the em box.

A *baseline-table* specifies the position of one or more baselines in the design space coordinate system. The function of the baseline table is to facilitate the alignment of different scripts with respect to each other when they are mixed on the same text line. Because the desired relative alignments may depend on which script is dominant in a line (or block), there may be a different baseline table for each script. In addition, different alignment positions are needed for horizontal and vertical writing modes. Therefore,

the font may have a set of baseline tables: typically, one or more for horizontal writing-modes and zero or more for vertical writing-modes.

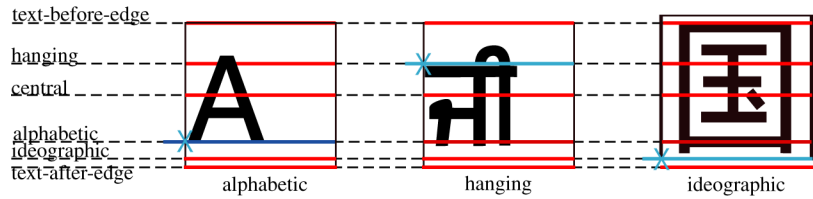


Examples of horizontal and vertical baseline positions. The thin lined box in each example is the "em box". For the Latin glyphs, only the em box of the first glyph is shown. Example 1 shows typical Latin text written horizontally. This text is positioned relative to the alphabetic baseline, shown in blue. Example 2 shows a typical ideographic glyph positioned on the horizontal ideographic baseline. Note that the em box is positioned differently for these two cases. Examples 3 and 4 show the same set of baselines used in vertical writing. The Latin text, example 3, is shown with a glyph-orientation of 90 degrees which is typical for proportionally space Latin glyphs in vertical writing. Even though the ideographic glyph in example 4 is positioned on the vertical ideographic baseline, because it is centered in the em box, all glyphs with the same em box are centered, vertically, with respect to one another. Additional examples showing the positioning of mixed scripts are given in the introductions to § 7.14 – [Area Alignment Properties](#) on page 290 and § 7.29 – [Writing-mode-related Properties](#) on page 391.

The font tables for a font include font characteristics for the individual glyphs in the font. XSL assumes that the font tables include, for each glyph in the font, one width value, one alignment-baseline and one alignment-point for the horizontal writing-modes. If vertical writing-modes are supported, then each glyph must have another width value, alignment-baseline and alignment-point for the vertical writing-modes. (Even though it is specified as a width, for vertical writing-modes the width is used in the vertical direction.)


The script to which a glyph belongs determines an alignment-baseline to which the glyph is to be aligned. The position of this baseline in the design space coordinate system determines the default block-progression-direction position of the alignment-point. The inline-progression-direction position of the alignment-point is on the start-edge of the glyph. (These positions are adjusted according to the specifications in § 7.14.1 – [“alignment-adjust”](#) on page 298 when an instance of a glyph is used in an inline or block formatting object. The "space-start" and/or the "space-end" properties of the fo:character that maps to the glyph may be adjusted to effect "kerning" with respect to adjacent glyphs.)





This figure shows glyphs from three different scripts, each with its em box and within the em box, the baseline table applicable to that glyph. The alignment-point of each glyph is shown by an "X" on the start edge of the em box and by making alignment-baseline blue. The baseline-table of the parent formatting object of the characters that mapped to these glyphs is shown as a set of dashed lines.

In addition to the font characteristics required above, a font may also supply substitution and positioning tables that can be used by a formatter to re-order, combine, and position a sequence of glyphs to make one or more composite glyphs. The combination may be as simple as a ligature, or as complex as an Indic syllable which combines, usually with some re-ordering, multiple consonants and vowel glyphs. See § 4.7.2 – Line-building on page 38.

 If the font tables do not define values for required font characteristics, heuristics may be used to approximate these values.

Make above active!

### 7.9.2. “font-family”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x73>

<i>Value:</i>	[[ <family-name>   <generic-family> ],]* [<family-name>   <generic-family>]   inherit
<i>Initial:</i>	depends on user agent
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["font-family" property](#)

<http://www.w3.org/TR/REC-CSS2/fonts.html#propdef-font-family>

This property specifies a prioritized list of font family names and/or generic family names. To deal with the problem that a single font may not contain glyphs to display all the characters in a document, or that not all fonts are available on all systems, this property allows authors to specify a list of fonts, all of the same style and size, that are tried in sequence to see if they contain a glyph for a certain character. This list is called a font set.

The generic font family will be used if one or more of the other fonts in a font set is unavailable. Although many fonts provide the "missing character" glyph, typically an open box, as its name implies this should not be considered a match except for the last font in a font set.

There are two types of font family names:

#### <family-name>

The name of a font-family of choice. In the previous example [in the CSS2 Recommendation], "Baskerville", "Heisi Mincho W3", and "Symbol" are font families. Font family names containing whitespace should be quoted. If quoting is omitted, any whitespace characters before and after the font name are ignored and any sequence of whitespace characters inside the font name is converted to a single space.

#### <generic-family>

The following generic families are defined: "serif", "sans-serif", "cursive", "fantasy", and "monospace". Please see the section on generic font families for descriptions of these families. Generic font family names are keywords, and therefore must not be quoted.

*XSL modifications to the CSS definition:*

#### <string>

The names are syntactically expressed as strings.



See the expression language for a two-argument "system-font" function that returns a characteristic of a system-font. This may be used, instead of the "font" shorthand, to specify the name of a system-font.

### 7.9.3. "font-selection-strategy"

XSL Definition:

<i>Value:</i>	auto   character-by-character   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual


There is no XSL mechanism to specify a particular font; instead, a *selected font* is chosen from the fonts available to the User Agent based on a set of selection criteria. The *selection criteria* are the following font properties: "font-family", "font-style", "font-variant", "font-weight", "font-stretch", and "font-size", plus, for some formatting objects, one or more characters. These characters are called the *contextual characters*. The contextual characters can be as few as a single character and as many as the entire character complement of the result tree being processed.

Except for the fo:character formatting object, for all other formatting objects where "font-family" applies, the selection criteria consist of the above font properties only. For the fo:character formatting object, the selection criteria are these properties plus either the value of the "character" property of the fo:character alone or that character together with other contextual characters.

The strategy to be followed for selecting a font based on these criteria is specified by the "font-selection-strategy" property.

The "font-family" property is a prioritized list of font family names, which are tried in sequence to find an available font that matches the selection criteria. The font property selection criteria are matched if the corresponding font characteristics match the properties as specified in the property descriptions.

If no matching font is found, a fallback selection is determined in a system-dependent manner.


 This fallback may be to seek a match using a User Agent default "font-family", or it may be a more elaborate fallback strategy where, for example, "Helvetica" would be used as a fallback for "Univers".

If no match has been found for a particular character, there is no selected font and the User Agent should provide a visual indication that a character is not being displayed (for example, using the 'missing character' glyph).

Values of the "font-selection-strategy" property have the following meanings:


#### ***auto***

The selection criterion given by the contextual characters is used in an implementation defined manner.

 An implementation may, for example, use an algorithm where all characters in the result tree having the same set of font selection property values influence the selection, or it may only use the character property of a single fo:character formatting object for which a font is to be selected. Consider, for example, a case where the available fonts include a font that covers all of Latin, Greek and Cyrillic as well as three better quality fonts that cover those three separately, but match each other badly stylistically. An implementation that takes a larger view for its set of contextual characters may consider the glyph complement to allow the selection of the better font if it covers the glyph complement, but to use the broader font to get a consistent style if the glyph complement is larger than any one of the other fonts can cover.

#### ***character-by-character***

The set of contextual characters consists of the single character that is the value of the "character" property of the fo:character for which a font is to be selected.

 This selection strategy is the same as the strategy used to select fonts in CSS.

Describes the criteria for selecting fonts and the different strategies for using these criteria to determine a *selected font*.

### **7.9.4. “font-size”**

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x74>

<i>Value:</i>	<absolute-size>   <relative-size>   <length>   <percentage>   inherit
<i>Initial:</i>	medium
<i>Inherited:</i>	yes, the computed value is inherited
<i>Percentages:</i>	refer to parent element's font size
<i>Media:</i>	visual

CSS2 Reference: ["font-size" property](#)

<http://www.w3.org/TR/REC-CSS2/fonts.html#propdef-font-size>

This property describes the size of the font when set solid. The font size corresponds to the em square, a concept used in typography. Note that certain glyphs may bleed outside their em squares. Values have the following meanings:

#### **<absolute-size>**

An <absolute-size> keyword refers to an entry in a table of font sizes computed and kept by the user agent. Possible values are:

[ xx-small | x-small | small | medium | large | x-large | xx-large ]

On a computer screen a scaling factor of 1.2 is suggested between adjacent indexes; if the "medium" font is 12pt, the "large" font could be 14.4pt. Different media may need different scaling factors. Also, the user agent should take the quality and availability of fonts into account when computing the table. The table may be different from one font family to another. Note. In CSS1, the suggested scaling factor between adjacent indexes was 1.5 which user experience proved to be too large.

#### **<relative-size>**

A <relative-size> keyword is interpreted relative to the table of font sizes and the font size of the parent element. Possible values are:

[ larger | smaller ]

For example, if the parent element has a font size of "medium", a value of "larger" will make the font size of the current element be "large". If the parent element's size is not close to a table entry, the user agent is free to interpolate between table entries or round off to the closest one. The user agent may have to extrapolate table values if the numerical value goes beyond the keywords.

#### **<length>**

A length value specifies an absolute font size (that is independent of the user agent's font table). Negative lengths are illegal.

#### **<percentage>**

A percentage value specifies an absolute font size relative to the parent element's font size. Use of percentage values, or values in "em's", leads to more robust and cascadable stylesheets.

The actual value of this property may differ from the computed value due a numerical value on 'font-size-adjust' and the unavailability of certain font sizes.

Child elements inherit the computed 'font-size' value (otherwise, the effect of 'font-size-adjust' would compound).

#### *XSL modifications to the CSS definition:*

XSL incorporates the following text from CSS2 15.5 (<http://www.w3.org/TR/REC-CSS2/fonts.html#algorithm>) as part of the property definition.

'font-size' must be matched within a UA-dependent margin of tolerance. (Typically, sizes for scalable fonts are rounded to the nearest whole pixel, while the tolerance for bitmapped fonts could be as large as 20%.) Further computations, e.g., by 'em' values in other properties, are based on the computed 'font-size' value.

### 7.9.5. “font-stretch”

CSS2 Definition:

<i>Value:</i>	normal   wider   narrower   ultra-condensed   extra-condensed   condensed   semi-condensed   semi-expanded   expanded   extra-expanded   ultra-expanded   inherit
<i>Initial:</i>	normal
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["font-stretch" property](#)

<http://www.w3.org/TR/REC-CSS2/fonts.html#font-styling>

The 'font-stretch' property selects a normal, condensed, or extended face from a font family.

*ultra-condensed*

*extra-condensed*

*condensed*

*semi-condensed*

*normal*

*semi-expanded*

*expanded*

*extra-expanded*

*ultra-expanded*

Absolute keyword values have the following ordering, from narrowest to widest :

1. ultra-condensed
2. extra-condensed
3. condensed
4. semi-condensed
5. normal
6. semi-expanded
7. expanded
8. extra-expanded
9. ultra-expanded

*wider*

The relative keyword "wider" sets the value to the next expanded value above the inherited value (while not increasing it above "ultra-expanded").

**narrower**

The relative keyword "narrower" sets the value to the next condensed value below the inherited value (while not decreasing it below "ultra-condensed").

**7.9.6. “font-size-adjust”**

CSS2 Definition:

<i>Value:</i>	<number>   none   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["font-size-adjust" property](#)

<http://www.w3.org/TR/REC-CSS2/fonts.html#font-size-props>

In bicameral scripts, the subjective apparent size and legibility of a font are less dependent on their 'font-size' value than on the value of their 'x-height', or, more usefully, on the ratio of these two values, called the aspect value (x-height divided by font size). The higher the aspect value, the more likely it is that a font at smaller sizes will be legible. Inversely, faces with a lower aspect value will become illegible more rapidly below a given threshold size than faces with a higher aspect value. Straightforward font substitution that relies on font size alone may lead to illegible characters.

For example, the popular font Verdana has an aspect value of 0.58; when Verdana's font size 100 units, its x-height is 58 units. For comparison, Times New Roman has an aspect value of 0.46. Verdana will therefore tend to remain legible at smaller sizes than Times New Roman. Conversely, Verdana will often look 'too big' if substituted for Times New Roman at a chosen size.

This property allows authors to specify an aspect value for an element that will preserve the x-height of the first choice font in the substitute font. Values have the following meanings:

**none**

Do not preserve the font's x-height.

**<number>**

Specifies the aspect value. The number refers to the aspect value of the first choice font. The scaling factor for available fonts is computed according to the following formula:

$$y(a/a') = c$$

where:

y="font-size" of first-choice font

a = aspect value of first-choice font

a' = aspect value of available font

c="font-size" to apply to available font

This property allows authors to specify an aspect value for an element that will preserve the x-height of the first choice font in the substitute font.

Font size adjustments take place when computing the actual value of "font-size". Since inheritance is based on the computed value, child elements will inherit unadjusted values.

### 7.9.7. "font-style"

CSS2 Definition:

<i>Value:</i>	normal   italic   oblique   backslant   inherit
<i>Initial:</i>	normal
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["font-style" property](#)

<http://www.w3.org/TR/REC-CSS2/fonts.html#font-styling>

The "font-style" property requests normal (sometimes referred to as "roman" or "upright"), italic, and oblique faces within a font family. Values have the following meanings:

#### ***normal***

Specifies a font that is classified as "normal" in the UA's font database.

#### ***oblique***

Specifies a font that is classified as "oblique" in the UA's font database. Fonts with Oblique, Slanted, or Incline in their names will typically be labeled "oblique" in the font database. A font that is labeled "oblique" in the UA's font database may actually have been generated by electronically slanting a normal font.

#### ***italic***

Specifies a font that is classified as "italic" in the UA's font database, or, if that is not available, one labeled 'oblique'. Fonts with Italic, Cursive, or Kursiv in their names will typically be labeled "italic".

*XSL modifications to the CSS definition:*

The following value type has been added for XSL:

#### ***backslant***

Specifies a font that is classified as "backslant" in the UA's font database.

XSL incorporates the following text from CSS2 15.5 (<http://www.w3.org/TR/REC-CSS2/fonts.html#algorithm>) as part of the property definition, except that for XSL the information is obtained from the font tables of the available fonts.

'italic' will be satisfied if there is either a face in the UA's font database labeled with the CSS keyword 'italic' (preferred) or 'oblique'. Otherwise the values must be matched exactly or font-style will fail.

### 7.9.8. “font-variant”

#### CSS2 Definition:

<i>Value:</i>	normal   small-caps   inherit
<i>Initial:</i>	normal
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

#### CSS2 Reference: ["font-variant" property](#)

<http://www.w3.org/TR/REC-CSS2/fonts.html#font-styling>

In a small-caps font, the glyphs for lowercase letters look similar to the uppercase ones, but in a smaller size and with slightly different proportions. The "font-variant" property requests such a font for bicameral (having two cases, as with Roman script). This property has no visible effect for scripts that are unicameral (having only one case, as with most of the world's writing systems). Values have the following meanings:

#### ***normal***

Specifies a font that is not labeled as a small-caps font.

#### ***small-caps***

Specifies a font that is labeled as a small-caps font. If a genuine small-caps font is not available, user agents should simulate a small-caps font, for example by taking a normal font and replacing the lowercase letters by scaled uppercase characters. As a last resort, unscaled uppercase letter glyphs in a normal font may replace glyphs in a small-caps font so that the text appears in all uppercase letters.

Insofar as this property causes text to be transformed to uppercase, the same considerations as for "text-transform" apply.

#### *XSL modifications to the CSS definition:*

XSL incorporates the following text from CSS2 15.5 (<http://www.w3.org/TR/REC-CSS2/fonts.html#algorithm>) as part of the property definition.

'normal' matches a font not labeled as 'small-caps'; 'small-caps' matches (1) a font labeled as 'small-caps', (2) a font in which the small caps are synthesized, or (3) a font where all lowercase letters are replaced by uppercase letters. A small-caps font may be synthesized by electronically scaling uppercase letters from a normal font.

### 7.9.9. “font-weight”

#### CSS2 Definition:

<i>Value:</i>	normal   bold   bolder   lighter   100   200   300   400   500   600   700   800   900   inherit
<i>Initial:</i>	normal



<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["font-weight" property](#)

<http://www.w3.org/TR/REC-CSS2/fonts.html#font-styling>

The "font-weight" property specifies the weight of the font.

***normal***

Same as "400".

***bold***

Same as "700".

***bolder***

Specifies the next weight that is assigned to a font that is darker than the inherited one. If there is no such weight, it simply results in the next darker numerical value (and the font remains unchanged), unless the inherited value was "900", in which case the resulting weight is also "900".

***lighter***

Specifies the next weight that is assigned to a font that is lighter than the inherited one. If there is no such weight, it simply results in the next lighter numerical value (and the font remains unchanged), unless the inherited value was "100", in which case the resulting weight is also "100".

***<integer>***

These values form an ordered sequence, where each number indicates a weight that is at least as dark as its predecessor.

Child elements inherit the computed value of the weight.

*XSL modifications to the CSS definition:*

XSL incorporates the following text from CSS2 15.5.1 (<http://www.w3.org/TR/REC-CSS2/fonts.html#q46>) as part of the property definition.

The association of other weights within a family to the numerical weight values is intended only to preserve the ordering of weights within that family. User agents must map names to values in a way that preserves visual order; a face mapped to a value must not be lighter than faces mapped to lower values. There is no guarantee on how a user agent will map fonts within a family to weight values. However, the following heuristics tell how the assignment is done in typical cases: If the font family already uses a numerical scale with nine values (as e.g., OpenType does), the font weights should be mapped directly.

If there is both a face labeled Medium and one labeled Book, Regular, Roman or Normal, then the Medium is normally assigned to the '500'.

The font labeled "Bold" will often correspond to the weight value '700'.

If there are fewer than 9 weights in the family, the default algorithm for filling the "holes" is as follows. If '500' is unassigned, it will be assigned the same font as '400'. If any of the values '600', '700', '800', or '900' remains unassigned, they are assigned to the same face as the next darker assigned keyword, if any,

or the next lighter one otherwise. If any of '300', '200', or '100' remains unassigned, it is assigned to the next lighter assigned keyword, if any, or the next darker otherwise.

There is no guarantee that there will be a darker face for each of the 'font-weight' values; for example, some fonts may have only a normal and a bold face, others may have eight different face weights.

## 7.10. Common Hyphenation Properties

### 7.10.1. “country”

XSL Definition:

<i>Value:</i>	none   <country>   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### **none**

Indicates the country is unknown or is not significant to the proper formatting of this object.

#### **<country>**

A country-specifier in conformance with ISO 3166 ([ISO3166-1], [ISO3166-2], and [ISO3166-3]).

Specifies the country to be used by the formatter in language-/locale-coupled services, such as line-justification strategy, line-breaking, and hyphenation.



This may affect line composition in a system-dependent way.

### 7.10.2. “language”

XSL Definition:

<i>Value:</i>	none   <language>   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:


#### **none**


Indicates the language is unknown or is not significant to the proper formatting of this object.

#### **<language>**

A 3-letter code conforming to a [ISO639-2] terminology or bibliographic code or a 2-letter code conforming to a [ISO639] 2-letter code.

Specifies the language to be used by the formatter in language-/locale-coupled services, such as line-justification strategy, line-breaking, and hyphenation.

 This may affect line composition in a system-dependent way.

 ISO 639 2-letter and ISO 639-2 terminology 3-letter codes are also used in the language component of [RFC3066], but user-defined and IANA registered language codes that are allowed in RFC 3066 are not allowed as the value of this property.

### 7.10.3. “script”

XSL Definition:


<i>Value:</i>	none   auto   <script>   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### *auto*

Indicates that the script is determined based on testing a character in the document against script identifiers assigned to Unicode code point ranges.

For fo:character the character tested is given by the "character" property. For other formatting objects the character tested is the first character descendant, as determined by the pre-order traversal of the refined formatting object tree, which has an unambiguous script identifier.

 This provides the automatic differentiation between Kanji, Katakana, Hiragana, and Romanji used in JIS-4051 and similar services in some other countries/languages.


#### *none*

Indicates the script is unknown or is not significant to the proper formatting of this object.

#### <script>

A script specifier in conformance with [ISO15924].

Specifies the script to be used by the formatter in language-/locale-coupled services, such as line-justification strategy, line-breaking, and hyphenation.

 This may affect line composition in a system-dependent way.

### 7.10.4. “hyphenate”

XSL Definition:

<i>Value:</i>	false   true   inherit
<i>Initial:</i>	false

---

<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***false***

Hyphenation may not be used in the line-breaking algorithm between characters with this value.

***true***

Hyphenation may be used in the line-breaking algorithm between characters with this value.

Specifies whether hyphenation is allowed during line-breaking when the formatter is formatting this formatting object. It is implementation defined whether hyphenation may be used between a character for which the value is "true" and one for which the value is "false".

### 7.10.5. “hyphenation-character”

XSL Definition:

<i>Value:</i>	<character>   inherit
<i>Initial:</i>	The Unicode hyphen character U+2010
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

**<character>**

Specifies the Unicode character to be presented when a hyphenation break occurs. The styling properties of this character are those inherited from its containing flow object.

### 7.10.6. “hyphenation-push-character-count”

XSL Definition:

<i>Value:</i>	<number>   inherit
<i>Initial:</i>	2
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

**<number>**

A positive integer. If a non-positive or non-integer value is provided, the value will be rounded to the nearest integer value greater than or equal to 1.

The hyphenation-push-character-count specifies the minimum number of characters in a hyphenated word after the hyphenation character. This is the minimum number of characters in the word pushed to the next line after the line ending with the hyphenation character.

### 7.10.7. “hyphenation-remain-character-count”

XSL Definition:

<i>Value:</i>	<number>   inherit
<i>Initial:</i>	2
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### <number>

A positive integer. If a non-positive or non-integer value is provided, the value will be rounded to the nearest integer value greater than or equal to 1.

The hyphenation-remain-character-count specifies the minimum number of characters in a hyphenated word before the hyphenation character. This is the minimum number of characters in the word left on the line ending with the hyphenation character.

## 7.11. Common Margin Properties-Block

### 7.11.1. “margin-top”

CSS2 Definition:

<i>Value:</i>	<margin-width>   inherit
<i>Initial:</i>	0pt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["margin-top" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-margin-top>

Margin-width may be one of the following:

#### *auto*

See the CSS2 section on computing widths and margins for behavior.

#### <length>

Specifies a fixed width.

#### <percentage>

The percentage is calculated with respect to the width of the generated box's containing block. This is true for 'margin-top' and 'margin-bottom', except in the page context, where percentages refer to page box height.

Negative values for margin properties are allowed, but there may be implementation-specific limits.

Sets the top margin of a box.

*XSL modifications to the CSS definition:*

- Margin-top is provided for compatibility with CSS.
- Details on the mapping of CSS "margin" properties for XSL are given in § 5 – Property Refinement / Resolution on page 44.

### 7.11.2. “margin-bottom”

CSS2 Definition:

<i>Value:</i>	<margin-width>   inherit
<i>Initial:</i>	0pt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["margin-bottom" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-margin-bottom>

Margin-width may be one of the following:

***auto***

See the CSS2 section on computing widths and margins for behavior.

***<length>***

Specifies a fixed width.

***<percentage>***

The percentage is calculated with respect to the width of the generated box's containing block. This is true for 'margin-top' and 'margin-bottom', except in the page context, where percentages refer to page box height.

Negative values for margin properties are allowed, but there may be implementation-specific limits.

Sets the bottom margin of a box.

*XSL modifications to the CSS definition:*

- Margin-bottom is provided for compatibility with CSS.
- Details on the mapping of CSS "margin" properties for XSL are given in § 5 – Property Refinement / Resolution on page 44.

### 7.11.3. “margin-left”

CSS2 Definition:

<i>Value:</i>	<margin-width>   inherit
---------------	--------------------------

<i>Initial:</i>	0pt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["margin-left" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-margin-left>

Margin-width may be one of the following:

***auto***

See the CSS2 section on computing widths and margins for behavior.

***<length>***

Specifies a fixed width.

***<percentage>***

The percentage is calculated with respect to the width of the generated box's containing block.

Negative values for margin properties are allowed, but there may be implementation-specific limits.

Sets the left margin of a box.

*XSL modifications to the CSS definition:*

- Margin-left is provided for compatibility with CSS.
- Details on the mapping of CSS "margin" properties for XSL are given in § 5 – Property Refinement / Resolution on page 44.

#### 7.11.4. “margin-right”

CSS2 Definition:

<i>Value:</i>	<margin-width>   inherit
<i>Initial:</i>	0pt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["margin-right" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-margin-right>

Margin-width may be one of the following:

***auto***

See the CSS2 section on computing widths and margins for behavior.

**<length>**

Specifies a fixed width.

**<percentage>**

The percentage is calculated with respect to the width of the generated box's containing block.

Negative values for margin properties are allowed, but there may be implementation-specific limits.

Sets the right margin of a box.

*XSL modifications to the CSS definition:*

- Margin-right is provided for compatibility with CSS.
- Details on the mapping of CSS "margin" properties for XSL are given in [§ 5 – Property Refinement / Resolution](#) on page 44.

**7.11.5. “space-before”**

XSL Definition:


<i>Value:</i>	<space>   inherit
<i>Initial:</i>	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A (Differs from margin-top in CSS)
<i>Media:</i>	visual

Values have the following meanings:

**<space>**

Specifies the minimum, optimum, and maximum values for the space before any areas generated by this formatting object and the conditionality and precedence of this space.

Specifies the value of the space-specifier for the space before the areas generated by this formatting object. A definition of space-specifiers, and the interaction between space-specifiers occurring in sequence are given in [§ 4.3 – Spaces and Conditionality](#) on page 28.

 A common example of such a sequence is the "space-after" on one area and the "space-before" of its next sibling.

**7.11.6. “space-after”**

XSL Definition:

<i>Value:</i>	<space>   inherit
<i>Initial:</i>	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A (Differs from margin-bottom in CSS)
<i>Media:</i>	visual




Values have the following meanings:

**<space>**

Specifies the minimum, optimum, and maximum values for the space after any areas generated by this formatting object and the conditionality and precedence of this space.

Specifies the value of the space-specifier for the space after the areas generated by this formatting object. A definition of space-specifiers, and the interaction between space-specifiers occurring in sequence are given in § 4.3 – Spaces and Conditionality on page 28.

 A common example of such a sequence is the "space-after" on one area and the "space-before" of its next sibling.

### 7.11.7. “start-indent”

XSL Definition:

<i>Value:</i>	<length>   <percentage>   inherit
<i>Initial:</i>	Opt
<i>Inherited:</i>	yes
<i>Percentages:</i>	refer to inline-progression-dimension of containing reference-area
<i>Media:</i>	visual

Values have the following meanings:

**<length>**

The "start-indent" is specified as a length.

**<percentage>**

The "start-indent" is specified as a percentage of the inline-progression-dimension of the containing reference-area.

For each block-area generated by this formatting object, specifies the distance from the start-edge of the content-rectangle of the containing reference-area to the start-edge of the content-rectangle of that block-area.

This property may have a negative value, which indicates an outdent.

### 7.11.8. “end-indent”

XSL Definition:

<i>Value:</i>	<length>   <percentage>   inherit
<i>Initial:</i>	Opt
<i>Inherited:</i>	yes
<i>Percentages:</i>	refer to inline-progression-dimension of containing reference-area
<i>Media:</i>	visual

Values have the following meanings:

**<length>**

The "end-indent" is specified as a length.

**<percentage>**

The "end-indent" is specified as a percentage of the inline-progression-dimension of the containing reference-area.

For each block-area generated by this formatting object, specifies the distance from the end-edge of the content-rectangle of that block-area to the end-edge of the content-rectangle of the containing reference-area.

This property may have a negative value, which indicates an outdent.

**7.12. Common Margin Properties-Inline****7.12.1. "margin-top"**

See definition in (§ 7.11.1 – "margin-top" on page 283).

**7.12.2. "margin-bottom"**

See definition in (§ 7.11.2 – "margin-bottom" on page 284).

**7.12.3. "margin-left"**

See definition in (§ 7.11.3 – "margin-left" on page 284).

**7.12.4. "margin-right"**

See definition in (§ 7.11.4 – "margin-right" on page 285).

**7.12.5. "space-end"**

XSL Definition:

<i>Value:</i>	<space>   <percentage>   inherit
<i>Initial:</i>	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to inline-progression-dimension of closest ancestor block-area that is not a line-area
<i>Media:</i>	visual

Values have the following meanings:

**<space>**


The "space-end" is specified as a space.

**<percentage>**

The "space-end" is specified as a percentage of the inline-progression-dimension of the closest ancestor block-area.

Specifies the minimum, optimum, and maximum values for the space after any areas generated by this formatting object and the conditionality and precedence of this space.

Specifies the value of the space-specifier for the space after the areas generated by this formatting object. A definition of space-specifiers, and the interaction between space-specifiers occurring in sequence are given in § 4.3 – [Spaces and Conditionality](#) on page 28.

 A common example of such a sequence is the "space-end" on one area and the "space-start" of its next sibling.

### 7.12.6. “space-start”

XSL Definition:

<i>Value:</i>	<space>   <percentage>   inherit
<i>Initial:</i>	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to inline-progression-dimension of closest ancestor block-area that is not a line-area
<i>Media:</i>	visual

Values have the following meanings:

**<space>**


The "space-start" is specified as a space.

**<percentage>**

The "space-start" is specified as a percentage of the inline-progression-dimension of the closest ancestor block-area.

Specifies the minimum, optimum, and maximum values for the space before any areas generated by this formatting object and the conditionality and precedence of this space.

Specifies the value of the space-specifier for the space before the areas generated by this formatting object. A definition of space-specifiers, and the interaction between space-specifiers occurring in sequence are given in § 4.3 – [Spaces and Conditionality](#) on page 28.

 A common example of such a sequence is the "space-end" on one area and the "space-start" of its next sibling.

## 7.13. Common Relative Position Properties

### 7.13.1. “top”

See definition in (§ 7.6.2 – “top” on page 240).

### 7.13.2. “right”

See definition in (§ 7.6.3 – “right” on page 240).

### 7.13.3. “bottom”

See definition in (§ 7.6.4 – “bottom” on page 241).

### 7.13.4. “left”

See definition in (§ 7.6.5 – “left” on page 241).

### 7.13.5. “relative-position”

A Property Derived from a CSS2 Property.

<i>Value:</i>	static   relative   inherit
<i>Initial:</i>	static
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### *static*

The area is normally stacked.

#### *relative*

The area's position is determined as if it was normally stacked. Only during rendering is the area rendered offset relative to this position. The fact that one area is relatively positioned does not influence the position on any other area.

For areas that break over a page boundary, only the portion that would have been on a given page originally is included in the repositioned area on that page. Any portion of the repositioned area that was originally on the current page, but falls off the current page due to repositioning is "off" (typically clipped), thus does not fall onto any other page.

## 7.14. Area Alignment Properties

The area alignment properties control the alignment of child areas with respect to their parent areas. The parent area is given a frame of reference through its scaled-baseline-table. A *scaled-baseline-table* is a compound value with three components: a baseline-identifier for the dominant-baseline, a derived baseline-table with positions for the baselines expressed in design space coordinates, and a baseline-table font-size that is used to scale the positions of the baselines in that baseline table. In a scaled-baseline-table, the positions of the baselines can be adjusted by multiplying the design-space coordinate values by the baseline-table font-size.

The positions of these baselines are illustrated in the following figure:



This figure shows samples of Gurmukhi (a hanging Indic script), Latin and ideographic scripts together with most of the baselines defined below. The thin line around the ideographic glyphs symbolizes the em box in which these glyphs are centered. In this figure, the position of the "text-before-edge" and "text-after-edge" baselines is computed assuming that the "alphabetic" baseline is the dominant-baseline. The

"central" baseline has been omitted from the figure, but it lies halfway between the "text-before-edge" and "text-after-edge" baselines, just about where the "math" baseline is shown.

The baseline-identifiers below are used in this specification. Some of these are determined by baseline-tables contained in a font as described in § 7.9.1 – [Fonts and Font Data](#) on page 268. Others are computed from other font characteristics as described below. Whether determined by the font or computed, a derived baseline-table is constructed with positions for each of the baselines below.

### ***alphabetic***

This identifies the baseline used by most alphabetic and syllabic scripts. These include, but are not limited to, many Western, Southern Indic, Southeast Asian (non-ideographic) scripts.

### ***ideographic***

This identifies the baseline used by ideographic scripts. For historical reasons, this baseline is at the bottom of the ideographic em box and not in the center of the ideographic em box. See the "central" baseline. The ideographic scripts include Chinese, Japanese, Korean, and Vietnamese Chu Nom.

### ***hanging***

This identifies the baseline used by certain Indic scripts. These scripts include Devanagari, Gurmukhi and Bengali.

### ***mathematical***

This identifies the baseline used by mathematical symbols.

### ***central***

This identifies a computed baseline that is at the center of the em box. This baseline lies halfway between the text-before-edge and text-after-edge baselines.



For ideographic fonts, this baseline is often used to align the glyphs; it is an alternative to the ideographic baseline.

### ***middle***

This identifies a baseline that is offset from the alphabetic baseline in the *shift-direction* by 1/2 the value of the x-height font characteristic. The position of this baseline may be obtained from the font data or, for fonts that have a font characteristic for "x-height", it may be computed using 1/2 the "x-height". Lacking either of these pieces of information, the position of this baseline may be approximated by the "central" baseline.

### ***text-before-edge***


This identifies the before-edge of the em box. The position of this baseline may be specified in the baseline-table or it may be calculated.



The position of this baseline is normally around or at the top of the ascenders, but it may not encompass all accents that can appear above a glyph. For these fonts the value of the "ascent" font characteristic is used. For ideographic fonts, the position of this baseline is normally 1 em in the *shift-direction* from the "ideographic" baseline. However, some ideographic fonts have a reduced width in the inline-progression-direction to allow tighter setting. When such a font, designed only for vertical writing-modes, is used in a horizontal writing-mode, the "text-before-edge" baseline may be less than 1 em from the text-after-edge.

***text-after-edge***

This identifies the after-edge of the em box. The position of this baseline may be specified in the baseline-table or it may be calculated.

 For fonts with descenders, the position of this baseline is normally around or at the bottom of the descenders. For these fonts the value of the "descent" font characteristic is used. For ideographic fonts, the position of this baseline is normally at the "ideographic" baseline.


There are, in addition, two computed baselines that are only defined for line areas. For each line-area, there is a dominant-baseline, a baseline-table and a baseline-table font-size which are those of the nearest ancestor formatting object that completely contains the whole line. The "before-edge" and "after-edge" baselines are defined as follows.


***before-edge***

The offset of the "before-edge" baseline of the line from the dominant-baseline of the line is determined by ignoring all inline-areas whose alignment-baseline is either "before-edge" or "after-edge". For the "before-edge", extents are measured from the dominant-baseline in the direction toward the top of the reference-area. The top of the reference-area is defined by the reference-area's *reference-orientation*. The "before-edge" baseline offset is set to the maximum extent of the "before-edges" of the allocation-rectangles of the remaining areas. If all the inline-areas in a line-area are aligned either to the "before-edge" or to the "after-edge", then use the offset of the "text-before-edge" baseline of the line as the offset of the "before-edge" baseline of the line.





***after-edge***

The offset of the "after-edge" baseline of the line from the dominant-baseline of the line is determined by ignoring all inline-areas whose alignment-baseline is *after-edge*. For the "after-edge", extents are measured from the dominant-baseline in the direction toward the bottom of the reference-area. The top of the reference-area is defined by the reference-area's *reference-orientation*. The "after-edge" baseline offset is set to the negative of the maximum of (1) the maximum extent of the "after-edges" of the allocation-rectangles of the remaining areas and (2) the maximum height of the allocation-rectangles of the areas that are ignored minus the offset of the "before-edge" baseline of the line.




 If all the inline-areas in a line-area are aligned to the "after-edge" then the specification for the "before-edge" will set the "before-edge" baseline to coincide with the "text-before-baseline" of the line. Then, case (2) above will determine the offset to the "after-edge" baseline. In this case the allocation-rectangle of one of the areas will extend from the "before-edge" baseline to the "after-edge" baseline.

 The above specifications for "before-edge" and "after-edge" have the following three properties: (1) the allocation-rectangles of all the areas are below the "before-edge", (2) the allocation-rectangles of all the areas are above the "after-edge", and (3) the distance between the "before-edge" and the "after-edge" cannot be decreased without violating (1) or (2). The specified placement of the "before-edge" and "after-edge" is not the only way that (1)-(3) can be satisfied, but it is the only way they can be satisfied with the smallest possible offset to the "before-edge".



Examples showing "before-edge" and "after-edge" alignment:

Ex 1: This is a longer line of text that provides a context for the line with the images aligned on it.  
 This is a line with before-edge , after-edge , middle , and no  alignment.  
 And this is the line of text the follows that line with the aligned objects on it. And, finally, this line illustrates the normal spacing between lines of text in this font.



---

Ex 2: This is a longer line of text that provides a context for the line with the images aligned on it.  
 This is a line with before-edge , after-edge , middle  alignment. And this is the  
 line of text the follows that line with the aligned objects on it. And, finally, this line illustrates the normal spacing between lines of text in this font.




---

Ex 3: This is a longer line of text that provides a context for the line with the images aligned on it.  
 This is a line with before-edge , after-edge  alignment. And this is the line of text  
 the follows that line with the aligned objects on it. And, finally, this line illustrates the normal spacing between lines of text in this font.

---

Ex 4: This is a longer line of text that provides a context for the line with the images aligned on it.  
 This is a line with before-edge , after-edge  alignment. And this is the line of text  
 the follows that line with the aligned objects on it. And, finally, this line illustrates the normal spacing between lines of text in this font.

---

Ex 5: This is a longer line of text that provides a context for the line with the images aligned on it.  
 This is a line with before-edge , after-edge , middle  alignment. And this is the  
 line of text the follows that line with the aligned objects on it. And, finally, this line illustrates the normal spacing between lines of text in this font.

The rectangles with lines or arrows are images with an intrinsic size as shown. The rectangles with no arrows represent images that receive the default, dominant baseline, alignment. The alignment of the other rectangles is at the furthest point from the arrow head (which is in the middle when there are two arrowheads). Examples 1 and 2 show the "before-edge" alignment is determined by the tallest non-"before-edge" aligned objects: in example 1 this is the default aligned, arrowhead free rectangular image and in example 2 this is the double headed arrow rectangle. Examples 3 and 4 show defaulting to the "text-before-edge" when all the areas have either "before-edge" or "after-edge" alignment. In example 3, the images with "before-edge" alignment has a taller member than do the "after-edge" aligned images. In example 4, the tallest image is in the "after-edge" aligned set. Example 5 is a repetition of example 2 with largest image being an "after-edge" aligned image.

The alignment of a formatting object with respect to its parent is determined by three things: the scaled-baseline-table of the parent and the alignment-baseline and alignment-point of the formatting object being aligned. Prior to alignment, the scaled-baseline-table of the parent may be shifted. The property specifications below provide the information necessary to align the parent and child formatting objects.

There are four properties that control alignment of formatting objects to the above set of baselines. These properties are all independent and are designed so that typically only the specification of one of the properties is needed to achieve a particular alignment goal.

The primary baseline alignment property is the "dominant-baseline" property. This property has a compound value with three components. The dominant-baseline-identifier component is the default alignment-baseline to be used when aligning two inline-areas. The baseline-table component specifies the positions of the baselines in the font design space coordinates. (See § 7.9.1 – Fonts and Font Data on

page 268.) The baseline-table acts something like a musical staff; it defines particular points along the *block-progression-direction* to which glyphs and inline formatting objects can be aligned. The baseline-table font-size component provides a scaling factor for the baseline-table.

For convenience, the specification will sometimes refer to the baseline identified by the dominant-baseline-identifier component of the "dominant-baseline" property as the "dominant baseline" (in an abuse of terminology).

A simple example of alignment is shown in the following figure. The figure shows the presentation of two inline formatting objects, one inside the other. These inline formatting objects make up the content of a line in a block where the writing-mode is "lr-tb" and the font is "Helvetica". The structure of the example is as follows:

```
<fo:inline>Apex <fo:inline>Top</fo:inline></fo:inline>
```

Because no properties are specified, the initial values apply. Since a horizontal writing-mode is in use, the dominant-baseline-identifier is set to "alphabetic" and the baseline-table is taken from the nominal font for the block in which the line appears, which, in this case, is Helvetica.

In the figure, the positions of the baselines relative to the current font size are shown as red (staff) lines. These lines are labeled with abbreviations of the names of the baselines (e.g., TBE for "text-before-edge"). The baseline identified by the dominant-baseline-identifier (A) is shown in blue. There is a break in the staff lines to separately show the inner inline formatting object. This is not necessary for this example, but this distinction will become important in subsequent examples.

The "alignment-baseline" property is the primary control on the positioning of an inner formatting object with respect to its parent. For all but fo:character, the initial value of the "alignment-baseline" property is "baseline". This aligns the dominant-baseline of the inner inline formatting object with the dominant baseline of the outer inline formatting object. This is shown by the short blue line that connects the two separated staffs (A) in the figure.

The glyphs determined by the fo:characters that are in the content of the two formatting objects are aligned based on the script to which the glyph belongs. Since this example only has Latin glyphs, they are aligned to the "alphabetic" baseline.



An inner inline formatting object containing Latin characters aligned to an outer inline formatting object also containing Latin characters.

In the next figure, the content of the inner inline formatting object is in Gurmukhi, the script of the Punjabi language. The Gurmukhi syllables are read as, "guru". Rather than use Unicode values for these characters, they are symbolized by placing the Latin transliteration in italic type. The structure of the example becomes:

```
<fo:inline>Apex <fo:inline>guru</fo:inline></fo:inline>
```

The only change from the previous example is that the glyphs of the Gurmukhi script are aligned to the "hanging" baseline of the inner inline formatting object. The alignment of that formatting object itself, with respect to the outer inline formatting object, is unchanged.





An inner inline formatting object containing Gurmukhi characters aligned to an outer inline formatting object containing Latin characters.

In the next figure, fragments of the text of the previous examples make up the content of the outer inline formatting object. The inner inline formatting object has a change of font-size, however. The structure is:

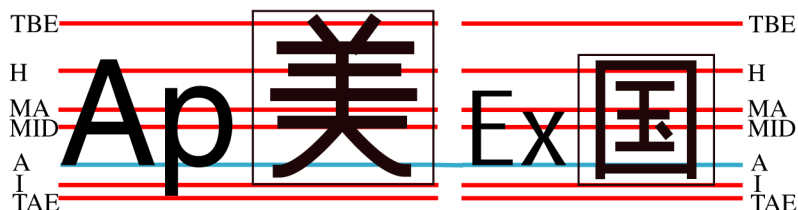
```
<fo:inline>Apguru
  <fo:inline font-size='.75em'>
    Exji
  </fo:inline>
</fo:inline>
```

In this example, the alignment of the inner inline formatting object itself does not change, nor does the alignment of the smaller glyphs inside the inner formatting object. The Latin glyphs are still aligned to the "alphabetic" baseline and the Gurmukhi glyphs, which are pronounced "ji" are aligned to the "hanging" baseline. Note also that just changing the "font-size" property did not change the baseline-table in effect in the inner inline formatting object.



The inner inline formatting object has a reduced font-size.

The next figure is equivalent to the previous example with the Gurmukhi character replaced by ideographic characters. These are aligned to the "ideographic" baseline.



The previous figure re-done with ideographic glyphs instead of Gurmukhi glyphs. The em boxes are shown for the ideograms to clarify the alignment of these glyphs.

To change the scaling of the lines of the baseline table, it is necessary to use the "dominant-baseline" property on the inner inline formatting object. The value of "reset-size" causes the baseline-table font-size to be reset from the font-size of the formatting object on which the "dominant-baseline" property appears. The next figure shows the effect of this, using the structure:

```
<fo:inline>Apguru
  <fo:inline font-size='.75em'
    dominant-baseline='reset-size'>
    Exji
  </fo:inline>
</fo:inline>
```

The alignment of the inner inline formatting object, with respect to the outer inline formatting object, is still determined by aligning the dominant baselines. But, the baseline-table of the inner inline formatting object has been rescaled to the font-size of the inner inline formatting object. Hence the smaller glyphs align with each other.



The baseline-table of the inner inline formatting object has been re-sized to match the font-size of the inner inline formatting object.

But, what if it is more important that the small Gurmukhi glyphs align with the large Gurmukhi glyphs than having the Latin glyphs align. There are at least two ways to achieve this. The structure:

```
<fo:inline dominant-baseline='hanging'>Apguru
  <fo:inline font-size='.75em'
    dominant-baseline='reset-size'>
    Exji
  </fo:inline>
</fo:inline>
```

is illustrated in the next figure. The "hanging" baseline becomes the dominant baseline and the initial value of the "alignment-baseline" property causes the (newly) dominant "hanging" baselines to be aligned as is shown by the connection of the blue baselines.



Changing the dominant baseline to the "hanging" baseline causes the inner inline formatting object to be aligned on its parent's "hanging" baseline.

It is also possible to achieve the effect of the above figure without changing the dominant baseline. Instead it is sufficient to explicitly specify that the inner inline formatting object is aligned on its "hanging" baseline. This is done by:

```
<fo:inline>Apguru
  <fo:inline font-size='.75em'
```

```

    dominant-baseline='reset-size'
    alignment-baseline='hanging'>

```

```

    Exji
  </fo:inline>
</fo:inline>

```

The only change this approach would make in the above figure is to color the "hanging" baseline red and keep the "alphabetic" baseline as the (blue) dominant baseline. This baseline in the inner inline formatting object would not (as it does not in the above figure) align with the "alphabetic" baseline in the outer inline formatting object.

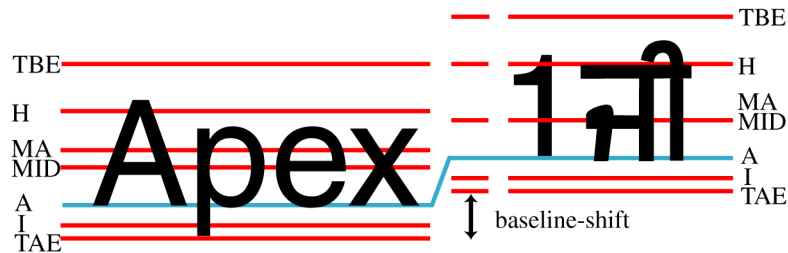
The third baseline alignment property is the "baseline-shift" property. Like the properties other than the "dominant-baseline" property, this property does not change the baseline-table or the baseline-table font-size. It does shift the whole baseline table of the parent formatting object so that when an inner inline formatting object is aligned to one of the parents baselines, the position of the inner inline formatting object is shifted. This is illustrated in the next figure. The structure which creates this figure is:

```

<fo:inline>Ap
  <fo:inline baseline-shift='super'>1ji</fo:inline>
</fo:inline>

```

Because the whole set of baseline-table staff lines are shifted to the position of the superscript baseline: it does not matter to which baseline the glyphs in the superscript are aligned. The European number "1" is aligned to the "alphabetic" baseline and the Gurmukhi syllable "ji" is aligned to the "hanging" baseline.



**Using a "baseline-shift" for a superscript (or a subscript).**

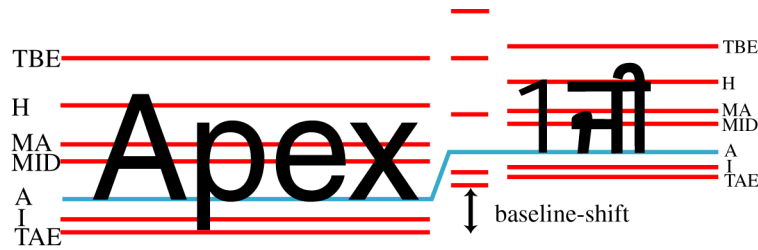
It is more common for the font-size of the superscript text to be smaller than the font-size of the text to which it is appended. Consider:

```

<fo:inline>Ap
  <fo:inline font-size='.75em'
    baseline-shift='super'>
    1ji
  </fo:inline>
</fo:inline>

```

Because changing the font-size on a superscript (or subscript) is common, this is the one case where changing the font-size does cause the baseline-table font-size to be reset when the "dominant-baseline" property has its initial value. After the rescaling, the default alignment to the dominant baseline positions the inline formatting object for the superscript to the dominant baseline position in the shifted baseline-table of the parent formatting object.



Reducing the font-size of the superscript automatically resets the baseline-table size so that mixed languages in the superscript stay mutually aligned.

The fourth alignment property is the "alignment-adjust" property. This property is primarily used for objects, such as some graphics, that do not belong to a particular script and do not have a predefined alignment point. The "alignment-adjust" property allows the author to assign where, on the start-edge of the object, the alignment point for that object lies.

### 7.14.1. "alignment-adjust"

XSL Definition:

<i>Value:</i>	auto   baseline   before-edge   text-before-edge   middle   central   after-edge   text-after-edge   ideographic   alphabetic   hanging   mathematical   <percentage>   <length>   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	see prose
<i>Media:</i>	visual

The "alignment-adjust" property allows more precise alignment of areas generated by formatting objects, in particular for formatting objects, such as graphics, that do not have a baseline-table or lack the desired baseline in their baseline-table. With the "alignment-adjust" property, the position of the baseline identified by the "alignment-baseline" can be explicitly determined.

Values for the property have the following meaning:

#### **auto**

For a glyph, the alignment-point is the intersection of the start-edge of the allocation-rectangle of the glyph-area and the block-progression-direction position of the alignment-point from the font as specified in § 7.9.1 – [Fonts and Font Data](#) on page 268. For other inline-areas, the alignment-point is at the intersection of the start-edge of the allocation-rectangle and the baseline identified by the "alignment-baseline" property if this baseline exists in the baseline-table for the dominant-baseline for the inline-area. If the baseline-identifier does not exist in the baseline-table for the glyph or other inline-area, then the User Agent may either use heuristics to determine where that missing baseline would be or may use the dominant-baseline as a fallback. For areas generated by an fo:external-graphic, or fo:instream-foreign-object, the alignment point is at the intersection of the start-edge and after-edge of the allocation-rectangle of the area.

#### **baseline**

The alignment-point is at the intersection of the start-edge of the allocation-rectangle and the dominant-baseline of the area.

***before-edge***

The alignment-point is at the intersection of the start-edge of the allocation-rectangle and the "before-edge" baseline of the area.

***text-before-edge***

The alignment-point is at the intersection of the start-edge of the allocation-rectangle and the "text-before-edge" baseline of the area.

***central***

The alignment-point is at the intersection of the start-edge of the allocation-rectangle and the "central" baseline of the area.

***middle***

The alignment-point is at the intersection of the start-edge of the allocation-rectangle and the "middle" baseline of the area.

***after-edge***

The alignment-point is at the intersection of the start-edge of the allocation-rectangle and the "after-edge" baseline of the area.

***text-after-edge***

The alignment-point is at the intersection of the start-edge of the allocation-rectangle and the "text-after-edge" baseline of the area.

***ideographic***

The alignment-point is at the intersection of the start-edge of the allocation-rectangle and the "ideographic" baseline of the area.

***alphabetic***

The alignment-point is at the intersection of the start-edge of the allocation-rectangle and the "alphabetic" baseline of the area.

***hanging***

The alignment-point is at the intersection of the start-edge of the allocation-rectangle and the "hanging" baseline of the area.

***mathematical***

The alignment-point is at the intersection of the start-edge of the allocation-rectangle and the "mathematical" baseline of the area.

***<percentage>***

The computed value of the property is this percentage multiplied by the area's computed "height" if the area is generated by an fo:external-graphic or fo:instream-foreign-object, the "font-size" if the area was generated by an fo:character, and the "line-height" otherwise. The alignment-point is on the start-edge of the allocation-rectangle of the area being aligned. Its position along the start-edge relative to the intersection of the dominant-baseline and the start-edge is offset by the computed value. The offset is opposite to the *shift-direction* if that value is positive and in the *shift-direction* if that value is negative value). A value of "0%" makes the dominant-baseline the alignment point.

**<length>**

The alignment-point is on the start-edge of the allocation-rectangle of the area being aligned. Its position along the start-edge relative to the intersection of the dominant-baseline and the start-edge is offset by <length> value. The offset is opposite to the *shift-direction* if that value is positive and in the *shift-direction* if that value is negative. A value of "0cm" makes the dominant-baseline the alignment point.

Implementations must support at least one of the "alignment-adjust" values defined in this Recommendation.

**7.14.2. "alignment-baseline"**

XSL Definition:

<i>Value:</i>	auto   baseline   before-edge   text-before-edge   middle   central   after-edge   text-after-edge   ideographic   alphabetic   hanging   mathematical   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property specifies how an object is aligned with respect to its parent. That is, to which of the parent's baselines the alignment-point of this object is aligned. The alignment-adjust property specifies how the alignment point is determined. It defaults to the baseline with the same name as the computed value of the alignment-baseline property. That is, the position of "ideographic" alignment-point in the *block-progression-direction* is the position of the "ideographic" baseline in the baseline-table of the object being aligned.

Values have the following meanings:

***auto***

The computed value depends on the kind of object on which it is being used. For fo:character, the value is the dominant-baseline of the script to which the character belongs. If the value of the "script" property on the parent formatting object is other than "auto" then use the baseline for that script; otherwise, use the dominant-baseline of the parent. For all other objects, the value is computed as for the "baseline" value.

***baseline***

The alignment-point of the object being aligned is aligned with the dominant-baseline of the parent area.

***before-edge***

The alignment-point of the object being aligned is aligned with the "before-edge" baseline of the parent area.

***text-before-edge***

The alignment-point of the object being aligned is aligned with the "text-before-edge" baseline of the parent area.

***central***

The alignment-point of the object being aligned is aligned with the "central" baseline of the parent area.

***middle***

The alignment-point of the object being aligned is aligned with the "middle" baseline of the parent area.

***after-edge***

The alignment-point of the object being aligned is aligned with the "after-edge" baseline of the parent area.

***text-after-edge***

The alignment-point of the object being aligned is aligned with the "text-after-edge" baseline of the parent area.

***ideographic***

The alignment-point of the object being aligned is aligned with the "ideographic" baseline of the parent area.

***alphabetic***

The alignment-point of the object being aligned is aligned with the "alphabetic" baseline of the parent area.

***hanging***

The alignment-point of the object being aligned is aligned with the "hanging" baseline of the parent area.

***mathematical***

The alignment-point of the object being aligned is aligned with the "mathematical" baseline of the parent area.

Implementations must support at least one of the "alignment-baseline" values defined in this Recommendation.

**7.14.3. “baseline-shift”**

XSL Definition:

<i>Value:</i>	baseline   sub   super   <percentage>   <length>   inherit
<i>Initial:</i>	baseline
<i>Inherited:</i>	no
<i>Percentages:</i>	refers to the "line-height" of the parent area
<i>Media:</i>	visual

The "baseline-shift" property allows repositioning of the dominant-baseline relative to the dominant-baseline of the parent area. The shifted object might be a subscript or superscript. Within the shifted object, the whole baseline-table is offset; not just a single baseline. The amount of the shift is determined from information from the parent area, the subscript or superscript offset from the *nominal-font* of the parent area, percent of the "line-height" of the parent area or an absolute value.

When the value of "baseline-shift" is other than "0", then the baseline-table font-size component of the "dominant-baseline" property is re-computed to use the "font-size" applicable to the formatting object on which the non-zero "baseline-shift" property is specified.

Values for the property have the following meaning:

***baseline***

There is no baseline shift; the dominant-baseline remains in its original position.

***sub***

The dominant-baseline is shifted to the default position for subscripts. The offset to this position is determined using the font data for the nominal font. Because in most fonts the subscript position is normally given relative to the "alphabetic" baseline, the User Agent may compute the effective position for subscripts for superscripts when some other baseline is dominant. The suggested computation is to subtract the difference between the position of the dominant baseline and the position of the "alphabetic" baseline from the position of the subscript. The resulting offset is determined by multiplying the effective subscript position by the dominant baseline-table font-size. If there is no applicable font data the User Agent may use heuristics to determine the offset.

***super***

The dominant-baseline is shifted to the default position for superscripts. The offset to this position is determined using the font data for the nominal font. Because in most fonts the superscript position is normally given relative to the "alphabetic" baseline, the User Agent may compute the effective position for superscripts when some other baseline is dominant. The suggested computation is to subtract the difference between the position of the dominant baseline and the position of the "alphabetic" baseline from the position of the superscript. The resulting offset is determined by multiplying the effective superscript position by the dominant baseline-table font-size. If there is no applicable font data the User Agent may use heuristics to determine the offset.

***<percentage>***

The computed value of the property is this percentage multiplied by the computed "line-height" of the parent area. The dominant-baseline is shifted in the *shift-direction* (positive value) or opposite to the *shift-direction* (negative value) of the parent area by the computed value. A value of "0%" is equivalent to "baseline".

***<length>***

The dominant-baseline is shifted in the *shift-direction* (positive value) or opposite to the *shift-direction* (negative value) of the parent area by the *<length>* value. A value of "0cm" is equivalent to "baseline".



Although it may seem that "baseline-shift" and "alignment-adjust" properties are doing the same thing, there is an important although, perhaps, subtle difference. For "alignment-adjust" the percentage values refer to the "line-height" of the area being aligned. For "baseline-shift" the percentage values refer to the "line-height" of the parent. Similarly, it is the "sub" and "super" offsets of the parent that are used to align the shifted baseline rather than the "sub" or "super" offsets of the areas being positioned. To ensure a consistent subscript or superscript position, it makes more sense to use the parent as the reference rather than the subscript formatting object which may have a changed "line-height" due to "font-size" changes in the subscript or superscript formatting object.

Using the "alignment-adjust" property is more suitable for positioning objects, such as graphics, that have no internal textual structure. Using the "baseline-shift" property is intended for subscripts and superscripts where the positioned object may itself be a textual object. The baseline-shift provides a way to define a specific baseline offset other than the named offsets that are defined relative to the dominant-baseline. In addition, having "base-



line-shift" makes it easier for tool to generate the relevant properties; many formatting programs already have a notion of baseline shift.

#### 7.14.4. “display-align”

XSL Definition:

<i>Value:</i>	auto   before   center   after   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property specifies the alignment, in the block-progression-direction, of the areas that are the children of a reference-area.

Values for the property have the following meaning:

##### *auto*

If the "relative-align" property applies to this formatting object the "relative-align" property is used. If not, this value is treated as if "before" had been specified.

##### *before*

The before-edge of the allocation-rectangle of the first child area is placed coincident with the before-edge of the content-rectangle of the reference-area.

##### *center*

The child areas are placed such that the distance between the before-edge of the allocation-rectangle of the first child area and the before-edge of the content-rectangle of the reference-area is the same as the distance between the after-edge of the allocation-rectangle of the last child area and the after-edge of the content-rectangle of the reference-area.

##### *after*

The after-edge of the allocation-rectangle of the last child area is placed coincident with the after-edge of the content-rectangle of the reference-area.

#### 7.14.5. “dominant-baseline”

XSL Definition:

<i>Value:</i>	auto   use-script   no-change   reset-size   ideographic   alphabetic   hanging   mathematical   central   middle   text-after-edge   text-before-edge   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no (see prose)
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

The "dominant-baseline" property is used to determine or re-determine a scaled-baseline-table. A scaled-baseline-table is a compound value with three components: a baseline-identifier for the dominant-baseline, a derived baseline-table and a baseline-table font-size. Some values of the property re-determine all

three values; other only re-establish the baseline-table font-size. Although this property is not inherited, components of the scaled-baseline-table propagate to child formatting objects if the "auto" value is used on these. When the initial value, "auto", would give an undesired result, this property can be used to explicitly set the desired scaled-baseline-table.



The derived baseline-table is constructed using a baseline-table in the font that corresponds to the computed value of the "writing-mode".

Values for the property have the following meaning:

#### ***auto***

If this property occurs on a block-level formatting object, then the computed value depends on the value of the "script" property. There are two cases. If the value of the "script" property is "auto", then, if the "writing-mode" is horizontal, then the baseline-identifier for the dominant baseline is set to be "alphabetic", else if the "writing-mode" is vertical, then the baseline-identifier for the dominant baseline is set to be "central". On the other hand, if the value of the "script" property is anything other than "auto", then the value of the "script" property is used to select the baseline-identifier for the dominant baseline. The mapping from script to baseline-identifier is taken from the nominal font. The derived baseline-table is constructed using the baseline-table in the nominal font that corresponds to the baseline-identifier for the dominant baseline. The baseline-table font-size is changed to the value of the "font-size" property on this formatting object.

Otherwise, if this property is not on a block-level formatting object, then the baseline-identifier for the dominant baseline, the derived baseline-table, and baseline-table font-size remain the same as those of the parent formatting object. If the computed "baseline-shift" value actually shifts the baseline, then the baseline-table font-size is set to the value of the "font-size" property on the formatting object on which the "dominant-baseline" property occurs, otherwise the baseline-table font-size remains the same as that of the parent formatting object. If there is no parent formatting object, the derived baseline-table is constructed as above for block-level formatting-objects.

#### ***use-script***

The "script" property is used to select the baseline-identifier for the dominant baseline. The mapping from script to baseline-identifier is taken from the nominal font. The derived baseline-table is constructed using the baseline-table in the nominal font that corresponds to the baseline-identifier for the dominant baseline. The baseline-table font-size is changed to the value of the "font-size" property on this formatting object.

#### ***no-change***

The dominant-baseline, the baseline-table, and the baseline-table font-size remain the same as that of the parent formatting object.

#### ***reset-size***

The dominant-baseline and the baseline-table remain the same, but the baseline-table font-size is changed to the value of the "font-size" property on this formatting object. This re-scales the baseline-table for the current "font-size".

#### ***ideographic***

The baseline-identifier for the dominant-baseline is set to be "ideographic". The derived baseline-table is constructed using the "ideographic" baseline-table in the nominal font. The baseline-table font-size is changed to the value of the "font-size" property on this formatting object.

***alphabetic***

The baseline-identifier for the dominant-baseline is set to be "alphabetic". The derived baseline-table is constructed using the "alphabetic" baseline-table in the nominal font. The baseline-table font-size is changed to the value of the "font-size" property on this formatting object.

***hanging***

The baseline-identifier for the dominant-baseline is set to be "hanging". The derived baseline-table is constructed using the "hanging" baseline-table in the nominal font. The baseline-table font-size is changed to the value of the "font-size" property on this formatting object.

***mathematical***

The baseline-identifier for the dominant-baseline is set to be "mathematical". The derived baseline-table is constructed using the "mathematical" baseline-table in the nominal font. The baseline-table font-size is changed to the value of the "font-size" property on this formatting object.

***central***

The baseline-identifier for the dominant-baseline is set to be "central". The derived baseline-table is constructed from the defined baselines in a baseline-table in the nominal font. That font baseline-table is chosen using the following priority order of baseline-table names: "ideographic", "alphabetic", "hanging", "mathematical". The baseline-table font-size is changed to the value of the "font-size" property on this formatting object.

***middle***

The baseline-identifier for the dominant-baseline is set to be "middle". The derived baseline-table is constructed from the defined baselines in a baseline-table in the nominal font. That font baseline-table is chosen using the following priority order of baseline-table names: "alphabetic", "ideographic", "hanging", "mathematical". The baseline-table font-size is changed to the value of the "font-size" property on this formatting object.

***text-after-edge***

The baseline-identifier for the dominant-baseline is set to be "text-after-edge". The derived baseline-table is constructed from the defined baselines in a baseline-table in the nominal font. The choice of which font baseline-table to use from the baseline-tables in the nominal font is implementation defined. The baseline-table font-size is changed to the value of the "font-size" property on this formatting object.



Using the following priority order of baseline-table names: "alphabetic", "ideographic", "hanging", "mathematical" is probably a reasonable strategy for determining which font baseline-table to use.

***text-before-edge***

The baseline-identifier for the dominant-baseline is set to be "text-before-edge". The derived baseline-table is constructed from the defined baselines in a baseline-table in the nominal font. The choice of which baseline-table to use from the baseline-tables in the nominal font is implementation defined. The baseline-table font-size is changed to the value of the "font-size" property on this formatting object.



Using the following priority order of baseline-table names: 'alphabetic', 'ideographic', 'hanging', 'mathematical' is probably a reasonable strategy for determining which font baseline-table to use.

If there is no baseline-table in the nominal font or if the baseline-table lacks an entry for the desired baseline, then the User Agent may use heuristics to determine the position of the desired baseline.

Implementations must support at least one of the "dominant-baseline" values defined in this Recommendation.

#### 7.14.6. “relative-align”

XSL Definition:

<i>Value:</i>	before   baseline   inherit
<i>Initial:</i>	before
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property specifies the alignment, in the block-progression-direction, between two or more areas. If the "display-align" property applies to this formatting object and has a value other than "auto" this property is ignored.

Values for the property have the following meaning:

##### *before*

For an fo:table-cell: for each row, the first child area of all the cells that start in the row and that have this value is placed such that the before-edge of the content-rectangle is placed at the same distance from the row grid. In addition, at least, one of these first child areas of the cells has to be placed with the before-edge of its allocation-rectangle coincident with the before-edge of the content-rectangle of the table-cell.

For an fo:list-item the before-edge of the first area descendant generated by the fo:list-item-label is placed coincident with the before-edge of the area generated by the fo:list-item. Similarly the before-edge of the first area descendant generated by the fo:list-item-body is placed coincident with the before-edge of the area generated by the fo:list-item.

##### *baseline*

For an fo:table-cell: for each row, the first child area of all the cells that start in the row and that have this value is placed such that the dominant-baseline, as specified on the fo:table-row, of the first line is placed at the same distance from the row grid. In addition, at least, one of these first child areas of the cells has to be placed with the before-edge of its allocation-rectangle coincident with the before-edge of the content-rectangle of the table-cell.



That is, for all applicable cells the baseline of all the first lines are all aligned and placed the minimum distance down in the block-progression-direction. It should be noted that the start-edges of the content-rectangles of the cells need not align.

For an fo:list-item the distance between the baseline of the first line-area of the first area descendant generated by the fo:list-item-label is the same as the distance between the baseline of the first line-area of the first area descendant generated by the fo:list-item-body. In addition, at least, one of these first area descendants has to be placed such that the before-edge of its allocation-rectangle is coincident with the before-edge of the content-rectangle of the list-item.

## 7.15. Area Dimension Properties

### 7.15.1. “allowed-height-scale”

XSL Definition:

<i>Value:</i>	[ any   <percentage> ]*   inherit
<i>Initial:</i>	any
<i>Inherited:</i>	yes
<i>Percentages:</i>	intrinsic height
<i>Media:</i>	visual

A sequence of tokens, each specifying an allowed scale-factor value. Tokens have the following meanings:


***any***

No constraint on the scale-factor.

**<percentage>**

Specifies a constraint on the scale-factor to match the specified value.

Specifies a list of constraints on the scale-factor values that may be used when scaling a graphic in the height direction. The list is unordered, except that an "any" value is considered last and is only used if the scaling constraints cannot be satisfied using any of the other specified values.

 It is recommended to include "any" in the list for applications where scrolling is not desired or available.

### 7.15.2. “allowed-width-scale”

XSL Definition:

<i>Value:</i>	[ any   <percentage> ]*   inherit
<i>Initial:</i>	any
<i>Inherited:</i>	yes
<i>Percentages:</i>	intrinsic width
<i>Media:</i>	visual

A sequence of tokens, each specifying an allowed scale-factor value. Tokens have the following meanings:


***any***

No constraint on the scale-factor.

**<percentage>**

Specifies a constraint on the scale-factor to match the specified value.

Specifies a list of constraints on the scale-factor values that may be used when scaling a graphic in the width direction. The list is unordered, except that an "any" value is considered last and is only used if the scaling constraints cannot be satisfied using any of the other specified values.

 It is recommended to include "any" in the list for applications where scrolling is not desired or available.

### 7.15.3. “block-progression-dimension”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	auto   <length>   <percentage>   <length-range>   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	see prose
<i>Media:</i>	visual

This property specifies the block-progression-dimension of the content-rectangle for each area generated by this formatting object. The user may specify an explicit size (<length> or <percentage>) or a <length-range>, allowing the size to be adjusted by the formatter.

This property does not apply when the "line-height" property applies to the same dimension of the areas generated by this formatting object.

Values have the following meanings:

#### ***auto***

No constraint is imposed by this property. The block-progression-dimension is determined by the formatter taking all other constraints into account.

Specifying block-progression-dimension="auto" will set:

- block-progression-dimension.minimum="auto"
- block-progression-dimension.optimum="auto"
- block-progression-dimension.maximum="auto"

#### ***<length>***

Specifies a fixed block-progression-dimension.

Specifying block-progression-dimension=<length> will set:

- block-progression-dimension.minimum=<length>
- block-progression-dimension.optimum=<length>
- block-progression-dimension.maximum=<length>

#### ***<percentage>***

Specifies a percentage block-progression-dimension. The percentage is calculated with respect to the corresponding dimension of the closest area ancestor that was generated by a block-level formatting object. If that dimension is not specified explicitly (i.e., it depends on content's block-progression-dimension), the value is interpreted as "auto".

Specifying block-progression-dimension=<percentage> will set:

- block-progression-dimension.minimum=<percentage>

- `block-progression-dimension.optimum=<percentage>`
- `block-progression-dimension.maximum=<percentage>`

#### **<length-range>**

Specifies the dimension as a length-range, consisting of:

- `block-progression-dimension.optimum`

This is the preferred dimension of the area created; if minimum and maximum are identical, the area is of a fixed dimension. If they are, respectively, smaller and larger than optimum, then the area may be adjusted in dimension within that range.

A value of "auto" may be specified for optimum, indicating that there is no preferred dimension, but that the intrinsic or resolved dimension of the area should be used. If minimum and/or maximum are not also auto, then the dimension shall be constrained between those limits.

- `block-progression-dimension.minimum`
- `block-progression-dimension.maximum`

A value of "auto" may be specified for `block-progression-dimension.maximum`. This indicates that there is no absolute maximum limit, and the object may be sized to its intrinsic size.

Negative values for `block-progression-dimension.minimum`, `block-progression-dimension.optimum`, and `block-progression-dimension.maximum` are invalid and are treated as if "Opt" had been specified.

If the value of `block-progression-dimension.optimum` is "auto" and the computed value of `block-progression-dimension.minimum` is greater than the computed value of `block-progression-dimension.maximum` the `block-progression-dimension.minimum` is treated as if the value of `block-progression-dimension.maximum` had been specified.

#### **7.15.4. “content-height”**

XSL Definition:

<i>Value:</i>	<code>auto</code>   <code>scale-to-fit</code>   <code>scale-down-to-fit</code>   <code>scale-up-to-fit</code>   <code>&lt;length&gt;</code>   <code>&lt;percentage&gt;</code>   <code>inherit</code>
<i>Initial:</i>	<code>auto</code>
<i>Inherited:</i>	<code>no</code>
<i>Percentages:</i>	<code>intrinsic height</code>
<i>Media:</i>	<code>visual</code>

Values have the following meanings:

##### ***auto***

The content-height should be the intrinsic content-height.

***scale-to-fit***

The largest scaling-factor permitted will be applied to the content so that the scaled content-height is less than or equal to the height of the viewport.

***scale-down-to-fit***

If the intrinsic content-height is less than or equal to the height of the viewport the content-height should be the intrinsic content-height. Otherwise the largest scaling-factor permitted will be applied to the content so that the scaled content-height is less than or equal to the height of the viewport.

***scale-up-to-fit***

If the intrinsic content-height is greater than or equal to the height of the viewport the content-height should be the intrinsic content-height. Otherwise the largest scaling-factor permitted will be applied to the content so that the scaled content-height is less than or equal to the height of the viewport.

***<length>***

An absolute size for the content-height. This value implies a certain scaling factor to be applied onto the content.

***<percentage>***

A percentage representing a scaling factor for the content-height.

Specifies the content-height of some object (e.g., an external graphic). If the value is a percentage, the value of this property is the percentage applied to the intrinsic height.

**7.15.5. “content-width”**

XSL Definition:

<i>Value:</i>	auto   scale-to-fit   scale-down-to-fit   scale-up-to-fit   <length>   <percentage>   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	intrinsic width
<i>Media:</i>	visual

Values have the following meanings:

***auto***

The content-width should be the intrinsic content-width.

***scale-to-fit***

The largest scaling-factor permitted will be applied to the content so that the scaled content-width is less than or equal to the width of the viewport.

***scale-down-to-fit***

If the intrinsic content-width is less than or equal to the width of the viewport the content-width should be the intrinsic content-width. Otherwise the largest scaling-factor permitted will be applied to the content so that the scaled content-width is less than or equal to the width of the viewport.



***scale-up-to-fit***

If the intrinsic content-width is greater than or equal to the width of the viewport the content-width should be the intrinsic content-width. Otherwise the largest scaling-factor permitted will be applied to the content so that the scaled content-width is less than or equal to the width of the viewport.

***<length>***

An absolute size for the content-width. This value implies a certain scaling factor to be applied onto the content.

***<percentage>***

A percentage representing a scaling factor for the content-width.

Specifies the content-width of some object (e.g., an external graphic). If the value is a percentage, the value of this property is the percentage applied to the intrinsic width.

**7.15.6. “height”**

CSS2 Definition:

<i>Value:</i>	<length>   <percentage>   auto   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	see prose
<i>Media:</i>	visual

CSS2 Reference: ["height" property](#)

<http://www.w3.org/TR/REC-CSS2/visudet.html#propdef-height>

This property specifies the content height of boxes generated by block-level and replaced elements.

This property does not apply to non-replaced inline-level elements. The height of a non-replaced inline element's boxes is given by the element's (possibly inherited) 'line-height' value.

Values have the following meanings:

***auto***

The height depends on the values of other properties.

***<length>***

Specifies a fixed height.

***<percentage>***

Specifies a percentage height. The percentage is calculated with respect to the height of the generated box's containing block. If the height of the containing block is not specified explicitly (i.e., it depends on content height), the value is interpreted like "auto".

Negative values for 'height' are illegal.

*XSL modifications to the CSS definition:*

In XSL, this property is mapped to either "inline-progression-dimension" or "block-progression-dimension", based on the applicable values of the "writing-mode" and "reference-orientation" properties. Details on the mapping are given in § 5 – Property Refinement / Resolution on page 44.

For a discussion of the "height" property in tables see: <http://www.w3.org/TR/REC-CSS2/tables.html>

### 7.15.7. “inline-progression-dimension”

Writing-mode Relative Equivalent of a CSS2 Property.

<i>Value:</i>	auto   <length>   <percentage>   <length-range>   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	see prose
<i>Media:</i>	visual

This property specifies the inline-progression-dimension of the content-rectangle for each area generated by this formatting object. The user may specify an explicit size (<length> or <percentage>) or a <length-range>, allowing the size to be adjusted by the formatter.

This property does not apply when the "line-height" property applies to the same dimension of the areas generated by this formatting object.

Values have the following meanings:

#### ***auto***

No constraint is imposed by this property. The inline-progression-dimension is determined by the formatter taking all other constraints into account.

Specifying inline-progression-dimension=auto will set:

- inline-progression-dimension.minimum=auto
- inline-progression-dimension.optimum=auto
- inline-progression-dimension.maximum=auto

#### ***<length>***

Specifies a fixed inline-progression-dimension.

Specifying inline-progression-dimension=<length> will set:

- inline-progression-dimension.minimum=<length>
- inline-progression-dimension.optimum=<length>
- inline-progression-dimension.maximum=<length>

#### ***<percentage>***

Specifies a percentage inline-progression-dimension. The percentage is calculated with respect to the corresponding dimension of the closest area ancestor that was generated by a block-level

formatting object. If that dimension is not specified explicitly (i.e., it depends on content's inline-progression-dimension), the value is interpreted as "auto".

Specifying `inline-progression-dimension=<percentage>` will set:

- `inline-progression-dimension.minimum=<percentage>`
- `inline-progression-dimension.optimum=<percentage>`
- `inline-progression-dimension.maximum=<percentage>`

#### **<length-range>**

Specifies the dimension as a length-range, consisting of:

- `inline-progression-dimension.optimum`

This is the preferred dimension of the area created, if minimum and maximum are identical, the area is of a fixed dimension. If they are, respectively, smaller and larger than optimum, then the area may be adjusted in dimension within that range.

A value of "auto" may be specified for optimum, indicating that there is no preferred dimension, but that the intrinsic or resolved dimension of the area should be used. If minimum and/or maximum are not also auto, then the dimension shall be constrained between those limits.

- `inline-progression-dimension.minimum`
- `inline-progression-dimension.maximum`

A value of "auto" may be specified for `inline-progression-dimension.maximum`. This indicates that there is no absolute maximum limit, and the object may be sized to its intrinsic size.

Negative values for `inline-progression-dimension.minimum`, `inline-progression-dimension.optimum`, and `inline-progression-dimension.maximum` are invalid and are treated as if "Opt" had been specified.

### 7.15.8. "max-height"

CSS2 Definition:

<i>Value:</i>	<length>   <percentage>   none   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to height of containing block
<i>Media:</i>	visual

CSS2 Reference: ["max-height" property](#)

<http://www.w3.org/TR/REC-CSS2/visudet.html#propdef-max-height>

These two properties ["max-height" and "min-height"] allow authors to constrain box heights to a certain range. Values have the following meanings:

**none**

(Only on "max-height") No limit on the height of the box.

**<length>**

Specifies a fixed maximum computed height.

**<percentage>**

Specifies a percentage for determining the computed value. The percentage is calculated with respect to the height of the generated box's containing block. If the height of the containing block is not specified explicitly (i.e., it depends on content height), the percentage value is interpreted like "none".

*XSL modifications to the CSS definition:*

In XSL, this property is mapped to either "inline-progression-dimension" or "block-progression-dimension", based on the applicable values of the "writing-mode" and "reference-orientation" properties. Details on the mapping are given in § 5 – [Property Refinement / Resolution](#) on page 44.

**7.15.9. “max-width”**

CSS2 Definition:

<i>Value:</i>	<length>   <percentage>   none   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["max-width" property](#)

<http://www.w3.org/TR/REC-CSS2/visudet.html#propdef-max-width>

These two properties ["max-width" and "min-width"] allow authors to constrain box widths to a certain range. Values have the following meanings:

**none**

(Only on "max-width") No limit on the width of the box.

**<length>**

Specifies a fixed maximum computed width.

**<percentage>**

Specifies a percentage for determining the computed value. The percentage is calculated with respect to the width of the generated box's containing block.

*XSL modifications to the CSS definition:*

In XSL, this property is mapped to either "inline-progression-dimension" or "block-progression-dimension", based on the applicable values of the "writing-mode" and "reference-orientation" properties. Details on the mapping are given in § 5 – [Property Refinement / Resolution](#) on page 44.

### 7.15.10. “min-height”

CSS2 Definition:

<i>Value:</i>	<length>   <percentage>   inherit
<i>Initial:</i>	Opt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to height of containing block
<i>Media:</i>	visual

CSS2 Reference: ["min-height" property](#)

<http://www.w3.org/TR/REC-CSS2/visudet.html#propdef-min-height>

These two properties ["max-height" and "min-height"] allow authors to constrain box heights to a certain range. Values have the following meanings:

**<length>**

Specifies a fixed minimum computed height.

**<percentage>**

Specifies a percentage for determining the computed value. The percentage is calculated with respect to the height of the generated box's containing block. If the height of the containing block is not specified explicitly (i.e., it depends on content height), the percentage value is interpreted like "Opt".

*XSL modifications to the CSS definition:*

In XSL, this property is mapped to either "inline-progression-dimension" or "block-progression-dimension", based on the applicable values of the "writing-mode" and "reference-orientation" properties. Details on the mapping are given in § 5 – [Property Refinement / Resolution](#) on page 44.

### 7.15.11. “min-width”

CSS2 Definition:

<i>Value:</i>	<length>   <percentage>   inherit
<i>Initial:</i>	depends on UA
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["min-width" property](#)

<http://www.w3.org/TR/REC-CSS2/visudet.html#propdef-min-width>

These two properties ["max-width" and "min-width"] allow authors to constrain box widths to a certain range. Values have the following meanings:

**<length>**

Specifies a fixed minimum computed width.

**<percentage>**

Specifies a percentage for determining the computed value. The percentage is calculated with respect to the width of the generated box's containing block.

*XSL modifications to the CSS definition:*

In XSL, this property is mapped to either "inline-progression-dimension" or "block-progression-dimension", based on the applicable values of the "writing-mode" and "reference-orientation" properties. Details on the mapping are given in § 5 – [Property Refinement / Resolution](#) on page 44.

**7.15.12. “scaling”**

XSL Definition:

<i>Value:</i>	uniform   non-uniform   inherit
<i>Initial:</i>	uniform
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***uniform***

Scaling should preserve the aspect ratio.

***non-uniform***

Scaling need not preserve the aspect ratio.

Specifies whether scaling needs to preserve the intrinsic aspect ratio.

**7.15.13. “scaling-method”**

XSL Definition:

<i>Value:</i>	auto   integer-pixels   resample-any-method   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***auto***

The User Agent is free to choose either resampling, integer scaling, or any other scaling method.

***integer-pixels***

The User Agent should scale the image such that each pixel in the original image is scaled to the nearest integer number of device-pixels that yields an image less-than-or-equal-to the image size derived from the content-height, content-width, and scaling properties.

***resample-any-method***

The User Agent should resample the supplied image to provide an image that fills the size derived from the content-height, content-width, and scaling properties. The user agent may use any sampling method.

This property is used to indicate a preference in the scaling/sizing tradeoff to be used when formatting bitmapped graphics.



This is defined as a preference to allow the user agent the flexibility to adapt to device limitations and to accommodate over-constrained situations involving min/max dimensions and scale factors.

**7.15.14. “width”****CSS2 Definition:**

*Value:* <length> | <percentage> | auto | inherit

*Initial:* auto

*Inherited:* no

*Percentages:* refer to width of containing block

*Media:* visual

CSS2 Reference: ["width" property](#)

<http://www.w3.org/TR/REC-CSS2/visudet.html#propdef-width>

This property specifies the content width of boxes generated by block-level and replaced elements.

This property does not apply to non-replaced inline-level elements. The width of a non-replaced inline element's boxes is that of the rendered content within them (before any relative offset of children). Recall that inline boxes flow into line boxes. The width of line boxes is given by their containing block, but may be shorted by the presence of floats.

The width of a replaced element's box is intrinsic and may be scaled by the user agent if the value of this property is different than 'auto'.

Values have the following meanings:

***auto***

The width depends on the values of other properties.

***<length>***

Specifies a fixed width.

***<percentage>***

Specifies a percentage width. The percentage is calculated with respect to the width of the generated box's containing block.

Negative values for "width" are illegal.

*XSL modifications to the CSS definition:*

In XSL, this property is mapped to either "inline-progression-dimension" or "block-progression-dimension", based on the applicable values of the "writing-mode" and "reference-orientation" properties. Details on the mapping are given in § 5 – [Property Refinement / Resolution](#) on page 44.

## 7.16. Block and Line-related Properties

### 7.16.1. “hyphenation-keep”

XSL Definition:

<i>Value:</i>	auto   column   page   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### ***auto***

No restriction applies. The word may be hyphenated at the end of any region.

#### ***column***

Both parts of a hyphenated word shall lie within a single column.

#### ***page***

Both parts of a hyphenated word shall lie within a single page.

Controls whether hyphenation can be performed on the last line that fits in a given reference-area.

### 7.16.2. “hyphenation-ladder-count”

XSL Definition:

<i>Value:</i>	no-limit   <number>   inherit
<i>Initial:</i>	no-limit
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### ***no-limit***

Any number of successive lines may be hyphenated.

#### ***<number>***

An integer greater than or equal to 1.



If a zero, negative, or non-integer value is provided, the value will be rounded to the nearest integer value greater than or equal to 1.

Specifies a limit on the number of successive hyphenated line-areas the formatter may generate in a block-area.

### 7.16.3. “last-line-end-indent”

XSL Definition:

<i>Value:</i>	<length>   <percentage>   inherit
<i>Initial:</i>	Opt
<i>Inherited:</i>	yes
<i>Percentages:</i>	refer to inline-progression-dimension of closest ancestor block-area that is not a line-area
<i>Media:</i>	visual

Values have the following meanings:

#### <length>

The "last-line-end-indent" is specified as a length.

#### <percentage>

The "last-line-end-indent" is specified as a percentage of the inline-progression-dimension of the closest ancestor block-area.

Specifies an indent to be applied to the last line-area child of the last block-area generated and returned by the formatting object, and to any line-area generated by the formatting object whose following sibling is a block-area that is not a line-area. It is added to the block's end-edge. Positive values indent the edge, negative values outdent the edge.

### 7.16.4. “line-height”

CSS2 Definition:

<i>Value:</i>	normal   <length>   <number>   <percentage>   <space>   inherit
<i>Initial:</i>	normal
<i>Inherited:</i>	yes
<i>Percentages:</i>	refer to the font size of the element itself
<i>Media:</i>	visual

CSS2 Reference: ["line-height" property](#)

<http://www.w3.org/TR/REC-CSS2/visudet.html#propdef-line-height>

Values have the following meanings:

#### *normal*

Tells user agents to set the computed value to a "reasonable" value based on the font size of the element. The value has the same meaning as <number>. We recommend a computed value for "normal" between 1.0 to 1.2.

**<length>**

The box height is set to this length. Negative values are illegal.

**<number>**

The computed value of the property is this number multiplied by the element's font size. Negative values are illegal. However, the number, not the computed value, is inherited.

**<percentage>**

The computed value of the property is this percentage multiplied by the element's computed font size. Negative values are illegal.

If the property is set on a block-level element whose content is composed of inline-level elements, it specifies the minimal height of each generated inline box.

If the property is set on an inline-level element, it specifies the exact height of each box generated by the element. (Except for inline replaced elements, where the height of the box is given by the "height" property.)

When an element contains text that is rendered in more than one font, user agents should determine the "line-height" value according to the largest font size.

Generally, when there is only one value of "line-height" for all inline boxes in a paragraph (and no tall images), the above will ensure that baselines of successive lines are exactly "line-height" apart. This is important when columns of text in different fonts have to be aligned, for example in a table.

Note that replaced elements have a "font-size" and a "line-height" property, even if they are not used directly to determine the height of the box. The "font-size" is, however, used to define the "em" and "ex" units, and the "line-height" has a role in the "vertical-align" property.

*XSL modifications to the CSS definition:*

In XSL the "line-height" property is used in determining the *half-leading* trait.

XSL adds the following value with the following meaning:

**<space>**

Specifies the minimum, optimum, and maximum values, the conditionality, and precedence of the "line-height" that is used in determining the *half-leading*.

Negative values for line-height.minimum, line-height.optimum, and line-height.maximum are invalid and will be interpreted as 0pt.

The line-height.conditionality setting can be used to control the half-leading above the first line or after the last line that is placed in a reference-area.

The line-height.precedence setting can be used to control the merging of the half-leading with other spaces.

If line-height is specified using <length>, <percentage>, or <number>, the formatter shall convert the single value to a space-specifier with the subfields interpreted as follows:

- line-height.minimum: the resultant computed value (as a length) of the <length>, <percentage>, or <number>.
- line-height.optimum: the resultant computed value (as a length) of the <length>, <percentage>, or <number>.

- `line-height.maximum`: the resultant computed value (as a length) of the `<length>`, `<percentage>`, or `<number>`.
- `line-height.precedence`: force.
- `line-height.conditionality`: retain

### 7.16.5. “line-height-shift-adjustment”

XSL Definition:

<i>Value:</i>	<code>consider-shifts</code>   <code>disregard-shifts</code>   <code>inherit</code>
<i>Initial:</i>	<code>consider-shifts</code>
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### *consider-shifts*

In determining the line-height, include the adjusted top-edge and bottom-edge of any characters that have a baseline-shift.

#### *disregard-shifts*

In determining the line-height, include the unshifted top-edge and bottom-edge of any characters that have a baseline-shift.

This property is used to control whether the line-height is adjusted for content that has a baseline-shift.



This property can be used to prevent superscript and subscript characters from disrupting the line-spacing.

### 7.16.6. “line-stacking-strategy”

XSL Definition:

<i>Value:</i>	<code>line-height</code>   <code>font-height</code>   <code>max-height</code>   <code>inherit</code>
<i>Initial:</i>	<code>max-height</code>
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### *line-height*

Uses the per-inline-height-rectangle as described in § 4.5 – Line-areas on page 35.



This matches CSS's line-height and positioning strategy.

***font-height***

Uses the nominal-requested-line-rectangle as described in § 4.5 – Line-areas on page 35.

***max-height***

Uses the maximal-line-rectangle as described in § 4.5 – Line-areas on page 35.

Selects the strategy for positioning adjacent lines, relative to each other.

Implementations must support at least the "max-height" and "font-height" values defined in this Recommendation, and may treat "line-height" as if "max-height" had been specified.

**7.16.7. “linefeed-treatment”**

XSL Definition:

<i>Value:</i>	ignore   preserve   treat-as-space   treat-as-zero-width-space   inherit
<i>Initial:</i>	treat-as-space
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***ignore***

Specifies that any character flow object whose Unicode code point is U+000A shall be discarded during the refinement process.

***preserve***

Specifies no special action.

***treat-as-space***

Specifies that any character flow object whose Unicode code point is U+000A (linefeed) shall be converted during the refinement process into a character flow object whose Unicode code point is U+0020 (space).

***treat-as-zero-width-space***

Specifies that any character flow object whose Unicode code point is U+000A shall be converted during the refinement process into a character flow object whose Unicode code point is U+200B (zero width space).



The Unicode Standard recommends that the zero width space is considered a valid line-break point and that if two characters with a zero width space in between are placed on the same line they are placed with no space between them and that if they are placed on two lines no additional glyph area, such as for a hyphen, is created at the line-break.

The "linefeed-treatment" property specifies the treatment of linefeeds (character flow objects whose Unicode code point is U+000A) during the refinement process.

### 7.16.8. “white-space-treatment”

XSL Definition:

<i>Value:</i>	ignore   preserve   ignore-if-before-linefeed   ignore-if-after-linefeed   ignore-if-surrounding-linefeed   inherit
<i>Initial:</i>	ignore-if-surrounding-linefeed
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### *ignore*

Any glyph-area whose Unicode character is classified as white space in XML, except for U+000A, shall be deleted during line-building and inline-building (see § 4.7.2 – [Line-building](#) on page 38 and § 4.7.3 – [Inline-building](#) on page 39).

#### *preserve*

Any glyph-area whose Unicode character is classified as white space in XML shall not be deleted during line-building and inline-building.

#### *ignore-if-before-linefeed*

Any glyph-area with a suppress-at-line-break value of 'suppress' shall be deleted during line-building and inline-building if it would be the last glyph-area descendant of a line-area.

#### *ignore-if-after-linefeed*

Any glyph-area with a suppress-at-line-break value of 'suppress' shall be deleted during line-building and inline-building if it would be the first glyph-area descendant of a line-area.

#### *ignore-if-surrounding-linefeed*

Any glyph-area with a suppress-at-line-break value of 'suppress' shall be deleted during line-building and inline-building if it would be the first or last glyph-area descendant of a line-area.

The "white-space-treatment" property specifies the treatment during line-building and inline-building of glyph areas, except for linefeeds, that are classified as white space in XML. This includes U+0020 (space) and other white space characters but excludes U+000A (linefeed). Linefeed treatment is determined by the "linefeed-treatment" property.

### 7.16.9. “text-align”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x77>

<i>Value:</i>	start   center   end   justify   inside   outside   left   right   <string>   inherit
<i>Initial:</i>	start
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["text-align" property](#)

<http://www.w3.org/TR/REC-CSS2/text.html#propdef-text-align>

This property describes how inline content of a block is aligned. Values have the following meanings:

*left*

*center*

*right*

*justify*

Left, right, center, and justify text, respectively.

<*string*>

Specifies a string on which cells in a table column will align (see the section on horizontal alignment in a column for details and an example). This value applies only to table cells. If set on other elements, it will be treated as 'left' or 'right', depending on whether 'direction' is 'ltr', or 'rtl', respectively.

A block of text is a stack of line boxes. In the case of 'left', 'right' and 'center', this property specifies how the inline boxes within each line box align with respect to the line box's left and right sides; alignment is not with respect to the viewport. In the case of 'justify', the UA may stretch the inline boxes in addition to adjusting their positions. (See also 'letter-spacing' and 'word-spacing'.)



The actual justification algorithm used is user agent and written language dependent.

Conforming user agents may interpret the value 'justify' as 'left' or 'right', depending on whether the element's default writing direction is left-to-right or right-to-left, respectively.

*XSL modifications to the CSS definition:*

Values have the following meanings:

*start*

Specifies that the content is to be aligned on the start-edge in the inline-progression-direction.

*center*

Specifies that the content is to be centered in the inline-progression-direction.

*end*

Specifies that the content is to be aligned on the end-edge in the inline-progression-direction.

*justify*

Specifies that the contents is to be expanded to fill the available width in the inline-progression-direction.

*inside*

If the page binding edge is on the start-edge, the alignment will be start. If the binding is the end-edge, the alignment will be end. If neither, use start alignment.

*outside*

If the page binding edge is on the start-edge, the alignment will be end. If the binding is the end-edge, the alignment will be start. If neither, use end alignment.

***left***

Interpreted as "text-align='start'".

***right***

Interpreted as "text-align='end'".

***<string>***

Specifies a string on which content of cells in a table column will align (see the section, in the CSS2 Recommendation, on horizontal alignment in a column for details and an example). This value applies only if the formatting object is a descendant of a table cell. If set on other formatting objects, it will be treated as "start".

This property describes how inline content of a block is aligned. For fo:external-graphic, fo:instream-foreign-object, and fo:table-and-caption it specifies the alignment of other areas as described in the constraint section for these formatting objects.

**7.16.10. “text-align-last”**

XSL Definition:

<i>Value:</i>	relative   start   center   end   justify   inside   outside   left   right   inherit
<i>Initial:</i>	relative
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***relative***

If text-align is justify, then the alignment of the last line, and of any line ending in U+000A, will be start. If text-align is not justify, text-align-last will use the value of text-align.

***start***

Specifies that the content is to be aligned on the start-edge in the inline-progression-direction.

***center***

Specifies that the contents is to be centered in the inline-progression-direction.

***end***

Specifies that the content is to be aligned on the end-edge in the inline-progression-direction.

***justify***

Specifies that the contents is to be expanded to fill the available width in the inline-progression-direction.

***inside***

If the page binding edge is on the start-edge, the alignment will be start. If the binding is the end-edge, the alignment will be end. If neither, use start-side.

***outside***

If the page binding edge is on the start-edge, the alignment will be end. If the binding is the end-edge the alignment will be start. If neither, use end alignment.

***left***

Interpreted as "text-align-last='start'".

***right***

Interpreted as "text-align-last='end'".

Specifies the alignment of the last line-area child of the last block-area generated and returned by the formatting object, and to any line-area generated by the formatting object whose following sibling is a block-area that is not a line-area, and any lines in the block ending in U+000A.

**7.16.11. “text-indent”**

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x76>

<i>Value:</i>	<length>   <percentage>   inherit
<i>Initial:</i>	0pt
<i>Inherited:</i>	yes
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["text-indent" property](#)

<http://www.w3.org/TR/REC-CSS2/text.html#propdef-text-indent>

This property specifies the indentation of the first line of text in a block. More precisely, it specifies the indentation of the first box that flows into the block's first line box. The box is indented with respect to the left (or right, for right-to-left layout) edge of the line box. User agents should render this indentation as blank space.

Values have the following meanings:

**<length>**

The indentation is a fixed length.

**<percentage>**

The indentation is a percentage of the containing block width

The value of 'text-indent' may be negative, but there may be implementation-specific limits. If the value of 'text-indent' is negative, the value of 'overflow' will affect whether the text is visible.

***XSL modifications to the CSS definition:***

The "text-indent" property specifies an adjustment to the start-indent of the first child *L* of the first block-area generated and returned by the formatting object, provided *L* is a line-area.

A negative value specifies a hanging indent (outdent) on the first line.



### 7.16.12. “white-space-collapse”

XSL Definition:

<i>Value:</i>	false   true   inherit
<i>Initial:</i>	true
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### *false*

Specifies no special action.

#### *true*

Specifies, for any character flow object such that:

- its character is classified as white space in XML, *and*
  - it is *not*, however, a U+000A (linefeed) character, *and*
  - the immediately preceding flow object is a character flow object with a character classified as white space in XML *or* the immediately *following* flow object is a linefeed,
- that flow object shall not generate an area.

The "white-space-collapse" property specifies the treatment of consecutive white space during area tree construction. The overall effect of handling the linefeed-treatment property during refinement and the white-space-collapse and white-space-treatment properties during area tree generation is as follows: after refinement, where some white space characters may have been discarded or turned into space characters, all remaining runs of two or more consecutive spaces are replaced by a single space, then any remaining space immediately adjacent to a remaining linefeed is also discarded.

An implementation is free to use any algorithm to achieve an equivalent effect.

### 7.16.13. “wrap-option”

XSL Definition:

<i>Value:</i>	no-wrap   wrap   inherit
<i>Initial:</i>	wrap
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### *no-wrap*

No line-wrapping will be performed.

In the case when lines are longer than the available width of the content-rectangle, the overflow will be treated in accordance with the "overflow" property specified on the reference-area.

***wrap***

Line-breaking will occur if the line overflows the available block width. No special markers or other treatment will occur.

Specifies how line-wrapping (line-breaking) of the content of the formatting object is to be handled.

Implementations must support the "no-wrap" value, as defined in this Recommendation, when the value of "linefeed-treatment" is "preserve".

**7.17. Character Properties****7.17.1. “character”**

XSL Definition:

<i>Value:</i>	<character>
<i>Initial:</i>	N/A, value is required
<i>Inherited:</i>	no, a value is required
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

<*character*>

Specifies the Unicode character to be presented.

**7.17.2. “letter-spacing”**

CSS2 Definition:

<i>Value:</i>	normal   <length>   <space>   inherit
<i>Initial:</i>	normal
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["letter-spacing" property](#)

<http://www.w3.org/TR/REC-CSS2/text.html#propdef-letter-spacing>

This property specifies spacing behavior between text characters. Values have the following meanings:

***normal***

The spacing is the normal spacing for the current font. This value allows the user agent to alter the space between characters in order to justify text.

**<length>**

This value indicates inter-character space in addition to the default space between characters. Values may be negative, but there may be implementation-specific limits. User agents may not further increase or decrease the inter-character space in order to justify text.

Character-spacing algorithms are user agent dependent. Character spacing may also be influenced by justification (see the "text-align" property).

When the resultant space between two characters is not the same as the default space, user agents should not use ligatures.

Conforming user agents may consider the value of the 'letter-spacing' property to be 'normal'.

*XSL modifications to the CSS definition:*

The following value type has been added for XSL:

**<space>**

This allows the user to specify a range of adjustments in addition to the default space between characters.

The minimum and maximum values specify the limits of the adjustment.

Default space between characters is defined to be Opt, i.e., glyph-areas stacked with no extra space between the allocation-rectangles of the glyph-areas. The *inline-progression-dimension* of the glyph-area is obtained by formatting the fo:character.

For an fo:character that in the Unicode database is classified as "Alphabetic", unless the *treat-as-word-space* trait has the value "true", the *space-start* and *space-end* traits are each set to a value as follows:

- For "normal": .optimum = "the normal spacing for the current font" / 2, .maximum = auto, .minimum = auto, .precedence = force, and .conditionality = discard. A value of auto for a component implies that the limits are User Agent specific.
- For a <length>: .optimum = <length> / 2, .maximum = .optimum, .minimum = .optimum, .precedence = force, and .conditionality = discard.
- For a <space>: a value that is half the value of the "letter-spacing" property for the numeric components and the value for the .precedence and .conditionality components. The initial values for .precedence is "force" and for .conditionality "discard".

The CSS statement that "Conforming user agents may consider the value of the 'letter-spacing' property to be 'normal'." does not apply in XSL, if the User Agent implements the "Extended" property set.



If it is desired that the letter space combine with other spaces that have less than forcing precedence, then the value of the "letter-space" should be specified as a <space> with precedence less than force which implies that space combines according to the space resolution rules described in § 4.3 – Spaces and Conditionality on page 28.

The algorithm for resolving the adjusted values between word spacing and letter spacing is User Agent dependent.

### 7.17.3. “suppress-at-line-break”

XSL Definition:

<i>Value:</i>	auto   suppress   retain   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property applies only to fo:character and determines whether the character's representation shall be suppressed when it would occur adjacent to a line break. Multiple characters may be so suppressed.

This property has the following values:

#### **auto**

The value of this property is determined by the Unicode value of the object's character property. The character at code point U+0020 is treated as if 'suppress' had been specified. All other characters are treated as if 'retain' had been specified.

This value does not automatically suppress the presentation of the non-breaking-space (U+00A0), the fixed spaces (U+2000 through U+200A), or the ideographic-space (U+3000).

#### **suppress**

The glyph area generated by the fo:character is eligible to be suppressed at the start or end of a line-area depending on the white-space-treatment property. (q.v.)

#### **retain**

The glyph area generated by the fo:character shall be placed in the area tree whether or not it first or last in a line-area.

### 7.17.4. “text-decoration”

CSS2 Definition:

<i>Value:</i>	none   [ [ underline   no-underline ]    [ overline   no-overline ]    [ line-through   no-line-through ]    [ blink   no-blink ] ]   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no, but see prose
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["text-decoration" property](#)

<http://www.w3.org/TR/REC-CSS2/text.html#propdef-text-decoration>

This property describes decorations that are added to the text of an element. If the property is specified for a block-level element, it affects all inline-level descendants of the element. If it is specified for (or affects) an inline-level element, it affects all boxes generated by the element. If the element has no content or no text content (e.g., the IMG element in HTML), user agents must ignore this property.

Values have the following meanings:

***none***

Produces no text decoration.

***underline***

Each line of text is underlined.

***overline***

Each line of text has a line above it.

***line-through***

Each line of text has a line through the middle

***blink***

Text blinks (alternates between visible and invisible). Conforming user agents are not required to support this value.

The color(s) required for the text decoration should be derived from the "color" property value.

This property is not inherited, but descendant boxes of a block box should be formatted with the same decoration (e.g., they should all be underlined). The color of decorations should remain the same even if descendant elements have different "color" values.

*XSL modifications to the CSS definition:*

In XSL, the specification of the "underline" value is expanded as follows: The placement of the underline depends on whether the "inline-progression-direction" is oriented horizontally or vertically and on the "language" property. For horizontal text the underline is placed below the text. For vertical text the placement depends on the value of the "language" property: the underline is placed on or close to either the before-edge or the after-edge of the underlined text.



This specification does not specify the dependence of the placement of the vertical underline on the "language". It is possible for two conforming XSL processors to place the underline on different sides of the vertical text. For Japanese, the placement of the underline is typically close to the before-edge of the underlined text. For other languages, such as Chinese, the typical placement is close to the after-edge of the underlined text. Implementers should not make any assumptions about how underlines are placed in particular languages and should properly research the languages that they wish to support.



Some fonts have an attribute that suggests where to place the underline for text in that font. That value is likely to apply only when the "inline-progression-direction" is oriented horizontally.

XSL adds the following values with the following meanings:

***no-underline***

Turns off underlining, if any.

***no-overline***

Turns off overlining, if any.

***no-line-through***

Turns off line-through, if any.

***no-blink***

Turns off blinking, if any.

**7.17.5. “text-shadow”****CSS2 Definition:**

<i>Value:</i>	none   [<color>    <length> <length> <length>? ,]* [<color>    <length> <length> <length>? ]   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no, see prose
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

**CSS2 Reference:** ["text-shadow" property](#)

<http://www.w3.org/TR/REC-CSS2/text.html#propdef-text-shadow>

This property accepts a comma-separated list of shadow effects to be applied to the text of the element. The shadow effects are applied in the order specified and may thus overlay each other, but they will never overlay the text itself. Shadow effects do not alter the size of a box, but may extend beyond its boundaries. The stack level of the shadow effects is the same as for the element itself.

Each shadow effect must specify a shadow offset and may optionally specify a blur radius and a shadow color.


A shadow offset is specified with two "length" values that indicate the distance from the text. The first length value specifies the horizontal distance to the right of the text. A negative horizontal length value places the shadow to the left of the text. The second length value specifies the vertical distance below the text. A negative vertical length value places the shadow above the text.

A blur radius may optionally be specified after the shadow offset. The blur radius is a length value that indicates the boundaries of the blur effect. The exact algorithm for computing the blur effect is not specified.

A color value may optionally be specified before or after the length values of the shadow effect. The color value will be used as the basis for the shadow effect. If no color is specified, the value of the "color" property will be used instead.

***XSL modifications to the CSS definition:***

The "text-shadow" property is not inherited, it is converted into a rendering trait. This rendering trait specifies that a rendering effect is to be applied, collectively, to the glyph images within the area forest returned by the children of the formatting object on which the property is specified. That is, for any given glyph area, the glyph image, the marked portion of that area not including background, is copied, shifted by the shadow offset, then colored and blurred (if so specified) and rendered after any background is rendered and prior to rendering the glyph image itself. The shadow is colored with the color that will be used to color the glyph image itself if no color is specified as part of the shadow effect and with the specified color if a color is specified as part of the shadow effect. If more than one shadow effect is specified that last specified effect is rendered first and preceding effects are rendered in the reverse of the order in which they were specified in the list of shadow effects.

 Since the entire forest of normal areas returned by the formatting object on which the property applies is affected by the rendering effect it appears that the shadow effect is inherited. Inheritance would not work however, because that would not allow all the images of one shadow effect to be rendered prior to all the glyph images or images or shadow effect specified before the given shadow effect.

### 7.17.6. “text-transform”

CSS2 Definition:

*Value:* capitalize | uppercase | lowercase | none | inherit

*Initial:* none

*Inherited:* yes

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["text-transform" property](#)

<http://www.w3.org/TR/REC-CSS2/text.html#propdef-text-transform>

This property controls capitalization effects of an element's text. Values have the following meanings:

***capitalize***

Puts the first character of each word in uppercase.

***uppercase***

Puts all characters of each word in uppercase.

***lowercase***

Puts all characters of each word in lowercase.

***none***

No capitalization effects.

The actual transformation in each case is written language dependent. See [RFC2070] for ways to find the language of an element.

Conforming user agents may consider the value of "text-transform" to be "none" for characters that are not from the ISO Latin-1 repertoire and for elements in languages for which the transformation is different from that specified by the case-conversion tables of Unicode or ISO 10646.

*XSL modifications to the CSS definition:*

There are severe internationalization issues with the use of this property. It has been retained for CSS compatibility, but its use is not recommended in XSL.

### 7.17.7. “treat-as-word-space”

XSL Definition:

*Value:* auto | true | false | inherit

*Initial:* auto

*Inherited:* no

<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property determines if the character shall be treated as a word space or as a normal letter.

This property has the following values:

***auto***

The value of this property is determined by the Unicode code point for the character.

As the default behavior:

- The characters at code points U+0020 and U+00A0 are treated as if 'true' had been specified. All other characters are treated as if 'false' had been specified.
- This property does not automatically apply word spacing to the fixed spaces (U+2000 through U+200A) or the ideographic-space (U+3000).
- This default behavior can be overridden by information in the font used for formatting the character, which can specify additional characters that may be treated as "word spaces".

***true***

This inline-progression-dimension of the character shall be adjusted as described in the "word-spacing" property.

***false***

This character shall not have a word spacing adjustment applied.

### 7.17.8. “word-spacing”

CSS2 Definition:

<i>Value:</i>	normal   <length>   <space>   inherit
<i>Initial:</i>	normal
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["word-spacing" property](#)

<http://www.w3.org/TR/REC-CSS2/text.html#propdef-word-spacing>

This property specifies spacing behavior between words. Values have the following meanings:

***normal***

The normal inter-word space, as defined by the current font and/or the UA.

**<length>**

This value indicates inter-word space in addition to the default space between words. Values may be negative, but there may be implementation-specific limits.

Word spacing algorithms are user agent-dependent. Word spacing is also influenced by justification (see the 'text-align' property).



*XSL modifications to the CSS definition:*

The following value type has been added for XSL:

**<space>**

This allows the user to specify a range of adjustments in addition to the default space between words.

The minimum and maximum values specify the limits of the adjustment.

Default space between words is defined to be the *inline-progression-dimension* of the glyph-area obtained by formatting the current fo:character whose *treat-as-word-space* trait has the value "true".

For fo:character whose *treat-as-word-space* trait has the value "true", the *space-start* and *space-end* traits are each set to a value as follows:

- For "normal": .optimum = ("the normal inter-word space, as defined by the current font and/or the UA" - "the inline-progression-dimension of the glyph-area obtained by formatting the fo:character") / 2, .maximum = .optimum, .minimum = .optimum, .precedence = force, and .conditionality = discard.
- For a <length>: .optimum = <length> / 2, .maximum = .optimum, .minimum = .optimum, .precedence = force, and .conditionality = discard.
- For a <space>: a value that is half the value of the "word-spacing" property for the numeric components and the value for the .precedence and .conditionality components. The initial values for .precedence is "force" and for .conditionality "discard".



If it is desired that the word space combine with other spaces that have less than forcing precedence, then the value of the word space should be specified as a <space> with precedence less than force which implies that space combines according to the space resolution rules described in § 4.3 – Spaces and Conditionality on page 28.

The algorithm for resolving the adjusted values between word spacing and letter spacing is User Agent dependent.



The "word-spacing" property only affects the placement of glyphs and not the shape that may be associated with the characters. For example, adjusting a "\_" treated as a word space does not lengthen or shorten the "\_" glyph.

## 7.18. Color-related Properties

### 7.18.1. "color"

CSS2 Definition:

<i>Value:</i>	<color>   inherit
<i>Initial:</i>	depends on user agent
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["color" property](#)

<http://www.w3.org/TR/REC-CSS2/colors.html#propdef-color>

**<color>**

Any valid color specification.

This property describes the foreground color of an element's text content.

*XSL modifications to the CSS definition:*

XSL adds an "rgb-icc" function (see § 5.10.2 – Color Functions on page 65) as a valid value of this property.

**7.18.2. “color-profile-name”**

XSL Definition:

<i>Value:</i>	<name>   inherit
<i>Initial:</i>	N/A, value is required
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

**<name>**

Specifies the name of a color-profile for internal references.

**7.18.3. “rendering-intent”**

XSL Definition:

<i>Value:</i>	auto   perceptual   relative-colorimetric   saturation   absolute-colorimetric   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

"rendering-intent" permits the specification of a color-profile rendering-intent other than the default. "rendering-intent" is applicable primarily to color-profiles corresponding to CMYK color spaces. The different options cause different methods to be used for translating colors to the color gamut of the target rendering device.

Values have the following meanings:

***auto***

This is the default behavior. The User Agent determines the best intent based on the content type. For image content containing an embedded profile, it shall be assumed that the intent specified within the profile is the desired intent. Otherwise, the user agent shall use the current profile and force the intent, overriding any intent that might be stored in the profile itself.

***perceptual***

This method, often the preferred choice for images, preserves the relationship between colors. It attempts to maintain relative color values among the pixels as they are mapped to the target

device gamut. Sometimes pixel values that were originally within the target device gamut are changed in order to avoid hue shifts and discontinuities and to preserve as much as possible the overall appearance of the scene.

### *relative-colorimetric*

Leaves colors that fall inside the gamut unchanged. This method usually converts out of gamut colors to colors that have the same lightness but fall just inside the gamut.

### *saturation*

Preserves the relative saturation (chroma) values of the original pixels. Out of gamut colors are converted to colors that have the same saturation but fall just inside the gamut.

### *absolute-colorimetric*

Disables white point matching when converting colors. This option is generally not recommended.

## 7.19. Float-related Properties

### 7.19.1. “clear”

CSS2 Definition:

<i>Value:</i>	start   end   left   right   inside   outside   both   none   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["clear" property](#)

<http://www.w3.org/TR/REC-CSS2/visuren.html#propdef-clear>

This property indicates which sides of an element's box(es) may not be adjacent to an earlier floating box. (It may be that the element itself has floating descendants; the 'clear' property has no effect on those.)

This property may only be specified for block-level elements (including floats). For compact and run-in boxes, this property applies to the final block box to which the compact or run-in box belongs.

Values have the following meanings when applied to non-floating block boxes:

#### *left*

The top margin of the generated box is increased enough that the top border edge is below the bottom outer edge of any left-floating boxes that resulted from elements earlier in the source document.

#### *right*

The top margin of the generated box is increased enough that the top border edge is below the bottom outer edge of any right-floating boxes that resulted from elements earlier in the source document.

***both***

The generated box is moved below all floating boxes of earlier elements in the source document.

***none***

No constraint on the box's position with respect to floats.

When the property is set on floating elements, it results in a modification of the rules for positioning the float. An extra constraint (#10) is added [to those specified in the description of the 'float' property]:

10. The top outer edge of the float must be below the bottom outer edge of all earlier left-floating boxes (in the case of 'clear: left'), or all earlier right-floating boxes (in the case of 'clear: right'), or both ('clear: both').

*XSL modifications to the CSS definition:*

A start-float is defined to mean an area with area-class "xsl-side-float" that was generated by an fo:float with property "float" specified as "left" or "start".

An end-float is defined to mean an area with area-class "xsl-side-float" that was generated by an fo:float with property "float" specified as "right" or "end".

An inside-float is defined to mean an area with area-class "xsl-side-float" that was generated by an fo:float with property "float" specified as "inside".

An outside-float is defined to mean an area with area-class "xsl-side-float" that was generated by an fo:float with property "float" specified as "outside".

A side-float is defined to mean either a start-float or an end-float.

An area is defined to "clear" a side-float if the before-edge of the area's border-rectangle is positioned to be after the after-edge of the float, or if the area is not a descendant of the side-float's parent reference-area.

A block-level formatting object is defined "to clear" a side-float if the areas generated by the formatting object clear the side-float.

In XSL this property applies to block-level formatting objects and fo:float.

The clear property when applied to an fo:float that generates side-floats does not apply to the fo:float's anchor-area.

Values have the following meanings:

***start***

Specifies that each area generated by the formatting object must clear every start-float whose parent reference-area is the nearest ancestor reference-area of the generated area, provided the start-float was generated by an fo:float that is before this formatting object, using pre-order traversal order of the formatting tree. Additionally specifies that each area generated by the formatting object must be placed so that the reference-area chain containing the generated area's nearest ancestor reference-area does not contain a later reference-area that is the parent of a start-float generated by an fo:float that is before this formatting object, using pre-order traversal of the formatting tree.

***end***

Specifies that each area generated by the formatting object must clear every end-float whose parent reference-area is the nearest ancestor reference-area of the generated area, provided the end-float was generated by an fo:float that is before this formatting object, using pre-order traversal order of the formatting tree. Additionally specifies that each area generated by the formatting object must be placed so that the reference-area chain containing the generated area's nearest ancestor reference-area does not contain a later reference-area that is the parent of an end-float generated by an fo:float that is before this formatting object, using pre-order traversal of the formatting tree.

***left***

Interpreted as "clear='start'".

***right***

Interpreted as "clear='end'".

***inside***

Specifies that each area generated by the formatting object must clear every inside-float whose parent reference-area is the nearest ancestor reference-area of the generated area, provided the inside-float was generated by an fo:float that is before this formatting object, using pre-order traversal order of the formatting tree. Additionally specifies that each area generated by the formatting object must be placed so that the reference-area chain containing the generated area's nearest ancestor reference-area does not contain a later reference-area that is the parent of an inside-float generated by an fo:float that is before this formatting object, using pre-order traversal of the formatting tree.

***outside***

Specifies that each area generated by the formatting object must clear every outside-float whose parent reference-area is the nearest ancestor reference-area of the generated area, provided the outside-float was generated by an fo:float that is before this formatting object, using pre-order traversal order of the formatting tree. Additionally specifies that each area generated by the formatting object must be placed so that the reference-area chain containing the generated area's nearest ancestor reference-area does not contain a later reference-area that is the parent of an outside-float generated by an fo:float that is before this formatting object, using pre-order traversal of the formatting tree.

***both***


Specifies that each area generated by the formatting object must clear every side-float whose parent reference-area is the nearest ancestor reference-area of the generated area, provided the side-float was generated by an fo:float that is before this formatting object, using pre-order traversal order of the formatting tree. Additionally specifies that each area generated by the formatting object must be placed so that the reference-area chain containing the generated area's nearest ancestor reference-area does not contain a later reference-area that is the parent of a side-float generated by an fo:float that is before this formatting object, using pre-order traversal of the formatting tree.

***none***

This property does not impose any constraints.

When a block-level formatting object is constrained by the "clear" property, its space-before property component values may be altered as necessary for each area that it generates, in order to meet the con-

straint. The alterations are constrained to produce the minimum additional space required to meet the constraint of the "clear" property.

 Depending on how near a side-float's after-edge is to the after-edge of its parent reference-area, a block-level formatting object may not be able to generate an area that is a descendant of the side-float's parent reference-area. In this case the first block-area generated by the formatting object must be placed in one of the following reference-areas in the reference-area chain that contains the side-float's parent reference-area.

### 7.19.2. "float"

CSS2 Definition:

<i>Value:</i>	before   start   end   left   right   inside   outside   none   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["float" property](#)

<http://www.w3.org/TR/REC-CSS2/visuren.html#propdef-float>

This property specifies whether a box should float to the left, right, or not at all. It may be set for elements that generate boxes that are not absolutely positioned. Values have the following meanings:

#### *left*

The element generates a block box that is floated to the left. Content flows on the right side of the box, starting at the top (subject to the "clear" property). The "display" is ignored, unless it has the value "none".

#### *right*

Same as "left", but content flows on the left side of the box, starting at the top.

#### *none*

The box is not floated.

Here are the precise rules that govern the behavior of floats:

1. The left outer edge of a left-floating box may not be to the left of the left edge of its containing block. An analogous rule holds for right-floating elements.
2. If the current box is left-floating, and there are any left floating boxes generated by elements earlier in the source document, then for each such earlier box, either the left outer edge of the current box must be to the right of the right outer edge of the earlier box, or its top must be lower than the bottom of the earlier box. Analogous rules hold for right-floating boxes.
3. The right outer edge of a left-floating box may not be to the right of the left outer edge of any right-floating box that is to the right of it. Analogous rules hold for right-floating elements.
4. A floating box's outer top may not be higher than the top of its containing block.
5. The outer top of a floating box may not be higher than the outer top of any block or floated box generated by an element earlier in the source document.

6. The outer top of an element's floating box may not be higher than the top of any line-box containing a box generated by an element earlier in the source document.
7. A left-floating box that has another left-floating box to its left may not have its right outer edge to the right of its containing block's right edge. (Loosely: a left float may not stick out at the right edge, unless it is already as far to the left as possible.) An analogous rule holds for right-floating elements.
8. A floating box must be placed as high as possible.
9. A left-floating box must be put as far to the left as possible, a right-floating box as far to the right as possible. A higher position is preferred over one that is further to the left/right.

*XSL modifications to the CSS definition:*

The following values have been added for XSL: "before", "start", "end", "inside", and "outside".

In XSL this property applies only to fo:float

Values have the following meanings:

***before***

Specifies that the block-areas generated by the fo:float shall be with area-class "xsl-before-float", and shall be descendants of a before-float-reference-area generated by a conditional sub-region of a region-body.

***start***

Specifies that the block-areas generated by the fo:float shall be with area-class "xsl-side-float" and shall be floated toward the start-edge of the reference area.

***end***

Specifies that the block-areas returned by the fo:float shall be with area-class "xsl-side-float" and shall be floated toward the end-edge of the reference area.

***left***

Interpreted as "float='start'".

***right***

Interpreted as "float='end'".

***inside***

Specifies that the block-areas returned by the fo:float shall be with area-class "xsl-side-float" and shall be floated toward an edge determined by the page binding edge. If the page binding edge is on the start-edge, it shall be floated toward the start-edge of the reference area. If the binding is the end-edge, it shall be floated toward the end-edge of the reference area. If neither, it shall be floated toward the start-edge of the reference area.

***outside***

Specifies that the block-areas returned by the fo:float shall be with area-class "xsl-side-float" and shall be floated toward an edge determined by the page binding edge. If the page binding edge is on the start-edge, it shall be floated toward the end-edge of the reference area. If the binding is the end-edge, it shall be floated toward the start-edge of the reference area. If neither, it shall be floated toward the end-edge of the reference area.

***none***

Specifies that the block-areas generated by the fo:float shall be normal.

This property determines the *area-class* trait of the block-areas returned by the fo:float, which controls the placement and parent of these block-areas.

**7.19.3. “intrusion-displace”**

XSL Definition:

<i>Value:</i>	auto   none   line   indent   block   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***auto***

For a reference-area, this value is treated as if "block" had been specified. For any other area, this value is treated as if "line" had been specified.

***none***

Neither line areas nor block areas are displaced (nor have any adjustment to their inline progression dimension) due to the intrusion of the float. The float overlays the area without affecting any of the content of the area, unless the "clear" property has a specified value other than "none".

***line***

The start and end edges of line areas are displaced just enough so that any intrusions no longer intersects the content rectangle of the line area. For the purposes of this test, the allocation rectangle of the intrusion is used in the intersection. Also, such intersections are done with respect to the line area prior to its adjustment of any "text-indent". This will cause a reduction in the inline progression dimension of the line area.



This is the behavior of floats described in CSS2.

***indent***

The start edge (and end edge) of each line within the block area on which the property occurs is displaced (a) by at least the same amount it would be displaced by the "line" value of this property and (b) in addition, by an amount that preserves the relative offset of that start edge (or end edge) with respect to the start edge (or end edge) of any other line displaced by any intrusion that cause the current line to be displaced. If there is more than one intrusion that could cause a displacement of the line, the largest such displacement is used.


***block***

The start edge (and end edge) of the block is displaced by the least amount necessary to insure that (a) the start edge (end edge) of the block does not intersect any of the start intrusions (end intrusions) that overlap that block and (b) the amount by which it is displaced is at least as much as the displacement of the parent area, provided the parent is a block-area which is not a refer-



ence-area. An intrusion is said to overlap a block if there is a line parallel to the inline progression direction that intersects the allocation rectangles of both the block and the intrusion.

This property determines the displacement strategy in the presence of intrusions.

 Displacing the start edge (and/or end edge) of a block, necessarily displaces the start edge (and/or end edge) of all lines and blocks contained within that block.

## 7.20. Keeps and Breaks Properties

Page breaks only apply to descendants of the fo:flow formatting object, and not within absolutely positioned areas, or out-of-line areas. In descendants of fo:flow formatting objects, column breaks apply, and a column break in the last (or only) column implies a page break; column breaks in static-content apply except for those in the last (or only) column, which are ignored.

The semantics of keeps and breaks are further described in § 4.8 – Keeps and Breaks on page 40.

### 7.20.1. “break-after”


XSL Definition:

<i>Value:</i>	auto   column   page   even-page   odd-page   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values for these properties have the following meanings:

#### *auto*

No break shall be forced.

 Page breaks may occur as determined by the formatter's processing as affected by the "widow", "orphan", "keep-with-next", "keep-with-previous", and "keep-together" properties.

#### *column*

Imposes a break-after condition with a context consisting of column-areas.

#### *page*

Imposes a break-after condition with a context consisting of page-areas.

#### *even-page*

Imposes a break-after condition with a context consisting of even page-areas (a blank page may be generated if necessary).

#### *odd-page*

Imposes a break-after condition with a context consisting of odd page-areas (a blank page may be generated if necessary).

Specifies that the first normal area generated by formatting the next formatting object, if any, shall be the first one placed in a particular context (e.g. page-area, column-area)

This property has no effect when it appears on an fo:table-row formatting object in which there is any row spanning occurring that includes both the current fo:table-row and the subsequent one.

### 7.20.2. “break-before”

XSL Definition:

<i>Value:</i>	auto   column   page   even-page   odd-page   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### **auto**

No break shall be forced.



Page breaks may occur as determined by the formatter's processing as affected by the "widow", "orphan", "keep-with-next", "keep-with-previous", and "keep-together" properties.

#### **column**

Imposes a break-before condition with a context consisting of column-areas.

#### **page**

Imposes a break-before condition with a context consisting of page-areas.

#### **even-page**

Imposes a break-before condition with a context consisting of even page-areas (a blank page may be generated if necessary).

#### **odd-page**

Imposes a break-before condition with a context consisting of odd page-areas (a blank page may be generated if necessary).

Specifies that the first area generated by formatting this formatting object shall be the first one placed in a particular context (e.g., page-area, column-area).

This property has no effect when it appears on an fo:table-row formatting object in which there is any row spanning occurring that includes both the current fo:table-row and the previous one.

### 7.20.3. “keep-together”

XSL Definition:

<i>Value:</i>	<keep>   inherit
<i>Initial:</i>	.within-line=auto, .within-column=auto, .within-page=auto
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property imposes keep-together conditions on formatting objects.

The `<keep>` datatype is composed of three components: within-line, within-column, and within-page. Different components apply to different classes of formatting objects and provide keep conditions relative to different contexts. In the case of the within-line component, the keep context consists of line-areas; for the within-column component, the keep context consists of column-areas; for the within-page component, the keep context consists of page-areas. In the descriptions below, the term "appropriate context" should be interpreted in terms of the previous sentence.

Values of the components have the following meanings:

***auto***

There are no keep-together conditions imposed by this property.

***always***

Imposes a keep-together condition with strength "always" in the appropriate context.

***<integer>***

Imposes a keep-together condition with strength of the given `<integer>` in the appropriate context.

The semantics of keeps and breaks are further described in [§ 4.8 – Keeps and Breaks](#) on page 40.

#### 7.20.4. “keep-with-next”

XSL Definition:

<i>Value:</i>	<code>&lt;keep&gt;</code>   inherit
<i>Initial:</i>	<code>.within-line=auto, .within-column=auto, .within-page=auto</code>
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property imposes keep-with-next conditions on formatting objects.

The `<keep>` datatype is composed of three components: within-line, within-column, and within-page. Different components apply to different classes of formatting objects and provide keep conditions relative to different contexts. In the case of the within-line component, the keep context consists of line-areas; for the within-column component, the keep context consists of column-areas; for the within-page component, the keep context consists of page-areas. In the descriptions below, the term "appropriate context" should be interpreted in terms of the previous sentence.

Values of the components have the following meanings:

***auto***

There are no keep-with-next conditions imposed by this property.

***always***

Imposes a keep-with-next condition with strength "always" in the appropriate context.

***<integer>***

Imposes a keep-with-next condition with strength of the given `<integer>` in the appropriate context.

The semantics of keeps and breaks are further described in § 4.8 – [Keeps and Breaks](#) on page 40.

### 7.20.5. “keep-with-previous”

XSL Definition:

<i>Value:</i>	<keep>   inherit
<i>Initial:</i>	.within-line=auto, .within-column=auto, .within-page=auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property imposes keep-with-previous conditions on formatting objects.

The <keep> datatype is composed of three components: within-line, within-column, and within-page. Different components apply to different classes of formatting objects and provide keep conditions relative to different contexts. In the case of the within-line component, the keep context consists of line-areas; for the within-column component, the keep context consists of column-areas; for the within-page component, the keep context consists of page-areas. In the descriptions below, the term "appropriate context" should be interpreted in terms of the previous sentence.

Values of the components have the following meanings:

#### *auto*

There are no keep-with-previous conditions imposed by this property.

#### *always*

Imposes a keep-with-previous condition with strength "always" in the appropriate context.

#### <*integer*>

Imposes a keep-with-previous condition with strength of the given <integer> in the appropriate context.

The semantics of keeps and breaks are further described in § 4.8 – [Keeps and Breaks](#) on page 40.

### 7.20.6. “orphans”

CSS2 Definition:

<i>Value:</i>	<integer>   inherit
<i>Initial:</i>	2
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["orphans" property](#)

<http://www.w3.org/TR/REC-CSS2/page.html#propdef-orphans>

See definition of property widows (§ 7.20.7 – “widows” on page 347).

### 7.20.7. “widows”

CSS2 Definition:

<i>Value:</i>	<integer>   inherit
<i>Initial:</i>	2
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["widows" property](#)

<http://www.w3.org/TR/REC-CSS2/page.html#propdef-widows>

The "orphans" property specifies the minimum number of lines of a paragraph that must be left at the bottom of a page. The "widows" property specifies the minimum number of lines of a paragraph that must be left at the top of a page.

*XSL modifications to the CSS definition:*

In XSL the "orphans" property specifies the minimum number of line-areas in the first area generated by the formatting object. The "widows" property specifies the minimum number of line-areas in the last area generated by the formatting object.

## 7.21. Layout-related Properties

The following are layout-related properties that are not common to all formatting objects.

### 7.21.1. “clip”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x68>

<i>Value:</i>	<shape>   auto   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["clip" property](#)

<http://www.w3.org/TR/REC-CSS2/visufx.html#propdef-clip>

The 'clip' property applies to elements that have a 'overflow' property with a value other than 'visible'. Values have the following meanings:

**auto**

The clipping region has the same size and location as the element's box(es).

**<shape>**

In CSS2, the only valid <shape> value is: rect (<top>, <right>, <bottom>, <left>) where <top>, <bottom>, <right>, and <left> specify offsets from the respective sides of the box.

<top>, <right>, <bottom>, and <left> may either have a <length> value or "auto". Negative lengths are permitted. The value "auto" means that a given edge of the clipping region will be the same as the edge of the element's generated box (i.e., "auto" means the same as "0".)

When coordinates are rounded to pixel coordinates, care should be taken that no pixels remain visible when <left> + <right> is equal to the element's width (or <top> + <bottom> equals the element's height), and conversely that no pixels remain hidden when these values are 0.

The element's ancestors may also have clipping regions (in case their "overflow" property is not "visible"); what is rendered is the intersection of the various clipping regions.

If the clipping region exceeds the bounds of the UA's document window, content may be clipped to that window by the native operating environment.

**7.21.2. "overflow"**

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x67>

<i>Value:</i>	visible   hidden   scroll   error-if-overflow   repeat   auto   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["overflow" property](#)

<http://www.w3.org/TR/REC-CSS2/visufx.html#propdef-overflow>

This property specifies whether the content of a block-level element is clipped when it overflows the element's box (which is acting as a containing block for the content). Values have the following meanings:

***visible***

This value indicates that content is not clipped, i.e., it may be rendered outside the block box.

***hidden***

This value indicates that the content is clipped and that no scrolling mechanism should be provided to view the content outside the clipping region; users will not have access to clipped content. The size and shape of the clipping region is specified by the "clip" property.

***scroll***

This value indicates that the content is clipped and that if the user agent uses a scrolling mechanism that is visible on the screen (such as a scroll bar or a panner), that mechanism should be displayed for a box whether or not any of its content is clipped. This avoids any problem with

scrollbars appearing and disappearing in a dynamic environment. When this value is specified and the target medium is "print", overflowing content should be printed.

**auto**

The behavior of the "auto" value is user agent dependent, but should cause a scrolling mechanism to be provided for overflowing boxes.

Even if "overflow" is set to "visible", content may be clipped to a UA's document window by the native operating environment.

*XSL modifications to the CSS definition:*

Two more value are defined as follows:

**error-if-overflow**

This value implies the same semantics as the value "hidden" with the additional semantic that an error shall be indicated; implementations may recover by clipping the region.

**repeat**

On a formatting object which generates and returns normal viewport/reference pairs, this value specifies that additional viewport/reference pairs are to be generated so that the reference-area component of each pair is no larger than its parent viewport-area. On other formatting objects (including formatting objects whose absolute-position trait is "absolute" or "fixed"), it acts as if an overflow value of "auto" were specified.

For print media, implementations must support "auto" and "visible", as defined in this Recommendation. Other values may be treated as if "auto" had been specified.

**7.21.3. “reference-orientation”**

XSL Definition:

*Value:* 0 | 90 | 180 | 270 | -90 | -180 | -270 | inherit

*Initial:* 0

*Inherited:* no

*Percentages:* N/A

*Media:* visual

Values have the following meanings:

**0**

The reference-orientation of this reference-area has the same reference-orientation as the containing reference-area.

**90**

The reference-orientation of this reference-area is rotated 90 degrees counter-clockwise from the reference-orientation of the containing reference-area.

**180**


The reference-orientation of this reference-area is rotated 180 degrees counter-clockwise from the reference-orientation of the containing reference-area.

**270**

The reference-orientation of this reference-area is rotated 270 degrees counter-clockwise from the reference-orientation of the containing reference-area.


**-90**

The reference-orientation of this reference-area is rotated 270 degrees counter-clockwise from the reference-orientation of the containing reference-area.

 This is equivalent to specifying "270".


**-180**

The reference-orientation of this reference-area is rotated 180 degrees counter-clockwise from the reference-orientation of the containing reference-area.

 This is equivalent to specifying "180".

**-270**

The reference-orientation of this reference-area is rotated 90 degrees counter-clockwise from the reference-orientation of the containing reference-area.

 This is equivalent to specifying "90".

The reference-orientation specifies the direction for "top" for the content-rectangle of the "reference-area". This is used as the reference for deriving directions, such as the block-progression-direction, inline-progression-direction, etc. as specified by the "writing-mode" and "direction" properties, and the orientation, placement, and tiling of the background.

The "reference-orientation" property is applied only on formatting objects that establish a reference-area. Each value of "reference-orientation" sets the absolute direction for "top", "left", "bottom", and "right"; which is used by "writing-mode", "direction", and all positioning operations that are referenced to the reference-area or are nested within it.

The *reference-orientation* trait on an area is indirectly derived from the "reference-orientation" property on the formatting object that generates the area or the formatting object ancestors of that formatting object.

**7.21.4. "span"**

XSL Definition:

<i>Value:</i>	none   all   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual



Values have the following meanings:

***none***

This object does not span multiple columns.

***all***

The areas resulting from this flow object shall span all the columns of a multi-column region.

Specifies if a block-level object should be placed in the current column or should span all columns of a multi-column region.



This only has effect on areas returned by a flow; e.g. block-areas generated by fo:block children of an fo:flow. Children and further descendants of these areas take on the spanning characteristic of their parent.

## 7.22. Leader and Rule Properties

### 7.22.1. “leader-alignment”

XSL Definition:

<i>Value:</i>	none   reference-area   page   inherit
<i>Initial:</i>	none
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***none***

Leader-pattern has no special alignment.

***reference-area***

Leader-pattern is aligned as if it began on the current reference-area's content-rectangle start-edge.

***page***

Leader-pattern is aligned as if it began on the current page's start-edge.

Specifies whether fo:leaders having identical content and property values shall have their patterns aligned with each other, with respect to their common reference-area or page.

For fo:leaders where the "leader-pattern" property is specified as "dot" or as "use-content", this property will be honored.

If the fo:leader is aligned, the start-edge of each cycle of the repeated pattern will be placed on the start-edge of the next cycle in the appropriate pattern-alignment grid.

### 7.22.2. “leader-pattern”

XSL Definition:

<i>Value:</i>	space   rule   dots   use-content   inherit
<i>Initial:</i>	space

<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***space***

Leader is to be filled with blank space.

***rule***

Leader is to be filled with a rule.

If this choice is selected, the "rule-thickness" and "rule-style" properties are used to set the leader's style.

***dots***

Leader is to be filled with a repeating sequence of dots. The choice of dot character is dependent on the user agent.

***use-content***

Leader is to be filled with a repeating pattern as specified by the children of the fo:leader.

Provides the specification of how to fill in the leader.

If the leader is aligned, the start-edge of each cycle of each repeating pattern component will be placed on the start-edge of the next cycle in the pattern-alignment grid.

Implementations must support the "space", "rule", and "dots" values, as defined in this Recommendation. The "use-content" value may be treated as if "space" had been specified.

### 7.22.3. "leader-pattern-width"

XSL Definition:

<i>Value:</i>	use-font-metrics   <length>   <percentage>   inherit
<i>Initial:</i>	use-font-metrics
<i>Inherited:</i>	yes
<i>Percentages:</i>	refer to the inline-progression-dimension of content-rectangle of parent area
<i>Media:</i>	visual

Values have the following meanings:

***use-font-metrics***

Use the width of the leader-pattern as determined from its font metrics.

**<length>**

Sets length for leader-pattern-repeating.

The leader will have an inline-space inserted after each pattern cycle to account for any difference between the width of the pattern as determined by the font metrics and the width specified in this property.

If the length specified is less than the value that would be determined via the use-font-metrics choice, the value of this property is computed as if use-font-metrics choice had been specified.

Specifies the length of each repeat cycle in a repeating leader.

For leaders where the "leader-pattern" property is specified as "dots" or as "use-content", this property will be honored.

#### 7.22.4. “leader-length”

XSL Definition:

<i>Value:</i>	<length-range>   <percentage>   inherit
<i>Initial:</i>	leader-length.minimum=0pt, .optimum=12.0pt, .maximum=100%
<i>Inherited:</i>	yes
<i>Percentages:</i>	refer to the inline-progression-dimension of content-rectangle of parent area
<i>Media:</i>	visual

Values have the following meanings:

##### <length-range>

leader-length.minimum=sets minimum length for a leader

leader-length.optimum=sets optimum length for a leader

leader-length.maximum=sets maximum length for a leader

Specifies the minimum, optimum, and maximum length of an fo:leader.

This property constrains the length of the leader to be between the minimum and maximum lengths.



User agents may choose to use the value of "leader-length.optimum" to determine where to break the line, then use the minimum and maximum values during line justification.

Leader length values such as:

```
leader-length.minimum="0pt"
leader-length.optimum="12pt"
leader-length.maximum="100%"
```

would specify constraints that would cause the leader to fill all available space within the current line area as part of the process of justifying that line area.



As with all other space and formatting objects within a line area whose inline-progression-dimension provides minimum/optimum/maximum constraints, a leader formatting object's length-range provides further flexibility to the justification process. Though any result that satisfies the specified constraints would conform to this specification, current typographic practice would tend to make use of leader length flexibility in preference to other flexibility (e.g. word spaces) within the same line area when justifying the line. If multiple leader formatting objects occur within the same line area, current typographic practice would tend to make use of the length flexibility of all of them in some implementation defined manner (e.g. equally or proportionally to the specified leader-length.maximum values).

#### 7.22.5. “rule-style”

XSL Definition:

<i>Value:</i>	none   dotted   dashed   solid   double   groove   ridge   inherit
<i>Initial:</i>	solid

<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the style (pattern) of the rule.

This property applies only if the "leader-pattern" property is specified as "rule".

Values have the following meanings:

***none***

No rule, forces rule-thickness to 0.

***dotted***

The rule is a series of dots.

***dashed***

The rule is a series of short line segments.

***solid***

The rule is a single line segment.

***double***

The rule is two solid lines. The sum of the two lines and the space between them equals the value of "rule-thickness".

***groove***

The rule looks as though it were carved into the canvas. (Top/left half of the rule's thickness is the color specified; the other half is white.)

***ridge***

The opposite of "groove", the rule looks as though it were coming out of the canvas. (Bottom/right half of the rule's thickness is the color specified; the other half is white.)

Implementations must support the "none" and "solid" values, as defined in this Recommendation. Other values may be treated as if "solid" had been specified.

### 7.22.6. "rule-thickness"

XSL Definition:

<i>Value:</i>	<length>
<i>Initial:</i>	1.0pt
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the overall thickness of the rule.

This property applies only if the "leader-pattern" property is specified as "rule".

Values have the following meanings:

**<length>**

The "rule-thickness" is always perpendicular to its length-axis.

The rule is thickened equally above and below the line's alignment position. This can be adjusted through the "baseline-shift" property.

## 7.23. Properties for Dynamic Effects Formatting Objects

### 7.23.1. "active-state"

XSL Definition:

<i>Value:</i>	link   visited   active   hover   focus
<i>Initial:</i>	no, a value is required
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

Values have the following meanings:

***link***

This fo:multi-property-set applies if there is an fo:basic-link descendant of the parent fo:multi-properties and that link has not yet been visited.

***visited***

This fo:multi-property-set applies if there is an fo:basic-link descendant of the parent fo:multi-properties and that link has been visited.

***active***

This fo:multi-property-set applies while a normal area returned by the parent fo:multi-properties is being activated by the user. For example, between the times the user presses the mouse button and releases it.

***hover***

This fo:multi-property-set applies while the user designates a normal area returned by the parent fo:multi-properties (with some pointing device), but does not activate it. For example the cursor (mouse pointer) hovers over such an area.

***focus***

This fo:multi-property-set applies while a normal area returned by the parent fo:multi-properties has the focus (accepts keyboard events or other forms of text input).

The "active-state" property is used to control which of the fo:multi-property-sets are used to format the child flow objects within an fo:multi-properties formatting object. The states (or at least the events that cause the state to be entered) are defined by the DOM.

### 7.23.2. “auto-restore”

XSL Definition:

<i>Value:</i>	true   false
<i>Initial:</i>	false
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

Values have the following meanings:

#### *true*

If this fo:multi-switch is contained in another fo:multi-switch, and that fo:multi-switch changes the active fo:multi-case (hiding this fo:multi-switch), then this fo:multi-switch should restore its initial fo:multi-case.

#### *false*

This fo:multi-switch should retain its current fo:multi-case.

Specifies if the initial fo:multi-case should be restored when the fo:multi-switch gets hidden by an ancestor fo:multi-switch.



A common case of using this property with a "true" value is when several nested fo:multi-switch objects build an expandable/collapsible table-of-contents view. If the table-of-contents is expanded far down the hierarchy, and an (far above) ancestor is closed, one would want all subtitles to have restored to their original state when that ancestor is opened again.

### 7.23.3. “case-name”

XSL Definition:

<i>Value:</i>	<name>
<i>Initial:</i>	none, a value is required
<i>Inherited:</i>	no, a value is required
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

#### *<name>*

Specifies a name for an fo:multi-case. The name must be unique among the current fo:multi-case siblings, i.e., in the scope of the fo:multi-switch object that (directly) contains them. Other instances of fo:multi-switch objects may use the same names for its fo:multi-case objects.

The purpose of this property is to allow fo:multi-toggle objects to select fo:multi-case objects to switch to.

### 7.23.4. “case-title”

XSL Definition:

<i>Value:</i>	<string>
---------------	----------

<i>Initial:</i>	none, a value is required
<i>Inherited:</i>	no, a value is required
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

**<string>**

Specifies a descriptive title for the fo:multi-case. The title can be displayed in a menu to represent this fo:multi-case when an fo:multi-toggle object names several fo:multi-case objects as allowed destinations.

**7.23.5. “destination-placement-offset”**

XSL Definition:

<i>Value:</i>	<length>
<i>Initial:</i>	Opt
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

**<length>**

The "destination-placement-offset" property specifies the distance from the beginning (top) of the page to the innermost line-area that contains the first destination area. If the first destination area is not contained in a line-area, the "destination-placement-offset" property instead directly specifies the distance to the top of the destination area.

If the specification of destination-placement-offset would result in a distance longer than the distance from the start of the document, the distance from the start of the document should be used.

If the specified distance would push the first destination area below the page-area, the distance should be decreased so the whole first destination area becomes visible, if possible. If the first destination area is higher than the page, the top of the area should be aligned with the top of the page.

**7.23.6. “external-destination”**

XSL Definition:

<i>Value:</i>	empty string   <uri-specification>
<i>Initial:</i>	empty string
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

**<uri-specification>**

Specifies the destination resource (or, when a fragment identifier is given, sub-resource).

How the destination (sub-)resource is used and/or displayed is application and implementation-dependent. In typical browsing applications, the destination resource is displayed in the browser positioned so

that some rendered portion resulting from the processing of some part of the specific destination sub-resource indicated by the fragment identifier is in view.

### 7.23.7. “**indicate-destination**”

XSL Definition:

<i>Value:</i>	true   false
<i>Initial:</i>	false
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

Values have the following meanings:

#### **true**

The areas that belong to the link target when traversed should, in a system-dependent manner, be indicated.

#### **false**

No special indication should be made.



This could be indicated in any feasible way, e.g., by reversed video, etc.

### 7.23.8. “**internal-destination**”

XSL Definition:

<i>Value:</i>	empty string   <idref>
<i>Initial:</i>	empty string
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

#### **<idref>**

Specifies the destination flow object within the formatting object tree. This property allows the destination flow object node to be explicitly specified.

### 7.23.9. “**show-destination**”

XSL Definition:

<i>Value:</i>	replace   new
<i>Initial:</i>	replace
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive



Values have the following meanings:

***replace***

The current document view should be replaced. However, if the destination area(s) are already available in a page/region, those areas should simply be moved/scrolling "into sight".

***new***

A new (additional) document view should always be opened.

Specifies where the destination resource should be displayed.

### 7.23.10. “starting-state”

XSL Definition:

<i>Value:</i>	show   hide
<i>Initial:</i>	show
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

Specifies how the formatting object to which it applies is initially displayed.


Values have the following meanings:

***show***

The content of the formatting object is a candidate for being displayed initially.

***hide***

The content of the formatting object is not a candidate for being displayed initially.

 For details of the typical usage of this property, see the description of § 6.9.3 – [fo:multi-switch](#) on page 188 and § 6.11.2 – [fo:bookmark](#) on page 208.

### 7.23.11. “switch-to”


XSL Definition:

<i>Value:</i>	xsl-preceding   xsl-following   xsl-any   <name>[ <name>]*
<i>Initial:</i>	xsl-any
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive


Values have the following meanings:

***xsl-preceding***

Activating the switch should result in the current fo:multi-case being replaced by its preceding sibling.

 The current fo:multi-case is the closest ancestor fo:multi-case.

In other words, the current fo:multi-switch should switch to the previous sibling of the fo:multi-case that is currently selected.

 The current fo:multi-switch is the closest ancestor fo:multi-switch.

If the current fo:multi-case is the first sibling, xsl-preceding should switch to the last fo:multi-case sibling.

### ***xsl-following***

Activating the switch should result in that the current fo:multi-case is replaced by its next sibling.

If the current fo:multi-case is the last sibling, xsl-following should switch to the first fo:multi-case sibling.

### ***xsl-any***

Activating the switch should allow the user to select any other fo:multi-case sibling.


If there is only a single other fo:multi-case, the toggle should immediately switch to it (and not show that single choice to the user).

### **<name>**

A name matching a case-name of an fo:multi-case.

Specifies what fo:multi-case object(s) this fo:multi-toggle shall switch to.

If switch-to is a name list, the user can switch to any of the named multi-case objects. If a multi-toggle with a single name is activated, it should immediately switch to the named multi-case.

 How to actually select the multi-case from a list is system dependent.

## **7.23.12. “target-presentation-context”**

XSL Definition:

<i>Value:</i>	use-target-processing-context   <uri-specification>
<i>Initial:</i>	use-target-processing-context
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

Values have the following meanings:


### ***use-target-processing-context***


The context specified by the "target-processing-context" property shall be used.

**<uri-specification>**

Specifies the limited context in which the resource should be presented if the external destination is a resource of a processed structured media type for which a limited presentational context makes sense (e.g., XML, XHTML, SVG).

This property is ignored if the "external-destination" property has an empty string value or if the external destination is not of a processed structured media type for which a limited presentational context makes sense.

 For example, an XML and XSL implementation may parse the XML document, but begin XSLT processing by applying templates to the node set indicated by the "target-presentation-context" property.

 If this is a node other than the document root, numbering and other contextually-dependent presentation may differ between implementations. Some implementations may want to make this tradeoff for memory or performance reasons.

**7.23.13. “target-processing-context”**

XSL Definition:

<i>Value:</i>	document-root   <uri-specification>
<i>Initial:</i>	document-root
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

Values have the following meanings:


***document-root***

The root of the document of the external-destination is used.

**<uri-specification>**

Specifies the root of a virtual document that the processor preparing the new presentation should process if the external destination is a resource of a processed structured media type (e.g., XML, SVG).

This property is ignored if the "external-destination" property has an empty string value or if the external destination is not of a processed structured media type.

 Not all URI-specifications will be sensible roots, e.g., an XPointer that gives a string range into an XML document.

If the root is not valid for the media type the processor may ignore this property.

**7.23.14. “target-stylesheet”**

XSL Definition:

<i>Value:</i>	use-normal-stylesheet   <uri-specification>
<i>Initial:</i>	use-normal-stylesheet
<i>Inherited:</i>	no

<i>Percentages:</i>	N/A
<i>Media:</i>	interactive


Values have the following meanings:

### ***use-normal-stylesheet***


The implementation will discover stylesheets using its usual methods.

### ***<uri-specification>***

Specifies the stylesheet that shall be used for processing the resource. This stylesheet shall be used instead of any other stylesheet that otherwise would be used.

 For example from HTTP header information, XML stylesheet processing instructions, or XHTML style and link elements.

This property is ignored if the "external-destination" property has an empty string value or if the external destination is not of a media type that uses stylesheets.

 In this version of XSL, only a single stylesheet URI-specification is permitted. A future version of XSL may extend the stylesheet specification.

## **7.24. Properties for Indexing**

### **7.24.1. "index-class"**

XSL Definition:

<i>Value:</i>	<string>
<i>Initial:</i>	empty string
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	all


Associates an index class with a formatting object that also has an index key specified.

### ***<string>***

Specifies the name of the index class.

All elements with an index class that is an empty string are in the same index class. That class is distinct from all other classes.

The index-class property is ignored on any formatting object for which an index-key property has not been specified.

 Index class values enable control over how page numbers are merged into ranges. Page numbers from different classes are not merged so specifying an index class can be used to control, for example, whether a range of pages crossing from the preface into the first chapter will be rendered as "vi-14" or "vi-xx, 1-14".

### 7.24.2. “index-key”

XSL Definition:

<i>Value:</i>	<string>
<i>Initial:</i>	none
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	all

Associates an index key with the formatting object on which it is specified.

<*string*>

Specifies the index key.

All index keys with the same value identify the same index item for the purpose of generating lists of page number citations.

### 7.24.3. “page-number-treatment”

XSL Definition:

<i>Value:</i>	link   no-link
<i>Initial:</i>	no-link
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	interactive

Specifies whether or not page numbers in the index should be hyperlinks.

Values have the following meanings:

#### *link*

Page numbers in the index should be navigable links back to the source of the reference as for fo:basic-link.

#### *no-link*

Page numbers should not be links.

### 7.24.4. “merge-ranges-across-index-key-references”

XSL Definition:

<i>Value:</i>	merge   leave-separate
<i>Initial:</i>	merge
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	all

Specifies whether or not consecutive page numbers from different fo:index-key-reference formatting objects are to be merged into single ranges.

Values have the following meanings:

***merge***

Merge consecutive page numbers into ranges regardless of which fo:index-key-reference formatting objects referred to them.

***leave-separate***

Do not merge ranges across fo:index-key-reference formatting objects.

### 7.24.5. “merge-sequential-page-numbers”

XSL Definition:

<i>Value:</i>	merge   leave-separate
<i>Initial:</i>	merge
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	all

Specifies whether or not sequential page numbers within an fo:index-key-reference or fo:index-page-citation-list (if merge-ranges-across-index-key-references is "merge") are merged into a range.

Values have the following meanings:

***merge***

Merge three or more consecutive page numbers into a range.

***leave-separate***

Do not merge page numbers into ranges.

### 7.24.6. “merge-pages-across-index-key-references”

XSL Definition:

<i>Value:</i>	merge   leave-separate
<i>Initial:</i>	merge
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	all

Specifies whether or not multiple references to the same page by different fo:index-key-reference formatting objects will be retained as individual cited page items or if only a single cited page item will be retained.

Values have the following meanings:

***merge***

Only the first occurrence, in document order of the fo:index-key-reference formatting objects, of a reference to a given page number generated by multiple fo:index-key-reference formatting objects is retained.

***leave-separate***

Multiple references to the same page generated by different fo:index-key-reference formatting objects are retained.

**7.24.7. “ref-index-key”**

XSL Definition:

<i>Value:</i>	<string>
<i>Initial:</i>	none, value required
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	all

References an index key.

<***string***>

Specifies the "index-key" of objects in the formatting object tree.

Reference to the objects having an "index-key" trait equal to the specified "ref-index-key". It is an error if there are no formatting objects with the specified index key.

**7.25. Properties for Markers****7.25.1. “marker-class-name”**

XSL Definition:

<i>Value:</i>	<name>
<i>Initial:</i>	an empty name
<i>Inherited:</i>	no, a value is required
<i>Percentages:</i>	N/A
<i>Media:</i>	paged

Values have the following meanings:

<***name***>

Names used as identifiers must be unique among fo:markers that are (conceptually) attached to the same area.

If the name is empty or if a name-conflict is encountered, an error shall be reported. A processor may then continue processing.

This property identifies the fo:marker as being in a group with others that have the same name, each of which becomes a candidate to be retrieved by an fo:retrieve-marker or fo:retrieve-table-marker that has a "retrieve-class-name" property of the same value.

**7.25.2. “retrieve-boundary-within-table”**

XSL Definition:

<i>Value:</i>	table   table-fragment   page
---------------	-------------------------------

<i>Initial:</i>	table
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	paged



The terms defined in § 6.13.7 – [fo:retrieve-table-marker](#) on page 231 are used here.

### ***table***

Specifies that the retrieve scope area set is limited to the primary retrieve scope area and the retrieve scope areas that precede the primary retrieve scope area.

### ***table-fragment***

Specifies that the retrieve scope area set is limited to the primary retrieve scope area.

### ***page***

Specifies that the retrieve scope area set is limited to the primary retrieve scope area and the retrieve scope areas that both precede this primary retrieve scope and are on the same page as the primary retrieve scope area.

## **7.25.3. “retrieve-class-name”**

XSL Definition:

<i>Value:</i>	<name>
<i>Initial:</i>	an empty name
<i>Inherited:</i>	no, a value is required
<i>Percentages:</i>	N/A
<i>Media:</i>	paged

Values have the following meanings:

### **<name>**

A name that matches the "marker-class-name" property value of an fo:marker.

This property constrains that the fo:marker whose children are retrieved by the fo:retrieve-marker or fo:retrieve-table-marker must have a "marker-class-name" property value that is the same as the value of this property.

## **7.25.4. “retrieve-position”**

XSL Definition:

<i>Value:</i>	first-starting-within-page   first-including-carryover   last-starting-within-page   last-ending-within-page
<i>Initial:</i>	first-starting-within-page
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	paged



The term "containing page" is used here to mean the page that contains the first area generated or returned by the children of the retrieved fo:marker.

Values have the following meanings:

***first-starting-within-page***

Specifies a preference for retrieving the children of an fo:marker attached to an area that is

- within the containing page
- whose "is-first" trait is set to "true"

and that precedes in the area tree, using pre-order traversal order, any other similarly constrained area that has an attached fo:marker with the same value of the "marker-class-name" property.

***first-including-carryover***

Specifies a preference for retrieving the children of an fo:marker attached to an area that is within the containing page and that precedes in the area tree, using pre-order traversal order, any other similarly constrained area that has an attached fo:marker with the same value of the "marker-class-name" property.

***last-starting-within-page***

Specifies a preference for retrieving the children of an fo:marker attached to an area that is

- within the containing page
- whose "is-first" trait is set to "true"

and that follows in the area tree, using pre-order traversal order, any other similarly constrained area that has an attached fo:marker with the same value of the "marker-class-name" property.

***last-ending-within-page***

Specifies a preference for retrieving the children of an fo:marker attached to an area that is within the containing page whose "is-last" trait is set to "true" and that follows in the area tree, using pre-order traversal order, any other similarly constrained area that has an attached fo:marker with the same value of the "marker-class-name" property.

This property specifies the preference for which fo:marker's children shall be retrieved by an fo:retrieve-marker, based on the areas returned by the parent of the fo:marker relative to the areas returned by the parents of other identically named fo:marker's.

**7.25.5. “retrieve-boundary”**

XSL Definition:

<i>Value:</i>	page   page-sequence   document
<i>Initial:</i>	page-sequence
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	paged

The term "containing page" is used here to mean the page that contains the first area generated or returned by the children of the retrieved fo:marker.

Values have the following meanings:

***page***

Specifies that the children of any fo:markers whose parent generated or returned a normal area within the containing page or generated non-normal area within the containing page may be retrieved by this fo:retrieve-marker.

***page-sequence***

Specifies that only the children of fo:markers that are descendants of any fo:flow within the containing fo:page-sequence may be retrieved by this fo:retrieve-marker.

***document***

Specifies that the children of any fo:marker that is a descendant of any fo:flow within the document may be retrieved by this fo:retrieve-marker.

### 7.25.6. “retrieve-position-within-table”

XSL Definition:

<i>Value:</i>	first-starting   first-including-carryover   last-starting   last-ending
<i>Initial:</i>	first-starting
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	paged



The terms defined in § 6.13.7 – fo:retrieve-table-marker on page 231 are used here.

***first-starting***

Specifies a preference for retrieving the children of an fo:marker attached to an area

- that is a descendant of the primary retrieve scope area,
- whose "is-first" trait is set to "true"
- and precedes in the area tree, using pre-order traversal order, any other similarly constrained area that has an attached fo:marker with the same value of the "marker-class-name" property.

***first-including-carryover***

Specifies a preference for retrieving the children of an fo:marker attached to an area

- that is a descendant of the primary retrieve scope area,
- and that precedes in the area tree, using pre-order traversal order, any other similarly constrained area that has an attached fo:marker with the same value of the "marker-class-name" property.

***last-starting***

Specifies a preference for retrieving the children of an fo:marker attached to an area

- that is a descendant of a retrieve scope area,
- whose "is-first" trait is set to "true"

- and that follows in the area tree, using pre-order traversal order, any other similarly constrained area that has an attached fo:marker with the same value of the "marker-class-name" property.

***last-ending***

Specifies a preference for retrieving the children of an fo:marker attached to an area

- that is a descendant of a retrieve scope area,
- and whose "is-last" trait is set to "true" and that follows in the area tree, using pre-order traversal order, any other similarly constrained area that has an attached fo:marker with the same value of the "marker-class-name" property.

This property specifies the preference for which fo:marker's children shall be retrieved by an fo:retrieveable-marker, based on the areas returned by the parent of the fo:marker relative to the areas returned by the parents of other identically named fo:marker's.

**7.26. Properties for Number to String Conversion****7.26.1. “format”**

XSL Definition:

<i>Value:</i>	<string>
<i>Initial:</i>	1
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	all

This property is defined in [XSLT]: Number to String Conversion Attributes.

**7.26.2. “grouping-separator”**

XSL Definition:

<i>Value:</i>	<character>
<i>Initial:</i>	no separator
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	all

This property is defined in [XSLT]: Number to String Conversion Attributes.

**7.26.3. “grouping-size”**

XSL Definition:

<i>Value:</i>	<number>
<i>Initial:</i>	no grouping
<i>Inherited:</i>	no

<i>Percentages:</i>	N/A
<i>Media:</i>	all

This property is defined in [XSLT]: Number to String Conversion Attributes.

#### 7.26.4. “letter-value”

XSL Definition:

<i>Value:</i>	auto   alphabetic   traditional
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	all

This property is defined in [XSLT]: Number to String Conversion Attributes. A value of "auto" corresponds to the XSLT definition for when the attribute is not specified.

## 7.27. Pagination and Layout Properties

The following pagination and layout properties are all XSL only.

### 7.27.1. “blank-or-not-blank”

XSL Definition:

<i>Value:</i>	blank   not-blank   any   inherit
<i>Initial:</i>	any
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property forms part of a selection rule to determine if the referenced page-master is eligible for selection at this point in the page-sequence.

The values have the following meanings:

#### **blank**

This master is eligible for selection if a page must be generated (e.g., to maintain proper page parity at the start or end of the page-sequence) and there are no areas from any of the fo:flow flows within the containing fo:page-sequence to be put on that page.

#### **not-blank**

This master is eligible for selection if this page contains areas from any of the fo:flow flows within the containing fo:page-sequence.

#### **any**

This master is always eligible for selection.

### 7.27.2. “column-count”

XSL Definition:

<i>Value:</i>	<number>   inherit
<i>Initial:</i>	1
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### <number>

A positive integer. If a non-positive or non-integer value is provided, the value will be rounded to the nearest integer value greater than or equal to 1.

Specifies the number of columns in the region.

A value of 1 indicates that this is not a multi-column region.

### 7.27.3. “column-gap”

XSL Definition:

<i>Value:</i>	<length>   <percentage>   inherit
<i>Initial:</i>	12.0pt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of the region being divided into columns.
<i>Media:</i>	visual

Values have the following meanings:

#### <length>

This is an unsigned length. If a negative value has been specified a value of 0pt will be used.

#### <percentage>

The value is a percentage of the inline-progression-dimension of the content-rectangle of the region.

Specifies the width of the separation between adjacent columns in a multi-column region. See the description in § 6.4.14 – [fo:region-body](#) on page 102 for further details.

### 7.27.4. “extent”

XSL Definition:

<i>Value:</i>	<length>   <percentage>   inherit
<i>Initial:</i>	0.0pt
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to the corresponding block-progression-dimension or inline-progression-dimension of the page-view-viewport-area.

*Media:* visual

Values have the following meanings:

**<length>**

This is an unsigned length. If a negative value has been specified a value of 0pt will be used.

**<percentage>**

The value is a percentage of the corresponding block-progression-dimension or inline-progression-dimension of the page-viewport-area.

Specifies the inline-progression-dimension of the region-start or region-end or the block-progression-dimension of the region-before or region-after.

### 7.27.5. “flow-name”

XSL Definition:

*Value:* <name>  
*Initial:* an empty name  
*Inherited:* no, a value is required  
*Percentages:* N/A  
*Media:* visual

Values have the following meanings:

**<name>**

Names used as identifiers must be unique within an fo:page-sequence.

If the name is empty or if a name-conflict is encountered, an error shall be reported. A processor may then continue processing.

Defines the name of the flow.

The flow-name and region-name are used to assign the flow's content (or static-content's content) to a specific region or series of regions in the layout. In XSL this is done by specifying the name of the target region as the flow-name. (For example, text placed in the region-body would specify flow-name="xsl-region-body".)



The flow-names reserved in XSL are: xsl-region-body, xsl-region-before, xsl-region-after, xsl-region-start, xsl-region-end, xsl-before-float-separator, xsl-footnote-separator.

### 7.27.6. “force-page-count”

XSL Definition:

*Value:* auto | even | odd | end-on-even | end-on-odd | no-force | inherit  
*Initial:* auto  
*Inherited:* no  
*Percentages:* N/A  
*Media:* visual

Force-page-count is used to impose a constraint on the number of pages in a page-sequence. In the event that this constraint is not satisfied, an additional page will be added to the end of the sequence. This page becomes the "last" page of that sequence.

The values have the following meanings:

**auto**

Force the last page in this page-sequence to be an odd-page if the initial-page-number of the next page-sequence is even. Force it to be an even-page if the initial-page-number of the next page-sequence is odd. If there is no next page-sequence or if the value of its initial-page-number is "auto" do not force any page.

**even**

Force an even number of pages in this page-sequence.

**odd**

Force an odd number of pages in this page-sequence.

**end-on-even**


Force the last page in this page-sequence to be an even-page.

**end-on-odd**

Force the last page in this page-sequence to be an odd-page.

**no-force**

Do not force either an even or an odd number of pages in this page-sequence

 Whether a page is an odd-page or even-page is determined from the *folio-number* trait.

**7.27.7. “initial-page-number”**

XSL Definition:

<i>Value:</i>	auto   auto-odd   auto-even   <number>   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

**auto**

The initial folio number shall be set to 1 if no previous fo:page-sequence exists in the document.

If a preceding page-sequence exists, the initial folio number will be one greater than the last number for that sequence.

**auto-odd**

A value is determined in the same manner as for "auto". If that value is an even number 1 is added.

***auto-even***

A value is determined in the same manner as for "auto". If that value is an odd number 1 is added.

***<number>***

A positive integer. If a non-positive or non-integer value is provided, the value will be rounded to the nearest integer value greater than or equal to 1.

Sets the initial folio number to be used in this page-sequence.

**7.27.8. “master-name”**

XSL Definition:

<i>Value:</i>	<name>
<i>Initial:</i>	an empty name
<i>Inherited:</i>	no, a value is required
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***<name>***

Names identify masters, may not be empty and must be unique.

If this property is specified on an fo:simple-page-master, it provides an identifying name of the master. This name is subsequently referenced as the value of properties on the following formatting objects: fo:single-page-master-reference, fo:repeatable-page-master-reference, and fo:conditional-page-master-reference to request the use of this master when creating a page instance. It may also be used on an fo:page-sequence to specify the use of this master when creating page instances.

If this property is specified on an fo:page-sequence-master, it provides an identifying name of the master. This name is subsequently referenced as the value of properties on the fo:page-sequence to request the use of this page-sequence-master when creating page instances.

A master-name must be unique across all page-masters and page-sequence-masters.

If the name is empty or if a name-conflict is encountered, an error shall be reported. A processor may then continue processing.

**7.27.9. “master-reference”**

XSL Definition:

<i>Value:</i>	<name>
<i>Initial:</i>	an empty name
<i>Inherited:</i>	no, a value is required
<i>Percentages:</i>	N/A
<i>Media:</i>	visual



Values have the following meanings:

**<name>**

The names need not be unique, but may not be empty and must refer to a master-name that exists within the document.

Selecting a master:

- If this property is specified on the fo:page-sequence it specifies the name of the page-sequence-master or page-master to be used to create pages in the sequence.
- If this property is specified on the fo:single-page-master-reference, it specifies the name of the page-master to be used to create a single page instance.
- If this property is specified on the fo:repeatable-page-master-reference, it specifies the name of the page-master to be used in repetition until the content is exhausted or the maximum-repeats limit is reached, whichever occurs first.
- If this property is specified on the fo:conditional-page-master-reference, it specifies the name of the page-master to be used whenever this alternative is chosen.

If the name is empty or if a name-conflict is encountered, an error shall be reported. A processor may then continue processing.

### 7.27.10. “maximum-repeats”

XSL Definition:

<i>Value:</i>	<number>   no-limit   inherit
<i>Initial:</i>	no-limit
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the constraint on the maximum number of pages in the sub-sequence of pages that may be generated by an fo:page-sequence that uses the fo:repeatable-page-master-reference or fo:repeatable-page-master-alternatives on which this property is specified.

The values have the following meanings:

***no-limit***

No constraint is specified.

**<number>**

The maximum number of pages in the sub-sequence.

The value is an integer greater than or equal to 0.

If a fractional value or a value less than 0 is specified, it will be rounded to the nearest integer greater than or equal to 0.

A value of 0 indicates this master-reference will not be used.

### 7.27.11. "media-usage"

XSL Definition:

<i>Value:</i>	auto   paginate   bounded-in-one-dimension   unbounded
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	NA
<i>Media:</i>	visual

The "media-usage" property is used to control how the selected display medium is used to present the page(s) specified by the stylesheet.

Values for the property have the following meaning:

#### ***auto***

The User Agent determines which value of "media-usage" (other than the "auto" value) is used. The User Agent may consider the type of media on which the presentation is to be placed in making this determination.



For example, the User Agent could use the following decision process. If the media is not continuous and is of fixed bounded size, then the "paginate" (described below) is used. Otherwise, the "bounded-in-one-dimension" is used.

#### ***paginate***

A sequence of pages is generated from the fo:page-sequences that are children of the fo:root as described in § 6.4.5 – fo:page-sequence on page 91.


#### ***bounded-in-one-dimension***

Only one page is generated per fo:page-sequence descendant from the fo:root. Exactly one of "page-height" or "page-width" must be specified on the first page master that is used. The size of the page in the other dimension is determined by the content flowed into the page.

It is an error if more or less than one of "page-height" or "page-width" is specified on the first page master that is used. The User Agent may recover as follows: The recovery depends on the "reference-orientation" of the page and "writing-mode" of the region to which the fo:flow is assigned. There are four cases: (1) the "reference-orientation" is "0" or "180" and the "writing-mode" is horizontal; (2) the "reference-orientation" is "0" or "180" and the "writing-mode" is vertical; (3) the "reference-orientation" is "90" or "270" and the "writing-mode" is horizontal; (4) the "reference-orientation" is "90" or "270" and the "writing-mode" is vertical. For cases (1) and (4), the "page-width" is bounded and the "page-height" is not bounded. For case (2) and (3), the "page-height" is bounded and the "page-width" is not bounded.

#### ***unbounded***

Only one page is generated per fo:page-sequence descendant from the fo:root. Neither "page-height" nor "page-width" may be specified on any page master that is used. If a value is specified for either property, it is an error and a User Agent may recover by ignoring the specified value. Each page begins at the before-edge and start-edge of the page and the page extends as far as necessary toward the after-edge and end-edge to contain all the content of the page-sequence which generates the page.

 This implies that no text content is automatically wrapped; that is, each block will have a single line for each text node that does not contain a U+000A character. If more than one line is generated, then the sequence of characters that generated the glyphs in each such line must have been bounded in the original text node, either by the beginning or end of that text node or by an U+000A character within that text node. Control over the treatment of the U+000A character is described in § 7.16.7 – “linefeed-treatment” on page 322.

### 7.27.12. “odd-or-even”

XSL Definition:

<i>Value:</i>	odd   even   any   inherit
<i>Initial:</i>	any
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property forms part of a selection rule to determine if the referenced page-master is eligible for selection at this point in the page-sequence.

The values have the following meanings:

***odd***


This master is eligible for selection if the folio number is odd.

***even***

This master is eligible for selection if the folio number is even.

***any***

This master is eligible for selection regardless of whether the folio number is odd or even.

 "Folio number" refers to the *folio-number* trait for the page to be generated.

### 7.27.13. “page-height”

XSL Definition:

<i>Value:</i>	auto   indefinite   <length>   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***auto***

The "page-height" shall be determined, in the case of continuous media, from the size of the User Agent window, otherwise from the size of the media. If media information is not available this dimension shall be implementation-defined.



A fallback to 11.0in would fit on both Letter size (8.5in by 11.0in) and A4 size pages.

### *indefinite*

The height of the page is determined from the size of the laid-out content.

"Page-width" and "page-height" may not both be set to "indefinite". Should that occur, the dimension that is parallel to the block-progression-direction, as determined by the "reference-orientation" and "writing-mode" of the page-reference-area will remain "indefinite" and the other will revert to "auto".

### *<length>*

Specifies a fixed height for the page.

Specifies the height of a page.



The values for the "page-width" and "page-height" properties are intended to permit the size specification to match the handling of a frameset in a browser window when the media is continuous and to match pages when the media is paged.

A User Agent may provide a way to declare the media for which formatting is to be done. This may be different from the media on which the formatted result is viewed. For example, a browser User Agent may be used to preview pages that are formatted for sheet media. In that case, the size calculation is based on the media for which formatting is done rather than the media being currently used.

## 7.27.14. "page-position"

XSL Definition:

<i>Value:</i>	only   first   last   rest   any   inherit
<i>Initial:</i>	any
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property forms part of a selection rule to determine if the referenced page-master is eligible for selection at this point in the page-sequence.

The values have the following meanings:

### *only*

This master is eligible for selection if this is the only page (i.e. the page is both first and last) page in the page-sequence.

### *first*

This master is eligible for selection if this is the first page in the page-sequence.

### *last*


This master is eligible for selection if this is the last page in the page-sequence.

### *rest*

This master is eligible for selection if this is not the first page nor the last page in the page-sequence.

**any**

This master is eligible for selection regardless of page positioning within the page-sequence.

 Several of these values can be true simultaneously; for example, 'any' is always true and 'only' is true when both 'first' and 'last' are true. For that reason, it is necessary to order the fo:conditional-page-master-references so that the least inclusive test is performed before the more inclusive test which are also true.

**7.27.15. “page-width”**


XSL Definition:

<i>Value:</i>	auto   indefinite   <length>   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

**auto**

The "page-width" shall be determined, in the case of continuous media, from the size of the User Agent window, otherwise from the size of the media. If media information is not available this dimension shall be implementation-defined.

 A fallback to 8.26in would fit on both 8+1/2x11 and A4 pages.

**indefinite**

The width of the page is determined from the size of the laid-out content.

"Page-width" and "page-height" properties may not both be set to "indefinite". Should that occur, the dimension that is parallel to the block-progression-direction, as determined by the "reference-orientation" and "writing-mode" of the page-reference-area will remain "indefinite" and the other will revert to "auto".

**<length>**

Specifies a fixed width for the page.

Specifies the width of a page.

**7.27.16. “precedence”**

XSL Definition:

<i>Value:</i>	true   false   inherit
<i>Initial:</i>	false
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***false***

A value of false specifies that this region does not extend up to the start-edge and end-edge of the content-rectangle of the page-reference-area, but has its inline-progression-dimension reduced by the incursions of the adjacent regions.

***true***

A value of true specifies that the inline-progression-dimension of this region extends up to the start-edge and end-edge of the content-rectangle of the page-reference-area.

Specifies which region (i.e., region-before, region-after, region-start, or region-end) takes precedence in terms of which may extend into the corners of the simple-page-master.

### 7.27.17. “region-name”

XSL Definition:

<i>Value:</i>	xsl-region-body   xsl-region-start   xsl-region-end   xsl-region-before   xsl-region-after   <name>
<i>Initial:</i>	see prose
<i>Inherited:</i>	no, a value is required
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***xsl-region-body***

Reserved region-name for use as the default name of fo:region-body. This name may not be used on any other class of region.

***xsl-region-start***

Reserved region-name for use as the default name of fo:region-start. This name may not be used on any other class of region.

***xsl-region-end***

Reserved region-name for use as the default name of fo:region-end. This name may not be used on any other class of region.

***xsl-region-before***

Reserved region-name for use as the default name of fo:region-before. This name may not be used on any other class of region.

***xsl-region-after***

Reserved region-name for use as the default name of fo:region-after. This name may not be used on any other class of region.

**<name>**

Names used as identifiers must be unique within a page-master.

This property is used to identify a region within a simple-page-master.

The "region-name" may be used to differentiate a region that lies on a page-master for an odd page from a region that lies on a page-master for an even page. In this usage, once a name is used for a specific class of region (start, end, before, after, or body), that name may only be used for regions of the same class in any other page-master. The reserved names may only be used in the manner described above.

### 7.27.18. “flow-map-name”

XSL Definition:

<i>Value:</i>	<name>
<i>Initial:</i>	none, a value is required
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	all

Values have the following meanings:

**<name>**

Names identify flow-maps. They may not be empty and must be unique.

This property provides an identifying name for an fo:flow-map, which is subsequently referenced as the value of the flow-map-reference property on an fo:page-sequence.

### 7.27.19. “flow-map-reference”

XSL Definition:

<i>Value:</i>	<name>
<i>Initial:</i>	see prose
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	all

Values have the following meanings:

**<name>**

The name identifies a flow map; it may not be empty and must refer to a flow-map-name that exists within the document.

Specifies the flow map to be used for assigning flows to regions within the page-sequence.

If no flow-map-reference is specified on a page-sequence, then the flow-map in effect is the implicit flow-map specified in § 6.4.5 – fo:page-sequence on page 91.

### 7.27.20. “flow-name-reference”

XSL Definition:

<i>Value:</i>	<name>
<i>Initial:</i>	none, a value is required
<i>Inherited:</i>	no

*Percentages:* N/A

*Media:* all

Values have the following meanings:

**<name>**

The name identifies a flow; it may not be empty and must refer to a flow-name that exists within the document.

Specifies a flow to be used within a sequence of flows in the flow-source-list of a particular assignment of flows to regions.

### 7.27.21. “region-name-reference”

XSL Definition:

*Value:* <name>

*Initial:* none, a value is required

*Inherited:* no

*Percentages:* N/A

*Media:* all

Values have the following meanings:

**<name>**

The name identifies a region; it may not be empty and must refer to a region-name that exists within the document.

Specifies a flow to be used within a sequence of regions in the flow-target-list of a particular assignment of flows to regions.

## 7.28. Table Properties

### 7.28.1. “border-after-precedence”

XSL Definition:

*Value:* force | <integer> | inherit

*Initial:* fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0

*Inherited:* no

*Percentages:* N/A

*Media:* visual

***force***

The precedence is higher than any <integer>.

**<integer>**

A numeric precedence specification. A higher value has a higher precedence than a lower one.

Specifies the precedence of the border specification on this formatting object for the border-after.



### 7.28.2. “border-before-precedence”

XSL Definition:

<i>Value:</i>	force   <integer>   inherit
<i>Initial:</i>	fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the precedence of the border specification on this formatting object for the border-before.

See definition of property border-after-precedence (§ 7.28.1 – “border-after-precedence” on page 382).

### 7.28.3. “border-collapse”

CSS2 Definition:

<i>Value:</i>	collapse   collapse-with-precedence   separate   inherit
<i>Initial:</i>	collapse
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["border-collapse" property](http://www.w3.org/TR/REC-CSS2/tables.html#propdef-border-collapse)

<http://www.w3.org/TR/REC-CSS2/tables.html#propdef-border-collapse>

#### *collapse*

The value "collapse" selects the collapsing borders model.

#### *separate*

The value "separate" selects the separated borders border model.

This property selects a table's border model. The value "separate" selects the separated borders border model. The value "collapse" selects the collapsing borders model.

*XSL modifications to the CSS definition:*

XSL adds the following value with the following meaning:

#### *collapse-with-precedence*

The value "collapse-with-precedence" selects the collapsing borders model and the use of the border precedence properties for conflict resolution.

### 7.28.4. “border-end-precedence”

XSL Definition:

<i>Value:</i>	force   <integer>   inherit
---------------	-----------------------------

<i>Initial:</i>	fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the precedence of the border specification on this formatting object for the border-end.

See definition of property border-after-precedence (§ 7.28.1 – “border-after-precedence” on page 382).

### 7.28.5. “border-separation”

XSL Definition:

<i>Value:</i>	<length-bp-ip-direction>   inherit
<i>Initial:</i>	.block-progression-direction="Opt" .inline-progression-direction="Opt"
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

#### <length-bp-ip-direction>

The lengths specify the distance that separates adjacent cell borders in the row-stacking-direction (given by the block-progression-direction of the table), and in the column-stacking-direction (given by the inline-progression-direction of the table).

In the separate borders model, each cell has an individual border. The "border-separation" property specifies the distance between the borders of adjacent cells. This space is filled with the background of the table element. Rows, columns, row groups, and column groups cannot have borders (i.e., user agents must ignore the border properties for those elements).

### 7.28.6. “border-start-precedence”

XSL Definition:

<i>Value:</i>	force   <integer>   inherit
<i>Initial:</i>	fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the precedence of the border specification on this formatting object for the border-start.

See definition of property border-after-precedence (§ 7.28.1 – “border-after-precedence” on page 382).

### 7.28.7. “caption-side”

CSS2 Definition:

<i>Value:</i>	before   after   start   end   top   bottom   left   right   inherit
<i>Initial:</i>	before
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["caption-side" property](#)

<http://www.w3.org/TR/REC-CSS2/tables.html#q6>

***top***

Positions the caption box above the table box.

***bottom***

Positions the caption box below the table box.

***left***

Positions the caption box to the left of the table box.

***right***

Positions the caption box to the right of the table box.

This property specifies the position of the caption box with respect to the table box.

Captions above or below a "table" element are formatted very much as if they were a block element before or after the table, except that (1) they inherit inheritable properties from the table, and (2) they are not considered to be a block box for the purposes of any "compact" or "run-in" element that may precede the table.

A caption that is above or below a table box also behaves like a block box for width calculations; the width is computed with respect to the width of the table box's containing block.

For a caption that is on the left or right side of a table box, on the other hand, a value other than "auto" for "width" sets the width explicitly, but "auto" tells the user agent to choose a "reasonable width". This may vary between "the narrowest possible box" to "a single line", so we recommend that users do not specify "auto" for left and right caption widths.

To align caption content horizontally within the caption box, use the "text-align" property. For vertical alignment of a left or right caption box with respect to the table box, use the "vertical-align" property. The only meaningful values in this case are "top", "middle", and "bottom". All other values are treated the same as "top".

*XSL modifications to the CSS definition:*

Insert the following writing-mode relative values:

***before***

Positions the caption before the table in the block-progression-direction.

***after***

Positions the caption after the table in the block-progression-direction.

***start***

Positions the caption before the table in the inline-progression-direction.

***end***

Positions the caption after the table in the inline-progression-direction.

The CSS qualifications (1) and (2) do not apply. The last three sentences in the last paragraph (referencing "vertical-align") do not apply.

**7.28.8. “column-number”**

XSL Definition:

<i>Value:</i>	<number>
<i>Initial:</i>	see prose
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

**<number>**

A positive integer. If a non-positive or non-integer value is provided, the value will be rounded to the nearest integer value greater than or equal to 1.

For an fo:table-column formatting object, it specifies the column-number of the table cells that may use properties from this fo:table-column formatting object by using the from-table-column() function. The initial value is 1 plus the column-number of the previous table-column, if there is a previous table-column, and otherwise 1.

For an fo:table-cell it specifies the number of the first column to be spanned by the table-cell. The initial value is the current column-number. For the first table-cell in a table-row, the current column number is 1. For other table-cells, the current column-number is the column-number of the previous table-cell in the row plus the number of columns spanned by that previous cell.



There is no requirement for column-numbers to be monotonically increasing from formatting object to formatting object.


**7.28.9. “column-width”**

XSL Definition:


<i>Value:</i>	<length>   <percentage>
<i>Initial:</i>	see prose
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of table
<i>Media:</i>	visual

**<length>**

The "column-width" property specifies the width of the column whose value is given by the "column-number" property. This property, if present, is ignored if the "number-columns-spanned" property is greater than 1. The "column-width" property must be specified for every column, unless the automatic table layout is used.

 The use of the "proportional-column-width()" function is only permitted when the fixed table layout is used.

If the use of proportional column widths are desired on a table of an unknown explicit width, the inline-progression-dimension cannot be specified to be "auto". Instead, the width must be specified as a percentage. For example, setting table-layout="fixed" and inline-progression-dimension="100%" would allow proportional column widths while simultaneously creating a table as wide as possible in the current context.

 The result of using a percentage for the width may be unpredictable, especially when using the automatic table layout.

**7.28.10. "empty-cells"**

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x79>

<i>Value:</i>	show   hide   inherit
<i>Initial:</i>	show
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["empty-cells" property](#)

<http://www.w3.org/TR/REC-CSS2/tables.html#propdef-empty-cells>

***show***

When this property has the value "show", borders are drawn around empty cells (like normal cells).

***hide***

A value of "hide" means that no borders are drawn around empty cells. Furthermore, if all the cells in a row have a value of "hide" and have no visible content, the entire row behaves as if it had "display: none".

In the separated borders model, this property controls the rendering of borders around cells and the rendering of the background of cells that have no visible content. Empty cells and cells with the "visibility" property set to "hidden" are considered to have no visible content. Visible content includes "&nbsp;" (non-breaking-space) and other whitespace except ASCII CR ("\0D"), LF ("\0A"), tab ("\09"), and space ("\20").

### 7.28.11. “ends-row”

XSL Definition:

<i>Value:</i>	true   false
<i>Initial:</i>	false
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

#### *true*

This cell ends a row.

#### *false*

This cell does not end a row.

Specifies whether this cell ends a row. This is only allowed for table-cells that are not in table-rows.

### 7.28.12. “number-columns-repeated”

XSL Definition:

<i>Value:</i>	<number>
<i>Initial:</i>	1
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

#### <number>

A positive integer. If a non-positive or non-integer value is provided, the value will be rounded to the nearest integer value greater than or equal to 1.

The "number-columns-repeated" property specifies the repetition of a table-column specification *n* times; with the same effect as if the fo:table-column formatting object had been repeated *n* times in the result tree. The "column-number" property, for all but the first, is the column-number of the previous one plus its value of the "number-columns-spanned" property.



This handles HTML's "colgroup" element.

### 7.28.13. “number-columns-spanned”

XSL Definition:

<i>Value:</i>	<number>
<i>Initial:</i>	1
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

**<number>**

A positive integer. If a non-positive or non-integer value is provided, the value will be rounded to the nearest integer value greater than or equal to 1.

For an fo:table-column the "number-columns-spanned" property specifies the number of columns spanned by table-cells that may use properties from this fo:table-column formatting object using the from-table-column() function.

For an fo:table-cell the "number-columns-spanned" property specifies the number of columns which this cell spans in the column-progression-direction starting with the current column.

**7.28.14. “number-rows-spanned”**

XSL Definition:

<i>Value:</i>	<number>
<i>Initial:</i>	1
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

**<number>**

A positive integer. If a non-positive or non-integer value is provided, the value will be rounded to the nearest integer value greater than or equal to 1.

The "number-rows-spanned" property specifies the number of rows which this cell spans in the row-progression-direction starting with the current row.

**7.28.15. “starts-row”**

XSL Definition:

<i>Value:</i>	true   false
<i>Initial:</i>	false
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

**true**

This cell starts a row.

**false**

This cell does not start a row.

Specifies whether this cell starts a row. This is only allowed for table-cells that are not in table-rows.



The "starts-row" and "ends-row" properties with a "true" value are typically used when the input data does not have elements containing the cells in each row, but instead, for example, each row starts at elements of a particular type.

### 7.28.16. “table-layout”

CSS2 Definition:

*Value:* auto | fixed |  
inherit

*Initial:* auto

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["table-layout" property](#)

<http://www.w3.org/TR/REC-CSS2/tables.html#propdef-table-layout>

#### ***fixed***

Use the fixed table layout algorithm

#### ***auto***

Use any automatic table layout algorithm

The "table-layout" property controls the algorithm used to lay out the table cells, rows, and columns.

### 7.28.17. “table-omit-footer-at-break”

XSL Definition:

*Value:* true | false

*Initial:* false

*Inherited:* no

*Percentages:* N/A

*Media:* visual

#### ***true***

This property specifies that the footer should be omitted.

#### ***false***

This property specifies that the footer should not be omitted.

The "table-omit-footer-at-break" property specifies if a table whose last area is not at the end of an area produced by the table should end with the content of the fo:table-footer formatting object or not.

### 7.28.18. “table-omit-header-at-break”

XSL Definition:

*Value:* true | false

*Initial:* false

*Inherited:* no

*Percentages:* N/A



*Media:* visual

***true***

This property specifies that the header should be omitted.

***false***

This property specifies that the header should not be omitted.

The "table-omit-header-at-break" property specifies if a table whose first area is not at the beginning of an area produced by the table should start with the content of the fo:table-header formatting object or not.

## 7.29. Writing-mode-related Properties

The properties in this section control the setting of the inline-progression-direction, the block-progression-direction and the orientation of the glyphs that are placed on a baseline in the inline-progression-direction. The "writing-mode" property sets both the "inline-progression-direction" and the "block-progression-direction"s.

The glyph orientation properties, "glyph-orientation-horizontal" and "glyph-orientation-vertical" set the orientation of the glyph relative to the default glyph orientation. The default orientation for glyphs is with the top of the glyph oriented toward the top of the reference area of which the glyph area is a descendant; that is, the glyph orientation is the same as the reference-orientation of the reference area. Glyphs that are oriented at '90' or '-90' degrees from the reference-orientation are said to be *rotated glyphs*. Glyphs that are oriented 180 degrees from the reference-orientation are said to be *inverted glyphs*.

The "direction" property (which is controlled by the "unicode-bidi" property) only affects text in which the orientation of the glyphs is perpendicular to the dominant-baseline. For horizontal writing-modes, the "direction" property only affects character sequences that generate glyphs that are not rotated. For vertical writing-modes, the "direction" property only affects character sequences that generate glyphs that are rotated.

The following sample fragment of XML is used to illustrate the interaction between the "writing-mode," "direction" and "glyph-orientation-vertical" properties.

```
<t> 国
      <t-s1>Apex</t-s1>
      <t-s2>אבגד</t-s2>美
</t>
```

**Markup of text in the next figure**

In the XML markup of the figure above, the characters are represented by their presentation form (and not their Unicode code points). The order in which the characters are depicted is their storage order. The Hebrew characters in the third line are (from left to right) the first four letters of the Hebrew alphabet: aleph, beth, gimel and dalet. The generic identifiers in the XML markup are arbitrary, but are intended to suggest a sequence of text with two embedded text spans.



**Table: Properties that produce the above figure**

Elements/ Cases	<t>	<t-s1>	<t-s2>
(2)	writing-mode: tb-rl glyph-orientation-vertical: 0	glyph-orientation-vertical: 90	glyph-orientation-vertical: 90
(3)	writing-mode: tb-rl glyph-orientation-vertical: 0	glyph-orientation-vertical: 90	glyph-orientation-vertical: -90 unicode-bidi: bidi-override direction: ltr
(4)	writing-mode: tb-rl glyph-orientation-vertical: 0	glyph-orientation-vertical: -90 unicode-bidi: bidi-override direction: rtl	glyph-orientation-vertical: -90 unicode-bidi: bidi-override direction: ltr
(5)	writing-mode: tb-rl glyph-orientation-vertical: 0 direction: rtl	glyph-orientation-vertical: -90 unicode-bidi: bidi-override	glyph-orientation-vertical: 90
(6)	writing-mode: tb-rl glyph-orientation-vertical: 0 direction: rtl	glyph-orientation-vertical: -90 unicode-bidi: bidi-override	glyph-orientation-vertical: -90 unicode-bidi: bidi-override direction: ltr
(7)	writing-mode: tb-rl glyph-orientation-vertical: 0 direction: rtl	glyph-orientation-vertical: 90 unicode-bidi: embed direction: ltr	glyph-orientation-vertical: 90

1. Case (1) has no rotated text. This can occur either because "glyph-orientation-vertical" is set to "0" or because it is set to "auto" and all the characters in the string are the full width variants of the characters. If the orientation of the all glyphs is vertical, then there is no re-ordering of characters. If the "writing-mode" is set to "tb-lr" or "tb-rl" then the "direction" is set to "ltr" and correspondingly, a "writing-mode" set of "bt-lr" or "bt-rl" sets the "direction" to "rtl". Therefore, it is only necessary to explicitly set the "direction" property when it would be different than that set by setting the "writing-mode"; for example, cases (5) through (7).
2. Case (2) can either have the explicit property settings shown in the table or the "glyph-orientation-vertical" property on the <t> element can have the value "auto" and the English and Hebrew characters can be half-width characters. (Of course, there are not any half-width Hebrew characters in real Unicode.) In this case, the re-ordering of characters comes from the bi-directional character types that are assigned to each Unicode character: the Roman characters have type "L" for left to right and the Hebrew characters have type "R" for right to left.
3. Cases (5) through (7) all explicitly set the "direction" property to "rtl". This sets the paragraph embedding level for the Unicode BIDI algorithm to be right to left. Even though the "direction" property is set to "rtl", the ideographic glyphs are not re-ordered because their orientation is not perpendicular to the dominant-base-line.
4. In cases (5) and (6) for the <t-s1> element, the "unicode-bidi" property is set to override even though there is no explicit specification for the "direction" property. The inherited value of the "direction" property (which is "rtl" in this case) is used.
5. In case (7) for the <t-s1> element, the "unicode-bidi" property is set to "embed". It is not necessary to use "bidi-override" because the bi-directional character type for the content of <t-s1> is already "L". (Using the value "bidi-override" would have the same effect as the "embed", however.) The embed resets the embedding level of the content of the <t-s1> to be left to right. Even the "embed" (and the specific setting of the "unicode-bidi" property) is not needed because the bi-directional character type, "L" of the English characters is sufficient to raise the embedding level and cause them to be ordered left to right. Setting the "direction" property to "ltr" is needed if the "unicode-bidi" property is other than "normal" because the inherited value of "direction" is "rtl".

If paired punctuation characters, such as parentheses, had been included in one of the text spans, then these characters may need to be "mirrored" as described in the Unicode BIDI algorithm. Mirroring a character means reversing the direction the character faces; for example, mirroring a left parenthesis

makes it into a right parenthesis. This insures that the mirrored characters always face the text they surround.

If the "glyph-orientation" of the characters to which the glyphs correspond is "90" and the embedding level in which the characters lie is odd, then the paired glyphs need to be mirrored. Alternatively, if the "glyph-orientation" of the characters to which the glyphs correspond is "-90" and the embedding level in which the characters lie is even, then the paired glyphs need to be mirrored. In the example above, parentheses that surround the Latin text would not be mirrored in cases (2), (3) and (7), but would need to be mirrored in cases (4) through (6). Conversely, parentheses that surround the Hebrew text would not be mirrored in cases (4) through (6), but would need to be mirrored in cases (2), (3), and (7).

Within a string of vertical text, when the value of the "glyph-orientation-vertical" property is "90", then each affected glyph is rotated 90 degrees clockwise. This rotation changes the way the rotated glyph is aligned. The horizontal alignment-point of the rotated glyph is aligned with the appropriate baseline from the vertical baseline-table. The appropriate baseline is the baseline identified by the "alignment-baseline" property of the character(s) that generate the glyph area. For example, if the "alignment-baseline" property is not explicitly specified, Latin glyphs are aligned to the (vertical) "alphabetic" baseline and some Indic glyphs are aligned to the (vertical) "hanging" baseline.



If a glyph, such as a ligature or syllabic glyph, is generated from more than one character, then all those characters must have the same value for the "alignment-baseline" property.

The positions of the (vertical) baselines are chosen to insure that the rotated glyphs will not protrude too far (if at all) outside the line area for the vertical line when the "line-stacking-strategy" property has the value "line-height" or "font-height". In this case, we will say the rotated text is *well aligned* in the vertical line area.

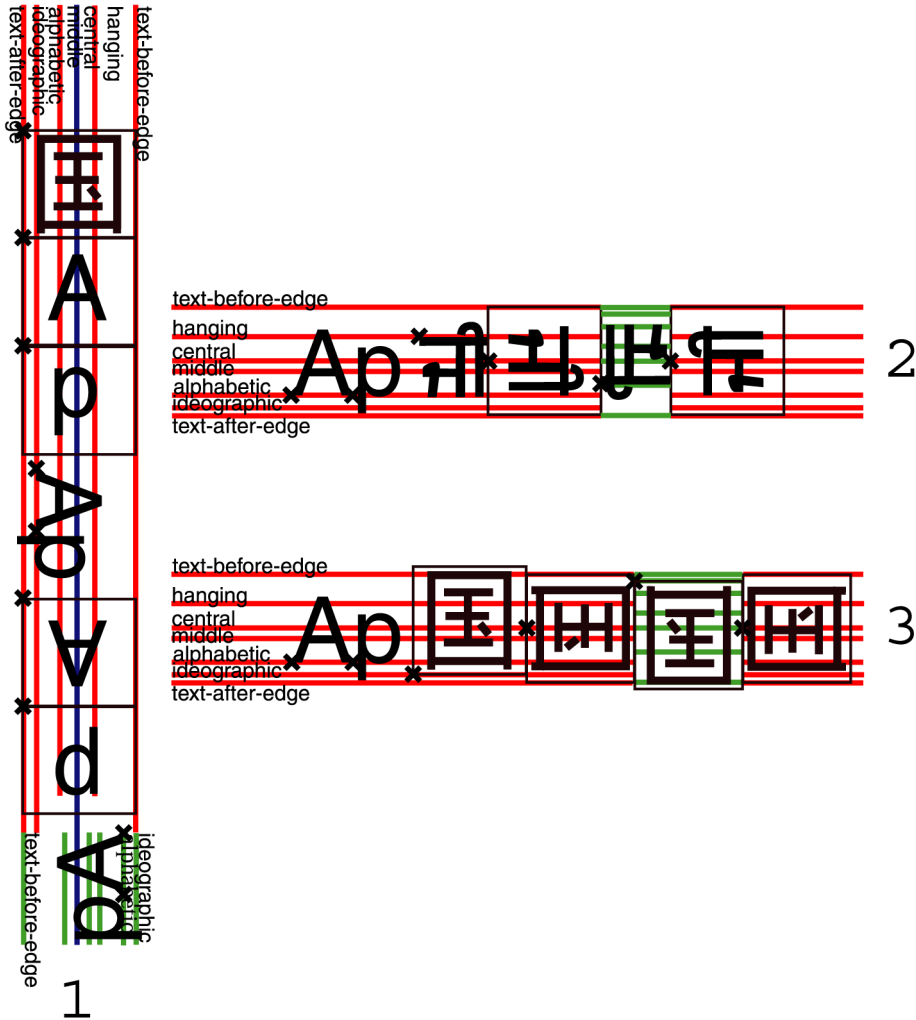
To preserve the property that rotated text in a vertical line is well aligned when the "glyph-orientation-vertical" property value is "-90", the vertical baseline-table must be *reflected* before the rotated text is aligned. Let  $C$  be the value of the offset to the "central" baseline in the baseline-table. A baseline-table is reflected by negating every offset in the baseline table (where negating "-N" yields "N") and adding 2 times  $C$  to each of the negated offsets. The "central" baseline is defined in § 7.14 – [Area Alignment Properties](#) on page 290.

This action is called "reflecting" because the offset from the original dominant baseline to any baseline in the reflected baseline-table places that baseline on the opposite side of the "central" baseline and the distance from the "central" baseline to that baseline is the same as was from the "central" baseline to that baseline in its original (un-reflected) position. In short, the positions of the baselines are reflected across the "central" baseline.



If  $X$  is the offset of baseline  $X$  and  $C$  is the offset of the "central" baseline, then  $-X+2*C = C+(C-X)$ .  $C+(C-X)$  is the offset of the "central" baseline plus the distance between the "central" baseline and baseline  $X$ , the baseline being reflected.

Reflecting is necessary, because both the "alphabetic" and the "hanging" baselines are near the outer edges of the vertical line area. If the glyph were simply rotated 180 degrees, then it would stick way out of the intended line area. This is prevented by reflecting the baselines for glyphs that are perpendicular to the dominant baseline and that are rotated 180 degrees from the direction for which that baseline was intended. This last statement applies as much to horizontal baselines as it does to vertical baselines.



The figure illustrates the positioning of rotated and inverted glyphs in both vertical and horizontal writing-modes. The three examples show first some glyphs typical of the writing mode and then some atypical glyphs in each of the possible orientations, 0, 90, 180 and -90 degrees, in that order. The alignment-point for each glyph is shown as a small "x" whose center is at the alignment-point.

Example 1 shows the "tb-rl" vertical writing-mode. It has the ideographic glyph for "country" as its normal glyph and the two letters sequence, "Ap" as the glyphs that are rotated. Note that in the default orientation (0 degrees) and in the inverted orientation, the full width Latin glyphs are used; in the two other orientations, the proportional Latin glyphs are used. There is a small amount of white space between the proportional and the full width Latin glyphs. The dominant baseline is the "central" baseline which is shown in blue. The reflected baseline table is shown for the last (-90 degree) rotation. Note that the position of the "central" baseline does not change when the baseline table is reflected. For the inverted glyphs and the glyphs with a -90 degree rotation, the start-edge of the rotated glyph is on the opposite side from where it is in the un-rotated glyph; hence, the alignment-point on that start edge is not on the edge where the font tables normally place it.

Examples 2 and 3 show the "lr-tb" horizontal writing-mode. They have the Latin glyph sequence, "Ap" as their normal glyphs. Example 2 rotates the syllabic Gurmukhi glyph for "ji" and example 3 rotates the ideographic glyph for "country". In example 2, the whole syllabic glyph is rotated as in indivisible unit. For the 90 and -90 degree rotations, the vertical alignment-point, aligning to the "central" baseline, is

used in both Examples. Similarly, for the inverted glyph, the baseline table is reflected. For the glyphs with a 90 degree rotation and the inverted glyphs, the start-edge of the rotated glyph is on the opposite side from where it is in the un-rotated glyph; hence, the alignment-point on that start edge is not on the edge where the font tables normally place it.

### 7.29.1. “direction”

CSS2 Definition:

<i>Value:</i>	ltr   rtl   inherit
<i>Initial:</i>	ltr
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["direction" property](#)

<http://www.w3.org/TR/REC-CSS2/visuren.html#propdef-direction>

This property specifies the base writing direction of blocks and the direction of embeddings and overrides (see [UNICODE UAX #9]) for the Unicode BIDI algorithm. In addition, it specifies the direction of table column layout, the direction of horizontal overflow, and the position of an incomplete last line in a block in case of 'text-align: justify'.

Values for this property have the following meanings:

**ltr** Left to right direction.

**rtl** Right to left direction.

For the 'direction' property to have any effect on inline-level elements, the 'unicode-bidi' property's value must be 'embed' or 'override'.



The 'direction' property, when specified for table column elements, is not inherited by cells in the column since columns don't exist in the document tree. Thus, CSS cannot easily capture the "dir" attribute inheritance rules described in [HTML40], section 11.3.2.1.

*XSL modifications to the CSS definition:*

- The specific use of "direction" and "unicode-bidi" on inline objects is to set the inline-progression-direction to be used by the Unicode BIDI algorithm. This direction may override the inline-progression-direction determined by the current writing-mode and the implicit direction determined by the Unicode BIDI algorithm.
- To insure consistency with the "writing-mode" property, the "direction" property is initialized to the value that sets the same inline-progression-direction as is set by the "writing-mode" property whenever that "writing-mode" property sets that direction. If the "direction" property is explicitly specified on the same formatting object the value of the "direction" property will override the inline-progression-direction set by the "writing-mode".
- This property only has an effect on text in which the orientation of the glyphs is perpendicular to the inline-progression-direction. Therefore, vertical ideographic text with the initial value for "glyph-ori-

entation-vertical" is not affected by this property; vertical text for which the "glyph-orientation-vertical" property has the value of "90" or "-90" degrees is affected.



When the inline-progression-direction is "tb", as is typical for vertical text, then this corresponds to a "lr" inline-progression-direction for text with a glyph-orientation of '90' degrees and an "rl" inline-progression-direction for text with a glyph-orientation of "-90" degrees.

- The "writing-mode" property establishes both the block-progression-direction and the inline-progression-direction. The "direction" property only changes the inline-progression-direction and is used primarily for formatting objects that generate inline-areas that are not also reference areas. Use of the "direction" property for other formatting objects is deprecated in this specification.
- When mapping CSS to XSL, the XSL "writing-mode" property should be used rather than the "direction" property for all block-level directionality control. XSL's "writing-mode" should also be used for any inline-container or block-container objects. The "direction" property should be used only for control/overrides of the Unicode BIDI algorithm on bidi-override formatting objects.

Implementations must support the values of the "direction" values defined in this Recommendation that are required to support the "writing-mode" values supported by the implementation.

### 7.29.2. “glyph-orientation-horizontal”

XSL Definition:

<i>Value:</i>	<angle>   inherit
<i>Initial:</i>	0deg
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### <angle>

The angle is restricted to 0, 90, 180, and 270 degrees. The User Agent shall round the value of the angle to the closest of the permitted values.

A value of "0deg" indicates that all glyphs are set with the top of the glyphs toward the top of the reference-area. The top of the reference-area is defined by the reference-area's *reference-orientation*.

A value of "90deg" indicates a rotation of 90-degrees clockwise from the "0deg" orientation.

This property specifies the orientation of glyphs relative to the path direction specified by the 'writing-mode'. This property is applied only to text written in a horizontal writing-mode.

The value of this property affects both the alignment and width of the glyph-areas generated for the affected glyphs. If a glyph is oriented so that it is not perpendicular to the dominant-baseline, then the vertical alignment-point of the rotated glyph is aligned with the alignment-baseline appropriate to that glyph. The baseline to which the rotated glyph is aligned is the (horizontal) baseline identified by the "alignment-baseline" for the script to which the glyph belongs. The width of the glyph-area is determined from the vertical width font characteristic for the glyph.

### 7.29.3. “glyph-orientation-vertical”

XSL Definition:

<i>Value:</i>	auto   <angle>   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### *auto*

- Fullwidth ideographic and fullwidth Latin text (excluding ideographic punctuation) will be set with a glyph-orientation of 0-degrees.

Ideographic punctuation and other ideographic characters having alternate horizontal and vertical forms will use the vertical form of the glyph.

- Text which is not fullwidth will be set with a glyph-orientation of 90-degrees.

This reorientation rule applies only to the first-level non-ideographic text. All further embedding of writing-modes or BIDI processing will be based on the first-level rotation.



- This is equivalent to having set the non-ideographic text string horizontally honoring the bidi-rule, then rotating the resultant sequence of inline-areas (one area for each change of glyph direction) 90-degrees clockwise.

It should be noted that text set in this "rotated" manner may contain ligatures or other glyph combining and reordering common to the language and script. (This "rotated" presentation form does not disable auto-ligature formation or similar context-driven variations.)

- The determination of which characters should be auto-rotated may vary across User Agents. The determination is based on a complex interaction between country, language, script, character properties, font, and character context. It is suggested that one consult the Unicode TR 11 and the various JIS or other national standards.

#### <angle>

The angle is restricted to 0, 90, 180, and 270 degrees. The User Agent shall round the value of the angle to the closest of the permitted values.

A value of "0deg" indicates that all glyphs are set with the top of the glyphs toward the top of the reference-area. The top of the reference-area is defined by the reference-area's *reference-orientation*.

A value of "90deg" indicates a rotation of 90-degrees clockwise from the "0deg" orientation.

This property specifies the orientation of glyphs relative to the path direction specified by the writing-mode. This property is applied only text written with an inline-progression-direction top-to-bottom or bottom-to-top.



Its most common usage is to differentiate between the preferred orientation of alphabetic text in vertically written Japanese documents (`glyph-orientation="auto"`) vs. the orientation of alphabetic text in western signage and advertising (`glyph-orientation="0deg"`).

The value of this property affects both the alignment and width of the glyph-areas generated for the affected glyphs. If a glyph is oriented so that it is perpendicular to the dominant-baseline, then the horizontal alignment-point of the rotated glyph is aligned with the alignment-baseline appropriate to that glyph. The baseline to which the rotated glyph is aligned is the (vertical) baseline identified by the "alignment-baseline" for the script to which the glyph belongs. The width of the glyph-area is determined from the horizontal width font characteristic for the glyph.

#### 7.29.4. “text-altitude”

XSL Definition:

<i>Value:</i>	use-font-metrics   <length>   <percentage>   inherit
<i>Initial:</i>	use-font-metrics
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to font's em-height
<i>Media:</i>	visual

Values have the following meanings:

##### *use-font-metrics*

Uses a value for the "height" of the font above the dominant baseline, calculated as the distance between the text-before baseline and the dominant baseline, obtained from the nominal font for `fo:block`, `fo:character`, and `fo:leader` when the *leader-pattern* does not have the value "use-content". For `fo:leader`, when the *leader-pattern* has the value "use-content", it is obtained from the nominal font of the first child.

Conforming implementations may choose as an actual value any value in the range of text-altitudes used by fonts of the same script and font-size, instead of the values from the font data.

##### <length>

Replaces the "height" value found in the font.

Specifies the "height" to be used for the ascent above the dominant baseline.

#### 7.29.5. “text-depth”

XSL Definition:

<i>Value:</i>	use-font-metrics   <length>   <percentage>   inherit
<i>Initial:</i>	use-font-metrics
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to font's em-height
<i>Media:</i>	visual

Values have the following meanings:

### ***use-font-metrics***

Uses a value for the "depth" of the font below the baseline, calculated as the distance between the dominant baseline and the text-after baseline, obtained from the nominal font for fo:block, fo:character, and fo:leader when the *leader-pattern* does not have the value "use-content". For fo:leader, when the *leader-pattern* has the value "use-content", it is obtained from the nominal font of the first child.

Conforming implementations may choose as an actual value any value in the range of text-depths used by fonts of the same script and font-size, instead of the values from the font data.

### **<length>**

Replaces the "depth" value found in the font.

Specifies the "depth" to be used for the descent below the dominant baseline.

## **7.29.6. “unicode-bidi”**

CSS2 Definition:

<i>Value:</i>	normal   embed   bidi-override   inherit
<i>Initial:</i>	normal
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["unicode-bidi" property](#)

<http://www.w3.org/TR/REC-CSS2/visuren.html#propdef-unicode-bidi>

Values have the following meanings:

### ***normal***

The element does not open an additional level of embedding with respect to the bidirectional algorithm.

For inline-level elements, implicit reordering works across element boundaries.

### ***embed***

If the element is inline-level, this value opens an additional level of embedding with respect to the bidirectional algorithm. The direction of this embedding level is given by the 'direction' property. Inside the element, reordering is done implicitly. This corresponds to adding a LRE (U+202A; for 'direction: ltr') or RLE (U+202B; for 'direction: rtl') at the start of the element and a PDF (U+202C) at the end of the element.

### ***bidi-override***

If the element is inline-level or a block-level element that contains only inline-level elements, this creates an override. This means that inside the element, reordering is strictly in sequence according to the 'direction' property; the implicit part of the bidirectional algorithm is ignored. This corresponds to adding a LRO (U+202D; for 'direction: ltr') or RLO (U+202E; for 'direction: rtl') at the start of the element and a PDF (U+202C) at the end of the element.

The final order of characters in each block-level element is the same as if the bidi control codes had been added as described above, markup had been stripped, and the resulting character sequence had been passed to an implementation of the Unicode bidirectional algorithm for plain text that produced the same line-breaks as the styled text. In this process, non-textual entities such as images are treated as neutral characters, unless their 'unicode-bidi' property has a value other than 'normal', in which case they are treated as strong characters in the 'direction' specified for the element.

Please note that in order to be able to flow inline boxes in a uniform direction (either entirely left-to-right or entirely right-to-left), more inline boxes (including anonymous inline boxes) may have to be created, and some inline boxes may have to be split up and reordered before flowing.

Because the Unicode algorithm has a limit of 15 levels of embedding, care should be taken not to use 'unicode-bidi' with a value other than 'normal' unless appropriate. In particular, a value of 'inherit' should be used with extreme caution. However, for elements that are, in general, intended to be displayed as blocks, a setting of 'unicode-bidi: embed' is preferred to keep the element together in case display is changed to inline.

*XSL modifications to the CSS definition:*

The phrasing of the first paragraph of the general description (following the value breakouts) should read "The final order of presentation of the characters...".

In Unicode 3.0, the Unicode Consortium has increased the limit of the levels of embedding to 61 (definition BD2 in [UNICODE UAX #9]).

Fallback:

If it is not possible to present the characters in the correct order, then the User Agent should display either a 'missing character' glyph or display some indication that the content cannot be correctly rendered.

### 7.29.7. “writing-mode”

XSL Definition:

<i>Value:</i>	lr-tb   rl-tb   tb-rl   tb-lr   bt-lr   bt-rl   lr-bt   rl-bt   lr-alternating-rl-bt   lr-alternating-rl-tb   lr-inverting-rl-bt   lr-inverting-rl-tb   tb-lr-in-lr-pairs   lr   rl   tb   inherit
<i>Initial:</i>	lr-tb
<i>Inherited:</i>	yes (see prose)
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

#### ***lr-tb***

Inline components and text within a line are written left-to-right. Lines and blocks are placed top-to-bottom.



Typically, this is the writing-mode for normal "alphabetic" text.

Establishes the following directions:

- inline-progression-direction to left-to-right

If any right-to-left reading characters are present in the text, the inline-progression-direction for glyph-areas may be further modified by the Unicode BIDI algorithm.

- block-progression-direction to top-to-bottom
- shift-direction to bottom-to-top

### ***rl-tb***

Inline components and text within a line are written right-to-left. Lines and blocks are placed top-to-bottom.



Typically, this writing mode is used in Arabic and Hebrew text.

Establishes the following directions:

- inline-progression-direction to right-to-left

If any left-to-right reading characters or numbers are present in the text, the inline-progression-direction for glyph-areas may be further modified by the Unicode BIDI algorithm.

- block-progression-direction to top-to-bottom
- shift-direction to bottom-to-top

### ***tb-rl***

Inline components and text within a line are written top-to-bottom. Lines and blocks are placed right-to-left.



Typically, this writing mode is used in Chinese and Japanese text.

Establishes the following directions:

- inline-progression-direction to top-to-bottom
- block-progression-direction to right-to-left
- shift-direction to left-to-right

### ***tb-lr***

Inline components and text within a line are stacked top-to-bottom. Lines and blocks are stacked left-to-right.

Establishes the following directions:

- inline-progression-direction to top-to-bottom
- block-progression-direction to left-to-right
- shift-direction to right-to-left

***bt-lr***

Inline components and text within a line are stacked bottom-to-top. Lines and blocks are stacked left-to-right.

Establishes the following directions:

- inline-progression-direction to bottom-to-top
- block-progression-direction to left-to-right
- shift-direction to right-to-left

***bt-rl***

Inline components and text within a line are stacked bottom-to-top. Lines and blocks are stacked right-to-left.

Establishes the following directions:

- inline-progression-direction to bottom-to-top
- block-progression-direction to right-to-left
- shift-direction to left-to-right

***lr-bt***

Inline components and text within a line are stacked left-to-right. Lines and blocks are stacked bottom-to-top.

Establishes the following directions:

- inline-progression-direction to left-to-right
- block-progression-direction to bottom-to-top
- shift-direction to bottom-to-top

***rl-bt***

Inline components and text within a line are stacked right-to-left. Lines and blocks are stacked bottom-to-top.

Establishes the following directions:

- inline-progression-direction to right-to-left
- block-progression-direction to bottom-to-top
- shift-direction to bottom-to-top

***lr-alternating-rl-bt***

Inline components and text within the first line are stacked left-to-right, within the second line they are stacked right-to-left; continuing in alternation. Lines and blocks are stacked bottom-to-top.

Establishes the following directions:

- inline-progression-direction to left-to-right for odd-numbered lines, right-to-left for even-numbered lines

- block-progression-direction to bottom-to-top
- shift-direction to bottom-to-top

### ***lr-alternating-rl-tb***

Inline components and text within the first line are stacked left-to-right, within the second line they are stacked right-to-left; continuing in alternation. Lines and blocks are stacked top-to-bottom.

Establishes the following directions:

- inline-progression-direction to left-to-right for odd-numbered lines, right-to-left for even-numbered lines
- block-progression-direction to top-to-bottom
- shift-direction to bottom-to-top

### ***lr-inverting-rl-bt***

Inline components and text within the first line are stacked left-to-right, within the second line they are inverted and are stacked right-to-left; continuing in alternation. Lines and blocks are stacked bottom-to-top.

Establishes the following directions:

- inline-progression-direction to left-to-right for odd-numbered lines, right-to-left for even-numbered lines
- block-progression-direction to bottom-to-top
- shift-direction to bottom-to-top for odd-numbered lines, top-to-bottom for even-numbered lines

### ***lr-inverting-rl-tb***

Inline components and text within the first line are stacked left-to-right, within the second line they are inverted and are stacked right-to-left; continuing in alternation. Lines and blocks are stacked top-to-bottom.

Establishes the following directions:

- inline-progression-direction to left-to-right for odd-numbered lines, right-to-left for even-numbered lines
- block-progression-direction to top-to-bottom
- shift-direction to bottom-to-top for odd-numbered lines, top-to-bottom for even-numbered lines

### ***tb-lr-in-lr-pairs***

Text is written in two character, left-to-right, pairs. The pairs are then stacked top-to-bottom to form a line. Lines and blocks are stacked left-to-right.

Establishes the following directions:

- inline-progression-direction to top-to-bottom
- block-progression-direction to left-to-right

- shift-direction to right-to-left

The two glyph areas in the pair are aligned in the inline-progression-direction in the same manner as for lines with a left-to-right inline progression direction using the "alignment-baseline", "alignment-adjust", "baseline-shift", and "dominant-baseline" properties.



Informally: the two glyph areas are placed with respect to each other vertically as if they were part of a line written left-to-right.

For stacking into lines each pair is considered a glyph area with an allocation rectangle that is the minimum rectangle required to enclose the allocation rectangles of the glyphs in the pair.

In the block-progression-direction the pairs are aligned on a line that is half-way between the end-edge of the first glyph area and the start-edge of the second glyph area in the pair.

***lr***

Shorthand for lr-tb.

***rl***

Shorthand for rl-tb.

***tb***

Shorthand for tb-rl.

The *writing-mode* trait on an area is indirectly derived from the "writing-mode" property on the formatting object that generates the area or the formatting object ancestors of that formatting object. The "writing-mode" property applies only to formatting objects that set up a reference-area. Each value of writing-mode sets all three of the direction traits indicated in each of the value descriptions above on the reference-area. (See the area model for a description of the direction traits and their usage.)



To change the "writing-mode" within an fo:flow or fo:static-content, either the fo:block-container or the fo:inline-container, as appropriate, should be used.

If one only wishes to change the inline-progression-direction to override the Unicode BIDI-rule, one need not use an fo:inline-container. Instead, one may use the "direction" property on the fo:bidirectional-override.

Implementations must support at least one of the "writing-mode" values defined in this Recommendation.

## 7.30. Miscellaneous Properties

### 7.30.1. "change-bar-class"

XSL Definition:

<i>Value:</i>	<name>
<i>Initial:</i>	none, value required
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

**<name>**

A name to allow pairing of fo:change-bar-begin and fo:change-bar-end elements.

This property associates a name with an fo:change-bar-begin or fo:change-bar-end element so that they can be matched to each other even if other fo:change-bar-begin and fo:change-bar-end elements are interspersed. This allows for "straddling pairs" of these elements.

### 7.30.2. "change-bar-color"


XSL Definition:

<i>Value:</i>	<color>
<i>Initial:</i>	the value of the color property
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

**<color>**

Specifies the color of the change bar.

 The color of any change bar is determined by the value of this property at the fo:change-bar-begin that starts the change bar; changes to this property after that do not affect the color of the change bar begin generated.

### 7.30.3. "change-bar-offset"

XSL Definition:


<i>Value:</i>	<length>
<i>Initial:</i>	6pt
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:


**<length>**

Gives the distance from the edge of the column area containing the text that is marked as changed to the center of the generated change bar.

A positive distance is directed away from the column region and into the margin regardless of the *change-bar-placement*.

 The offset of any change bar is determined by the value of this property at the fo:change-bar-begin that starts the change bar; changes to this property after that do not affect the offset of the change bar begin generated.



 Relative lengths (i.e., percentage values and lengths with units of "em") are not permitted for the value of this property.

### 7.30.4. “change-bar-placement”

XSL Definition:

<i>Value:</i>	start   end   left   right   inside   outside   alternate
<i>Initial:</i>	start
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property determines where, relative to the column areas, the change bars will occur. Values have the following meanings:

#### ***start***

The change bar will be offset from the start edge of all column areas.

#### ***end***

The change bar will be offset from the end edge of all column areas.

#### ***left***

The change bar will be offset from the left edge of all column areas.

#### ***right***

The change bar will be offset from the right edge of all column areas.

#### ***inside***


If the page binding edge is on the start-edge, the change bar will be offset from the start edge of all column areas. If the binding is the end-edge, the change bar will be offset from the end edge of all column areas. If the page binding edge is on neither the start-edge nor end-edge, the change bar will be offset from the start edge of all column areas.

#### ***outside***

If the page binding edge is on the start-edge, the change bar will be offset from the end edge of all column areas. If the binding is the end-edge, the change bar will be offset from the start edge of all column areas. If the page binding edge is on neither the start-edge nor end-edge, the change bar will be offset from the end edge of all column areas.

#### ***alternate***

When there are exactly two columns, the change bar will be offset from the start edge of all column one areas and the end edge of all column two areas; when there are any other number of columns, this value is equivalent to 'outside'.

 The placement of any change bar is determined by the value of this property at the fo:change-bar-begin that starts the change bar; changes to this property after that do not affect the placement of the change bar begin generated.

### 7.30.5. “change-bar-style”

XSL Definition:

<i>Value:</i>	<border-style>
<i>Initial:</i>	none
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the style of the change bar.

See definition of property border-top-style (§ 7.8.20 – “border-top-style” on page 259).



The style of any change bar is determined by the value of this property at the fo:change-bar-begin that starts the change bar; changes to this property after that do not affect the style of the change bar begin generated.



Conforming implementations may interpret 'dotted', 'dashed', 'double', 'groove', 'ridge', 'inset', and 'outset' to be 'solid'.

### 7.30.6. “change-bar-width”

XSL Definition:

<i>Value:</i>	<border-width>
<i>Initial:</i>	medium
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Specifies the thickness of the change bar.

Values have the following meanings:

***thin***

A thin border.

***medium***

A medium border.

***thick***

A thick border.

**<length>**

The border's thickness has an explicit value. Explicit border widths cannot be negative.



The thickness of any change bar is determined by the value of this property at the fo:change-bar-begin that starts the change bar; changes to this property after that do not affect the thickness of the change bar begin generated.



Relative lengths (i.e., percentage values and lengths with units of "em") are not permitted for the value of this property.

### 7.30.7. “content-type”

XSL Definition:

<i>Value:</i>	<string>   auto
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property specifies the content-type and may be used by a User Agent to select a rendering processor for the object.

Values for this property have the following meanings:

#### *auto*

No identification of the content-type. The User Agent may determine it by "sniffing" or by other means.

#### <string>

A specification of the content-type in terms of either a mime-type or a namespace.

A mime-type specification has the form "content-type:" followed by a mime content-type, e.g., content-type="content-type:xml/svg".

A namespace specification has the form "namespace-prefix:" followed by a declared namespace prefix, e.g., content-type="namespace-prefix:svg". If the namespace prefix is null, the content-type refers to the default namespace.

### 7.30.8. “id”

XSL Definition:

<i>Value:</i>	<id>
<i>Initial:</i>	see prose
<i>Inherited:</i>	no, see prose
<i>Percentages:</i>	N/A
<i>Media:</i>	all

Values have the following meanings:

#### <id>

An identifier unique within all objects in the result tree with the fo: namespace. It allows references to this formatting object by other objects.

The "inherit" value is not allowed on this property.

The initial value of this property is a random and unique identifier. The algorithm to generate this identifier is system-dependent.

### 7.30.9. “intrinsic-scale-value”

XSL Definition:

<i>Value:</i>	<percentage>   inherit
<i>Initial:</i>	100%
<i>Inherited:</i>	yes
<i>Percentages:</i>	user defined
<i>Media:</i>	visual

Values have the following meanings:

<*percentage*>

Specifies the scale factor.

Specifies the scale factor that the intrinsic size corresponds to.

### 7.30.10. “page-citation-strategy”

XSL Definition:

<i>Value:</i>	[ all   normal   non-blank   inherit
<i>Initial:</i>	all
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

This property determines what set of page areas are considered by a page number citation formatting object. For this property definition, an area *matches* a *ref-id* trait with value V if the area is generated either (a.) by the formatting object whose id trait is matched by V, or (b.) by any descendant of that formatting object.

A formatting object D is a *initial descendant* of another formatting object T if D is a descendant of T, the parent of D is a initial descendant of T or is T itself, and D is the initial child of that parent. Similarly, A formatting object D is a *final descendant* of another formatting object T, if D is a descendant of T, the parent of D is a final descendant of T or is T itself, and D is the final child of that parent.

Finally, a formatting object will be said to *generate a blank page* if that formatting object or any of its final descendants has a "break-after" property that causes the generation of a blank page or if its immediately following sibling or any if the sibling's initial descendants has a "break-before" property that causes the generation of a blank page or if that formatting object is an fo:page-sequence and its "force-page-count" property or the "initial-page-number" on its immediate following sibling causes the generation of a blank page.

The values have the following meanings:

***all***

The set of pages that might be cited includes the pages containing, as a descendant, any area that matches the *ref-id* trait of the formatting object on which this property appears plus any blank pages generated by the referenced formatting object.

***normal***

The set of pages that might be cited includes the pages containing, as a descendant, any normal area that matches the *ref-id* trait of the formatting object on which this property appears, and which is either returned to that formatting object or is a descendant of a normal area returned to that formatting object.

***non-blank***

The set of pages that might be cited includes the pages containing, as a descendant, any area that matches the *ref-id* trait of the formatting object on which this property appears. This set of pages includes pages containing as descendants out-of-line areas such as those generated by fo:footnote and fo:float.

**7.30.11. “provisional-label-separation”**

XSL Definition:

<i>Value:</i>	<length>   <percentage>   inherit
<i>Initial:</i>	6.0pt
<i>Inherited:</i>	yes
<i>Percentages:</i>	refer to inline-progression-dimension of closest ancestor block-area that is not a line-area
<i>Media:</i>	visual

Values have the following meanings:

**<length>**

The "provisional-label-separation" is specified as a length.

**<percentage>**

The "provisional-label-separation" is specified as a percentage of the inline-progression-dimension of the closest ancestor block-area.

Specifies the provisional distance between the end of the list-item-label and the start of the list-item-body. The value is not directly used during formatting, but is used in the computation of the value of the label-end function.

label-end() = width of the content-rectangle of the reference-area into which the list-block is placed - (the value of the provisional-distance-between-starts + the value of the start-indent + start-intrusion-adjustment - the value of the provisional-label-separation) of the closest ancestor fo:list-block.

If there is no ancestral fo:list-block, the value used for the provisional-label-separation and provisional-distance-between-starts in the above formula shall be equal to inherited-property-value(provisional-label-separation) and inherited-property-value(provisional-distance-between-starts) respectively of the FO in which the body-start() function is evaluated.

**7.30.12. “provisional-distance-between-starts”**

XSL Definition:

<i>Value:</i>	<length>   <percentage>   inherit
<i>Initial:</i>	24.0pt

<i>Inherited:</i>	yes
<i>Percentages:</i>	refer to inline-progression-dimension of closest ancestor block-area that is not a line-area
<i>Media:</i>	visual

Values have the following meanings:

**<length>**

The "provisional-distance-between-starts" is specified as a length.

**<percentage>**

The "provisional-distance-between-starts" is specified as a percentage of the inline-progression-dimension of the closest ancestor block-area.

Specifies the provisional distance between the start-indent of the list-item-label and the start-indent of the list-item-body. The value is not directly used during formatting, but is used in the computation of the value of the body-start function.

body-start() = the value of the start-indent + start-intrusion-adjustment + the value of the provisional-distance-between-starts of the closest ancestor fo:list-block.

If there is no ancestral fo:list-block, the value used for the provisional-distance-between-starts in the above formula shall be equal to inherited-property-value(provisional-distance-between-starts) of the FO in which the body-start() function is evaluated.

### 7.30.13. “ref-id”

XSL Definition:

<i>Value:</i>	<idref>   inherit
<i>Initial:</i>	none, value required
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	all

Values have the following meanings:

**<idref>**

The "id" of an object in the formatting object tree.

Reference to the object having the specified unique identifier.

### 7.30.14. “scale-option”

XSL Definition:

<i>Value:</i>	width   height   inherit
<i>Initial:</i>	width
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***width***

Requests the scale-factor applied to the width of the graphic.

***height***

Requests the scale-factor applied to the height of the graphic.

Specifies whether the scale-factor applied to the width or the height of the graphic should be retrieved.

**7.30.15. “score-spaces”**

XSL Definition:

<i>Value:</i>	true   false   inherit
<i>Initial:</i>	true
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***true***

Text-decoration will be applied to spaces

***false***

Text-decoration will not be applied to spaces

Specifies whether the text-decoration property shall be applied to spaces.

**7.30.16. “src”**

XSL Definition:

<i>Value:</i>	<uri-specification>   inherit
<i>Initial:</i>	none, value required
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

***<uri-specification>***

Specifies the URI-specification to locate an external resource such as image/graphic data to be included as the content of this object, or color-profile data.

**7.30.17. “visibility”**

CSS2 Definition:

<i>Value:</i>	visible   hidden   collapse   inherit
---------------	---------------------------------------

<i>Initial:</i>	visible
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["visibility" property](#)

<http://www.w3.org/TR/REC-CSS2/visufx.html#propdef-visibility>

The 'visibility' property specifies whether the boxes generated by an element are rendered. Invisible boxes still affect layout (set the 'display' property to 'none' to suppress box generation altogether). Values have the following meanings:

***visible***

The generated box is visible.

***hidden***

The generated box is invisible (fully transparent), but still affects layout.

***collapse***

Please consult the section on dynamic row and column effects in tables. If used on elements other than rows or columns, "collapse" has the same meaning as "hidden".

This property may be used in conjunction with scripts to create dynamic effects.

*XSL modifications to the CSS definition:*

Changed initial value to visible; (it is "inherit" in CSS) and made it an inherited property.

### 7.30.18. "z-index"

CSS2 Definition:

<i>Value:</i>	auto   <integer>   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["z-index" property](#)

<http://www.w3.org/TR/REC-CSS2/visuren.html#propdef-z-index>

For a positioned box, the "z-index" property specifies:

1. The stack level of the box in the current stacking context.
2. Whether the box establishes a local stacking context.



Values have the following meanings:

***auto***

The stack level of the generated box in the current stacking context is the same as its parent's box. The box does not establish a new local stacking context.

***<integer>***

This integer is the stack level of the generated box in the current stacking context. The box also establishes a local stacking context in which its stack level is "0".

This example [see the CSS specification] demonstrates the notion of transparency. The default behavior of a box is to allow boxes behind it to be visible through transparent areas in its content. In the example, each box transparently overlays the boxes below it. This behavior can be overridden by using one of the existing background properties.

## 7.31. Shorthand Properties

The following properties are all shorthand properties. Shorthands are only included in the highest XSL conformance level: "complete" (see § 8 – [Conformance](#) on page 436).

Shorthand properties take a list of subproperty values *or* the value "inherit". One cannot mix 'inherit' with other subproperty values as it would not be possible to specify the subproperty to which "inherit" applied.

### 7.31.1. "background"

CSS2 Definition:

<i>Value:</i>	[<background-color>    <background-image>    <background-repeat>    <background-attachment>    <background-position> ]   inherit
<i>Initial:</i>	not defined for shorthand properties
<i>Inherited:</i>	no
<i>Percentages:</i>	allowed on 'background-position'
<i>Media:</i>	visual

CSS2 Reference: ["background" property](#)

<http://www.w3.org/TR/REC-CSS2/colors.html#propdef-background>

The "background" property is a shorthand property for setting the individual background properties (i.e., background-color, background-image, background-repeat, background-attachment and background-position) at the same place in the stylesheet.

The "background" property first sets all the individual background properties to their initial values, then assigns explicit values given in the declaration.

### 7.31.2. “background-position”

CSS2 Definition:

<i>Value:</i>	[ [ <i>&lt;percentage&gt;</i>   <i>&lt;length&gt;</i> ]{1,2}   [ [top   center   bottom]    [left   center   right] ] ]   inherit
<i>Initial:</i>	0% 0%
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to the size of the box itself
<i>Media:</i>	visual

CSS2 Reference: ["background-position" property](#)

<http://www.w3.org/TR/REC-CSS2/colors.html#propdef-background-position>

If a "background-image" has been specified, this property specifies its initial position.

***<percentage>* *<percentage>***

With a value pair of 0% 0%, the upper left corner of the image is aligned with the upper left corner of the box's padding edge. A value pair of 100% 100% places the lower right corner of the image in the lower right corner of padding area. With a value pair of 14% 84%, the point 14% across and 84% down the image is to be placed at the point 14% across and 84% down the padding area.

***<length>* *<length>***

With a value pair of 2cm 2cm, the upper left corner of the image is placed 2cm to the right and 2cm below the upper left corner of the padding area.

***top left and left top***

Same as 0% 0%.

***top, top center, and center top***

Same as 50% 0%.

***right top and top right***

Same as 100% 0%.

***left, left center, and center left***

Same as 0% 50%.

***center and center center***

Same as 50% 50%.

***right, right center, and center right***

Same as 100% 50%.

***bottom left and left bottom***

Same as 0% 100%.

***bottom, bottom center, and center bottom***

Same as 50% 100%.

***bottom right and right bottom***

Same as 100% 100%.

If only one percentage or length value is given, it sets the horizontal position only, the vertical position will be 50%. If two values are given, the horizontal position comes first. Combinations of length and percentage values are allowed, (e.g., 50% 2cm). Negative positions are allowed. Keywords cannot be combined with percentage values or length values (all possible combinations are given above).

If the background image is fixed within the viewport (see the "background-attachment" property), the image is placed relative to the viewport instead of the elements padding area.

*XSL modifications to the CSS definition:*

The CSS property shall be treated as a shorthand by XSL and maps as follows:

***<percentage>***

background-position-horizontal="<percentage>"

background-position-vertical="50% "

***<percentage1> <percentage2>***

background-position-horizontal="<percentage1>"

background-position-vertical="<percentage2>"

***<length>***

background-position-horizontal="<length>"

background-position-vertical="50% "

***<length1> <length2>***

background-position-horizontal="<length1>"

background-position-vertical="<length2>"

***<length> <percentage>***

background-position-horizontal="<length>"

background-position-vertical="<percentage>"

***<percentage> <length>***

background-position-horizontal="<percentage>"

background-position-vertical="<length>"

***top left and left top***

background-position-horizontal="0% "

background-position-vertical="0% "

***top, top center, and center top***

background-position-horizontal="50% "

background-position-vertical="0% "

***right top and top right***

background-position-horizontal="100% "

background-position-vertical="0% "

***left, left center, and center left***

background-position-horizontal="0% "

background-position-vertical="50% "

***center and center center***

background-position-horizontal="50% "

background-position-vertical="50% "

***right, right center, and center right***

background-position-horizontal="100% "

background-position-vertical="50% "

***bottom left and left bottom***

background-position-horizontal="0% "

background-position-vertical="100% "

***bottom, bottom center, and center bottom***

background-position-horizontal="50% "

background-position-vertical="100% "

***bottom right and right bottom***

background-position-horizontal="100% "

background-position-vertical="100% "

### 7.31.3. "border"

CSS2 Definition:

<i>Value:</i>	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit
<i>Initial:</i>	see individual properties
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["border" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border>

The "border" property is a shorthand property for setting the same width, color, and style for all four borders, top, bottom, left, and right, of a box. Unlike the shorthand "margin" and "padding" properties, the "border" property cannot set different values on the four borders. To do so, one or more of the other border properties must be used.

*XSL modifications to the CSS definition:*

Refer to § 5.3.1 – [Border and Padding Properties](#) on page 48 for information on the precedence order of properties.

### 7.31.4. “border-bottom”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x10>

<i>Value:</i>	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit
<i>Initial:</i>	see individual properties
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["border-bottom" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-bottom>

A shorthand property for setting the width, style, and color of the bottom border of a block-area or inline-area.

### 7.31.5. “border-color”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x35>

<i>Value:</i>	[ <color>   transparent ]{1,4}   inherit
<i>Initial:</i>	see individual properties
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["border-color" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-color>

The 'border-color' property sets the color of the four borders. Values have the following meanings:

***transparent***

The border is transparent (though it may have width).

***<color>***

Any valid color specification.

The "border-color" property can have from one to four values, and the values are set on the different sides as for "border-width".

If an element's border color is not specified with a "border" property, user agents must use the value of the element's "color" property as the computed value for the border color.

*XSL modifications to the CSS definition:*

See the 'border-width' property for a description of how this property is interpreted when one through four values are provided.

### 7.31.6. “border-left”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x10>

*Value:* [ <border-width> || <border-style> || [ <color> | transparent ] ] | inherit

*Initial:* see individual properties

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-left" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-left>

A shorthand property for setting the width, style, and color of the left border of a block-area or inline-area.

### 7.31.7. “border-right”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x10>

*Value:* [ <border-width> || <border-style> || [ <color> | transparent ] ] | inherit

*Initial:* see individual properties

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-right" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-right>

A shorthand property for setting the width, style, and color of the right border of a block-area or inline-area.

### 7.31.8. “border-style”

CSS2 Definition:

*Value:* <border-style>{1,4} | inherit

*Initial:* see individual properties

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-style" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-style>

The "border-style" property sets the style of the four borders.

It can have from one to four values, and the values are set on the different sides.

*XSL modifications to the CSS definition:*

See the 'border-width' property for a description of how this property is interpreted when one through four values are provided.

### 7.31.9. "border-spacing"

CSS2 Definition:

*Value:* <length> <length>? | inherit

*Initial:* 0pt

*Inherited:* yes

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["border-spacing" property](#)

<http://www.w3.org/TR/REC-CSS2/tables.html#propdef-border-spacing>

**<length>**

The lengths specify the distance that separates adjacent cell borders. If one length is specified, it gives both the horizontal and vertical spacing. If two are specified, the first gives the horizontal spacing and the second the vertical spacing. Lengths may not be negative.

In the separate borders model, each cell has an individual border. The "border-spacing" property specifies the distance between the borders of adjacent cells. This space is filled with the background of the table element. Rows, columns, row groups, and column groups cannot have borders (i.e., user agents must ignore the border properties for those elements).

*XSL modifications to the CSS definition:*

The CSS property shall be treated as a shorthand by XSL and maps as follows:

If one value is specified the "border-separation.block-progression-direction" and "border-separation.inline-progression-direction" are both set to that value.

If two values are specified the "border-separation.block-progression-direction" is set to the second value and "border-separation.inline-progression-direction" is set to the first value.

### 7.31.10. “border-top”

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x10>

<i>Value:</i>	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit
<i>Initial:</i>	see individual properties
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["border-top" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-top>

A shorthand property for setting the width, style, and color of the top border of a block-area or inline-area.

### 7.31.11. “border-width”

CSS2 Definition:

<i>Value:</i>	<border-width>{1,4}   inherit
<i>Initial:</i>	see individual properties
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["border-width" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-border-width>

This property is a shorthand property for setting "border-top-width", "border-right-width", "border-bottom-width", and "border-left-width" at the same place in the stylesheet.

If there is only one value, it applies to all sides. If there are two values, the top and bottom borders are set to the first value and the right and left are set to the second. If there are three values, the top is set to the first value, the left and right are set to the second, and the bottom is set to the third. If there are four values, they apply to the top, right, bottom, and left, respectively.

### 7.31.12. “cue”

CSS2 Definition:

<i>Value:</i>	<cue-before>    <cue-after>   inherit
---------------	---------------------------------------



<i>Initial:</i>	not defined for shorthand properties
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	aural

CSS2 Reference: ["cue" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-cue>

### 7.31.13. "font"

CSS2 Definition:

<i>Value:</i>	[ [ <font-style>    <font-variant>    <font-weight> ]? <font-size> [ / <line-height>]? <font-family> ]   caption   icon   menu   message-box   small-caption   status-bar   inherit
<i>Initial:</i>	see individual properties
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["font" property](#)

<http://www.w3.org/TR/REC-CSS2/fonts.html#propdef-font>

The "font" property is, except as described below, a shorthand property for setting "font-style", "font-variant", "font-weight", "font-size", "line-height", and "font-family", at the same place in the stylesheet. The syntax of this property is based on a traditional typographical shorthand notation to set multiple properties related to fonts.

All font-related properties are first reset to their initial values, including those listed in the preceding paragraph plus "font-stretch" and "font-size-adjust". Then, those properties that are given explicit values in the "font" shorthand are set to those values. For a definition of allowed and initial values, see the previously defined properties. For reasons of backward compatibility, it is not possible to set "font-stretch" and "font-size-adjust" to other than their initial values using the "font" shorthand property; instead, set the individual properties.

The following [first six] values refer to system fonts:

#### ***caption***

The font used for captioned controls (e.g., buttons, drop-downs, etc.).

#### ***icon***

The font used to label icons.

#### ***menu***

The font used in menus (e.g., dropdown menus and menu lists).

#### ***message-box***

The font used in dialog boxes.

***small-caption***

The font used for labeling small controls.

***status-bar***

The font used in window status bars.

System fonts may only be set as a whole; that is, the "font-family", "size", "weight", "style", etc. are all set at the same time. These values may then be altered individually if desired. If no font with the indicated characteristics exists on a given platform, the user agent should either intelligently substitute (e.g., a smaller version of the "caption" font might be used for the "small-caption" font), or substitute a user agent default font. As for regular fonts, if, for a system font, any of the individual properties are not part of the operating system's available user preferences, those properties should be set to their initial values.

That is why this property is "almost" a shorthand property: system fonts can only be specified with this property, not with "font-family" itself, so "font" allows authors to do more than the sum of its sub-properties. However, the individual properties such as "font-weight" are still given values taken from the system font, which can be independently varied.

*XSL modifications to the CSS definition:*

In XSL the "font" property is a pure shorthand property. System font characteristics, such as font-family, and font-size, may be obtained by the use of the "system-font" function in the expression language.

**7.31.14. "margin"**

CSS2 Definition:

<i>Value:</i>	<margin-width>{1,4}   inherit
<i>Initial:</i>	not defined for shorthand properties
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["margin" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-margin>

A shorthand property for setting margin-top, margin-right, margin-bottom, and margin-left of a block-area or inline-area.

If there is only one value, it applies to all sides. If there are two values, the top and bottom margins are set to the first value and the right and left margins are set to the second. If there are three values, the top is set to the first value, the left and right are set to the second, and the bottom is set to the third. If there are four values, they apply to the top, right, bottom, and left, respectively.

*XSL modifications to the CSS definition:*

- Margin is provided for compatibility with CSS.
- Details on the mapping of CSS "margin" properties for XSL are given in [§ 5 – Property Refinement / Resolution](#) on page 44.

### 7.31.15. “padding”

CSS2 Definition:

<i>Value:</i>	<padding-width>{1,4}   inherit
<i>Initial:</i>	not defined for shorthand properties
<i>Inherited:</i>	no
<i>Percentages:</i>	refer to width of containing block
<i>Media:</i>	visual

CSS2 Reference: ["padding" property](#)

<http://www.w3.org/TR/REC-CSS2/box.html#propdef-padding>

A shorthand property for setting padding-top, padding-bottom, padding-left, and padding-right of a block-area or inline-area.

If there is only one value, it applies to all sides. If there are two values, the top and bottom paddings are set to the first value and the right and left paddings are set to the second. If there are three values, the top is set to the first value, the left and right are set to the second, and the bottom is set to the third. If there are four values, they apply to the top, right, bottom, and left, respectively.

The surface color or image of the padding area is specified via the "background" property.

### 7.31.16. “page-break-after”

CSS2 Definition:

<i>Value:</i>	auto   always   avoid   left   right   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["page-break-after" property](#)

<http://www.w3.org/TR/REC-CSS2/page.html#propdef-page-break-after>

Values for these properties have the following meanings:

***auto***

Neither force nor forbid a page break before (after, inside) the generated box.

***always***

Always force a page break before (after) the generated box.

***avoid***

Avoid a page break before (after, inside) the generated box.

***left***

Force one or two page breaks before (after) the generated box so that the next page is formatted as a left page.

***right***

Force one or two page breaks before (after) the generated box so that the next page is formatted as a right page.

A potential page break location is typically under the influence of the parent element's 'page-break-inside' property, the 'page-break-after' property of the preceding element, and the 'page-break-before' property of the following element. When these properties have values other than 'auto', the values 'always', 'left', and 'right' take precedence over 'avoid'. See the section on allowed page breaks for the exact rules on how these properties may force or suppress a page break.

*XSL modifications to the CSS definition:*

The CSS property shall be treated as a shorthand by XSL and maps as follows:

***auto***

break-after = "auto"

keep-with-next = "auto"

***always***

break-after = "page"

keep-with-next = "auto"

***avoid***

break-after = "auto"

keep-with-next = "always"

***left***

break-after = "even-page"

keep-with-next = "auto"

***right***

break-after = "odd-page"

keep-with-next = "auto"

**7.31.17. “page-break-before”**

CSS2 Definition:

<i>Value:</i>	auto   always   avoid   left   right   inherit
<i>Initial:</i>	auto
<i>Inherited:</i>	no
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["page-break-before" property](#)

<http://www.w3.org/TR/REC-CSS2/page.html#propdef-page-break-before>

Values for these properties have the following meanings:

***auto***

Neither force nor forbid a page break before (after, inside) the generated box.

***always***

Always force a page break before (after) the generated box.

***avoid***

Avoid a page break before (after, inside) the generated box.

***left***

Force one or two page breaks before (after) the generated box so that the next page is formatted as a left page.

***right***

Force one or two page breaks before (after) the generated box so that the next page is formatted as a right page.

A potential page break location is typically under the influence of the parent element's 'page-break-inside' property, the 'page-break-after' property of the preceding element, and the 'page-break-before' property of the following element. When these properties have values other than 'auto', the values 'always', 'left', and 'right' take precedence over 'avoid'. See the section on allowed page breaks for the exact rules on how these properties may force or suppress a page break.

*XSL modifications to the CSS definition:*

The CSS property shall be treated as a shorthand by XSL and maps as follows:

***auto***

break-before = "auto"

keep-with-previous = "auto"

***always***

break-before = "page"

keep-with-previous = "auto"

***avoid***

break-before = "auto"

keep-with-previous = "always"

***left***

break-before = "even-page"

keep-with-previous = "auto"

***right***

break-before = "odd-page"

keep-with-previous = "auto"

### 7.31.18. “page-break-inside”

#### CSS2 Definition:

*Value:* avoid | auto | inherit

*Initial:* auto

*Inherited:* yes

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["page-break-inside" property](#)

<http://www.w3.org/TR/REC-CSS2/page.html#propdef-page-break-inside>



The CSS definition for page-break-inside was shared with the definitions of page-break-before and page-break-after. The text here has been edited to include only the value choices valid for page-break-inside and to remove the before/after/inside triplet.

Values for this property have the following meanings:

#### **auto**

Neither force nor forbid a page break inside the generated box.

#### **avoid**

Avoid a page break inside the generated box.

A potential page break location is typically under the influence of the parent element's 'page-break-inside' property, the 'page-break-after' property of the preceding element, and the 'page-break-before' property of the following element. When these properties have values other than 'auto', values 'always', 'left', and 'right' take precedence over 'avoid'. See the section on allowed page breaks for the exact rules on how these properties may force or suppress a page break.

*XSL modifications to the CSS definition:*

XSL treats this as a shorthand and maps it as follows.

#### **auto**

keep-together = "auto"

#### **avoid**

keep-together = "always"

### 7.31.19. “pause”

#### CSS2 Definition:

*Value:* [<time> | <percentage>]{1,2} | inherit

*Initial:* depends on user agent

*Inherited:* no

*Percentages:* see descriptions of 'pause-before' and 'pause-after'

*Media:* aural

CSS2 Reference: ["pause" property](#)

<http://www.w3.org/TR/REC-CSS2/aural.html#propdef-pause>

### 7.31.20. "position"

CSS2 Definition: as amended by <http://www.w3.org/Style/css2-updates/REC-CSS2-19980512-errata.html#x11>

*Value:* static | relative | absolute | fixed | inherit

*Initial:* static

*Inherited:* no

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["position" property](#)

<http://www.w3.org/TR/REC-CSS2/visuren.html#propdef-position>

Values have the following meanings:

#### *static*

The box is a normal box, laid out according to the normal flow. The "top", "right", "bottom", and "left" properties do not apply.

#### *relative*

The box's position is calculated according to the normal flow (this is called the position in normal flow). Then the box is offset relative to its normal position. When a box B is relatively positioned, the position of the following box is calculated as though B were not offset.

#### *absolute*

The box's position (and possibly size) is specified with the "left", "right", "top", and "bottom" properties. These properties specify offsets with respect to the box's containing block. Absolutely positioned boxes are taken out of the normal flow. This means they have no impact on the layout of later siblings. Also, though absolutely positioned boxes have margins, they do not collapse with any other margins.

#### *fixed*

The box's position is calculated according to the "absolute" model, but in addition, the box is fixed with respect to some reference. In the case of continuous media, the box is fixed with respect to the viewport (and doesn't move when scrolled). In the case of paged media, the box is fixed with respect to the page, even if that page is seen through a viewport (in the case of a print-preview, for example). Authors may wish to specify "fixed" in a media-dependent way. For instance, an author may want a box to remain at the top the viewport on the screen, but not at the top of each printed page.

Specifies the positioning scheme to be used.

*XSL modifications to the CSS definition:*

The CSS property shall be treated as a shorthand by XSL and maps as follows:

***static***

relative-position="static"

absolute-position="auto"

***relative***

relative-position="relative"

absolute-position="auto"

***absolute***

relative-position="static"

absolute-position="absolute"

***fixed***

relative-position="static"

absolute-position="fixed"

### 7.31.21. "size"

CSS2 Definition:

*Value:* <length>{ 1,2} | auto | landscape | portrait | inherit

*Initial:* auto

*Inherited:* N/A [XSL:no, is optional]

*Percentages:* N/A

*Media:* visual

CSS2 Reference: ["size" property](#)

<http://www.w3.org/TR/REC-CSS2/page.html#propdef-size>

This property specifies the size and orientation of a page box.

The size of a page box may either be "absolute" (fixed size) or "relative" (scalable, i.e., fitting available sheet sizes). Relative page boxes allow user agents to scale a document and make optimal use of the target size.

[The first] Three values for the 'size' property create a relative page box:

***auto***

The page box will be set to the size and orientation of the target sheet.

***landscape***

Overrides the target's orientation. The page box is the same size as the target, and the longer sides are horizontal.



***portrait***

Overrides the target's orientation. The page box is the same size as the target, and the shorter sides are horizontal.

***<length>***

Length values for the "size" property create an absolute page box. If only one length value is specified, it sets both the width and height of the page box (i.e., the box is a square). Since the page box is the initial containing block, percentage values are not allowed for the "size" property.

User agents may allow users to control the transfer of the page box to the sheet (e.g., rotating an absolute page box that's being printed).

- Rendering page boxes that do not fit a target sheet

If a page box does not fit the target sheet dimensions, the user agent may choose to:

- Rotate the page box 90 degrees if this will make the page box fit.
- Scale the page to fit the target.

The user agent should consult the user before performing these operations.

- Positioning the page box on the sheet

When the page box is smaller than the target size, the user agent is free to place the page box anywhere on the sheet. However, it is recommended that the page box be centered on the sheet since this will align double-sided pages and avoid accidental loss of information that is printed near the edge of the sheet.

***XSL modifications to the CSS definition:***

This is treated as a CSS shorthand property that is mapped to XSL's "page-height" and "page-width" properties.

**7.31.22. "vertical-align"****CSS2 Definition:**

*Value:* baseline | middle | sub | super | text-top | text-bottom | <percentage> | <length> | top | bottom | inherit

*Initial:* baseline

*Inherited:* no

*Percentages:* refer to the 'line-height' of the element itself

*Media:* visual

CSS2 Reference: ["vertical-align" property](#)

<http://www.w3.org/TR/REC-CSS2/visudet.html#propdef-vertical-align>

This property affects the vertical positioning inside a line box of the boxes generated by an inline-level element. The following values only have meaning with respect to a parent inline-level element, or to a parent block-level element, if that element generates anonymous inline boxes; they have no effect if no such parent exists.



Values of this property have slightly different meanings in the context of tables. Please consult the section on table height algorithms for details.

Values have the following meanings:

***baseline***

Align the baseline of the box with the baseline of the parent box. If the box doesn't have a baseline, align the bottom of the box with the parent's baseline.

***middle***

Align the vertical midpoint of the box with the baseline of the parent box plus half the x-height of the parent.

***sub***

Lower the baseline of the box to the proper position for subscripts of the parent's box. (This value has no effect on the font size of the element's text.)

***super***

Raise the baseline of the box to the proper position for superscripts of the parent's box. (This value has no effect on the font size of the element's text.)

***text-top***

Align the top of the box with the top of the parent element's font.

***text-bottom***

Align the bottom of the box with the bottom of the parent element's font.

***top***

Align the top of the box with the top of the line box.

***bottom***

Align the bottom of the box with the bottom of the line box.

***<percentage>***

Raise (positive value) or lower (negative value) the box by this distance (a percentage of the "line-height" value). The value "0%" means the same as "baseline".

***<length>***

Raise (positive value) or lower (negative value) the box by this distance. The value "0cm" means the same as "baseline".



Values of this property have slightly different meanings in the context of tables. Please consult the section on table height algorithms for details.

*XSL modifications to the CSS definition:*

The CSS property shall be treated as a shorthand by XSL and maps as follows:

***baseline***

alignment-baseline="baseline"

alignment-adjust="auto"

baseline-shift="baseline"

dominant-baseline="auto"

***top***

alignment-baseline="before-edge"

alignment-adjust="auto"

baseline-shift="baseline"

dominant-baseline="auto"

***text-top***

alignment-baseline="text-before-edge"

alignment-adjust="auto"

baseline-shift="baseline"

dominant-baseline="auto"

***middle***

alignment-baseline="middle"

alignment-adjust="auto"

baseline-shift="baseline"

dominant-baseline="auto"

***bottom***

alignment-baseline="after-edge"

alignment-adjust="auto"

baseline-shift="baseline"

dominant-baseline="auto"

***text-bottom***

alignment-baseline="text-after-edge"

alignment-adjust="auto"

baseline-shift="baseline"

dominant-baseline="auto"

***sub***

alignment-baseline="baseline"

alignment-adjust="auto"

baseline-shift="sub"

dominant-baseline="auto"

***super***

alignment-baseline="baseline"

alignment-adjust="auto"

baseline-shift="super"  
 dominant-baseline="auto"

*<percentage>*

alignment-baseline="baseline"  
 alignment-adjust="<percentage>"  
 baseline-shift="baseline"  
 dominant-baseline="auto"

*<length>*

alignment-baseline="baseline"  
 alignment-adjust="<length>"  
 baseline-shift="baseline"  
 dominant-baseline="auto"

### 7.31.23. “white-space”

CSS2 Definition:

<i>Value:</i>	normal   pre   nowrap   inherit
<i>Initial:</i>	normal
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

CSS2 Reference: ["white-space" property](#)

http://www.w3.org/TR/REC-CSS2/text.html#propdef-white-space

This property declares how whitespace inside the element is handled. Values have the following meanings:

***normal***

This value directs user agents to collapse sequences of whitespace, and break lines as necessary to fill line boxes. Additional line breaks may be created by occurrences of "\A" in generated content (e.g., for the BR element in HTML).

***pre***

This value prevents user agents from collapsing sequences of whitespace. Lines are only broken at newlines in the source, or at occurrences of "\A" in generated content.

***nowrap***

This value collapses whitespace as for 'normal', but suppresses line breaks within text except for those created by "\A" in generated content (e.g., for the BR element in HTML).

Conforming user agents may ignore the 'white-space' property in author and user style sheets but must specify a value for it in the default style sheet.

*XSL modifications to the CSS definition:*

XSL splits control of white space collapsing, space and linefeed handling, and wrapping into separate properties.

The CSS property shall be treated as a shorthand by XSL and maps as follows:

***normal***

```
linefeed-treatment="treat-as-space"
white-space-collapse="true"
white-space-treatment="ignore-if-surrounding-linefeed"
wrap-option="wrap"
```

***pre***

```
linefeed-treatment="preserve"
white-space-collapse="false"
white-space-treatment="preserve"
wrap-option="no-wrap"
```

***nowrap***

```
linefeed-treatment="treat-as-space"
white-space-collapse="true"
white-space-treatment="ignore-if-surrounding-linefeed"
wrap-option="no-wrap"
```

### 7.31.24. “xml:lang”

XSL Definition:

<i>Value:</i>	<language-country>   inherit
<i>Initial:</i>	not defined for shorthand properties
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A
<i>Media:</i>	visual

Values have the following meanings:

**<string>**

A language and optionally a country specifier in conformance with [RFC3066], or its successor.

Specifies the language and country to be used by the formatter in linguistic services (such as hyphenation) and in the determination of line breaks. This affects line composition in a system-dependent way.

The string may be any RFC 3066 code.

XSL treats xml:lang as a shorthand and uses it to set the country and language properties.



In general, linguistic services (line-justification strategy, line-breaking and hyphenation) may depend on a combination of the "language", "script", and "country" properties.

## 8. Conformance

In this section the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in [RFC2119].

This specification defines three levels of conformance, in order of completeness:

### *Basic*

includes the set of formatting objects and properties needed to support a minimum level of pagination or aural rendering.

### *Extended*

includes everything else, except for shorthands. It is intended for applications whose goal is to provide sophisticated pagination.

### *Complete*

includes everything.

Conformance to this specification is expressed in terms of conformance to any of the above levels.

An application that claims conformance to a given level of this specification must implement all the formatting objects and properties that apply to it for a given medium.

[Appendix A – Formatting Object Summary](#) on page 436 specifies which formatting objects belong to each of the above levels, and for what medium.

[Appendix B – Property Summary](#) on page 441 specifies which properties belong to each of the above levels.

The minimum level of conformance is Basic. A minimally conformant implementation must process as specified all the formatting objects and properties defined for the Basic level of the implementation's target medium.

Implementations may choose to process formatting objects from levels or target media other than the one to which they conform. In order to ensure interoperability, this specification defines a fallback for each formatting object in the Extended and Complete levels.

An implementation must not claim conformance to a given level if any of the formatting objects at that level is implemented solely as the fallback specified here for that level. Correct processing of fallbacks does not constitute conformance.

Conforming implementations must support at least one of the "writing-mode" values defined in this Recommendation. Although writing-mode is defined as a Basic property with an initial value of "lr-tb", it is not the intention of this specification to impose this particular, or any other, writing mode value on conformant applications. If an implementation does not support a writing-mode used in a stylesheet, either explicitly or by relying on the initial value, it should display either a 'missing character' glyph message or display some indication that the content cannot be correctly rendered.

## Appendix A. Formatting Object Summary

This section contains tables summarizing the conformance level of each of the defined formatting objects, i.e., basic or extended. For a description of basic and extended, see [§ 8 – Conformance](#) on page 436. Included with each formatting object name is a designation of its inclusion or exclusion from

the basic set of formatting objects for the particular class. XSL defines visual and aural classes. For certain formatting objects, see [Appendix A.6 – Link and Multi Formatting Objects](#) on page 440, the visual class is subdivided into interactive and non-interactive media. A proposed fallback treatment is also specified.

## A.1. Declaration and Pagination and Layout Formatting Objects

Formatting Object	Visual	Aural
fo:root	basic	basic
fo:page-sequence	basic	basic
fo:page-sequence-wrapper	basic	basic
fo:page-sequence-master	basic	basic
fo:single-page-master-reference	basic	basic
fo:repeatable-page-master-reference	basic	basic
fo:repeatable-page-master-alternatives	extended fallback: use the page-master referenced in the first fo:conditional-page-master-reference child	extended fallback: use the page-master referenced in the first fo:conditional-page-master-reference child
fo:conditional-page-master-reference	extended fallback: use the page-master referenced in the first fo:conditional-page-master-reference child	extended fallback: use the page-master referenced in the first fo:conditional-page-master-reference child
fo:layout-master-set	basic	basic
fo:simple-page-master	basic	basic
fo:region-body	basic	basic
fo:region-before	extended fallback: include after content of body region is placed	extended fallback: include after content of body region is spoken
fo:region-after	extended fallback: include after content of body region is placed	extended fallback: include after content of body region is spoken
fo:region-start	extended fallback: include after content of body region is placed	extended fallback: include after content of body region is spoken
fo:region-end	extended fallback: include after content of body region is placed	extended fallback: include after content of body region is spoken
fo:declarations	basic	basic
fo:color-profile	extended fallback: ignore, use the sRGB fallback of the rgb-icc function	N/A
fo:flow	basic	basic
fo:static-content	extended fallback: include after content of body region is placed	extended fallback: include after content of body region is spoken
fo:title	extended fallback: include before content of body region is placed	extended fallback: include before content of body region is spoken

fo:flow-map	extended fallback: display an indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly spoken.
fo:flow-assignment	extended fallback: ignore.	extended fallback: ignore.
fo:flow-source-list	extended fallback: ignore.	extended fallback: ignore.
fo:flow-name-specifier	extended fallback: ignore.	extended fallback: ignore.
fo:flow-target-list	extended fallback: ignore.	extended fallback: ignore.
fo:region-name-specifier	extended fallback: ignore.	extended fallback: ignore.

## A.2. Block Formatting Objects

Formatting Object	Visual	Aural
fo:block	basic	basic
fo:block-container	extended fallback: display indication that content cannot be correctly rendered	basic

## A.3. Inline Formatting Objects

Formatting Object	Visual	Aural
fo:bidi-override	extended fallback: display indication that content cannot be correctly rendered.	basic
fo:character	basic	basic
fo:initial-property-set	extended fallback: ignore any properties specified on this object.	basic
fo:external-graphic	basic	basic
fo:instream-foreign-object	extended fallback: display an indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly spoken.
fo:inline	basic	basic
fo:inline-container	extended fallback: display indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly spoken.
fo:leader	basic	basic
fo:page-number	basic	extended fallback: speak an indication that content cannot be correctly spoken.
fo:page-number-citation	extended fallback: display an indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly spoken.



fo:page-number-citation-last	extended fallback: display an indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly spoken.
fo:folio-prefix	extended fallback: display an indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly spoken.
fo:folio-suffix	extended fallback: display an indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly spoken.
fo:scaling-value-citation	extended fallback: display indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly rendered.

## A.4. Table Formatting Objects

Formatting Object	Visual	Aural
fo:table-and-caption	basic	basic
fo:table	basic	basic
fo:table-column	basic	basic
fo:table-caption	extended fallback: <ul style="list-style-type: none"> <li>caption-side="start" becomes caption-side="before"</li> <li>caption-side="end" becomes caption-side="after"</li> <li>caption-side="left" becomes caption-side="before"</li> <li>caption-side="right" becomes caption-side="after"</li> </ul>	extended fallback: <ul style="list-style-type: none"> <li>caption-side="start" becomes caption-side="before"</li> <li>caption-side="end" becomes caption-side="after"</li> <li>caption-side="left" becomes caption-side="before"</li> <li>caption-side="right" becomes caption-side="after"</li> </ul>
fo:table-header	basic	basic
fo:table-footer	extended fallback: place at end of table.	extended fallback: speak at end of table
fo:table-body	basic	basic
fo:table-row	basic	basic
fo:table-cell	basic	basic

## A.5. List Formatting Objects

Formatting Object	Visual	Aural
fo:list-block	basic	basic
fo:list-item	basic	basic
fo:list-item-body	basic	basic
fo:list-item-label	extended fallback: labels that break across multiple lines are treated as separate blocks before list-item-body.	basic

## A.6. Link and Multi Formatting Objects

Formatting Object	Visual	Aural
fo:basic-link	extended fallback: promote content to parent formatting object.	extended fallback: promote content to parent formatting object.
fo:multi-switch	extended, need not be implemented for extended conformance for non-interactive media fallback for basic conformance and extended conformance for non-interactive media: utilize the contents of the first eligible multi-case formatting object.	extended fallback: utilize the contents of the first eligible multi-case formatting object.
fo:multi-case	basic: needed as wrapper for fallback for multi-switch	basic: needed as wrapper for fallback for multi-switch
fo:multi-toggle	extended, need not be implemented for extended conformance for non-interactive media fallback for basic conformance and extended conformance for non-interactive media: promote content to parent formatting object.	extended fallback: promote content to parent formatting object.
fo:multi-properties	extended, need not be implemented for extended conformance for non-interactive media fallback for basic conformance and extended conformance for non-interactive media: promote content to parent formatting object.	extended fallback: promote content to parent formatting object.
fo:multi-property-set	extended, need not be implemented for extended conformance for non-interactive media fallback for basic conformance and extended conformance for non-interactive media: ignore.	extended fallback: ignore.

## A.7. Out-of-line Formatting Objects

Formatting Object	Visual	Aural
fo:float	extended fallback: place inline.	extended fallback: place inline.
fo:footnote	extended fallback: place inline.	extended fallback: place inline.
fo:footnote-body	extended fallback: place inline.	extended fallback: place inline.

## A.8. Formatting Objects for Indexing

Formatting Object	Visual	Aural
fo:index-page-citation-list	extended fallback: display indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly rendered.
fo:index-key-reference	extended fallback: ignore.	extended fallback: ignore.
fo:index-page-number-prefix	extended fallback: ignore.	extended fallback: ignore.

fo:index-page-number-suffix	extended fallback: ignore.	extended fallback: ignore.
fo:index-page-citation-list-separator	extended fallback: ignore.	extended fallback: ignore.
fo:index-page-citation-range-separator	extended fallback: ignore.	extended fallback: ignore.
fo:index-range-begin	extended fallback: ignore.	extended fallback: ignore.
fo:index-range-end	extended fallback: ignore.	extended fallback: ignore.

## A.9. Formatting Objects for Bookmarks

Formatting Object	Visual	Aural
fo:bookmark-tree	extended fallback: display an indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly spoken.
fo:bookmark	extended fallback: ignore.	extended fallback: ignore.
fo:bookmark-title	extended fallback: ignore.	extended fallback: ignore.

## A.10. Other Formatting Objects

Formatting Object	Visual	Aural
fo:change-bar-begin	extended fallback: ignore.	extended fallback: ignore.
fo:change-bar-end	extended fallback: ignore.	extended fallback: ignore.
fo:wrapper	basic	basic
fo:marker	extended fallback: ignore.	extended fallback: ignore.
fo:retrieve-marker	extended fallback: display indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly rendered.
fo:retrieve-table-marker	extended fallback: display indication that content cannot be correctly rendered.	extended fallback: speak an indication that content cannot be correctly rendered.

# Appendix B. Property Summary

## B.1. Explanation of Trait Mapping Values

### Rendering

Maps directly into a rendering trait of the same name.

***Disappears***

There is no trait mapping.

***Shorthand***

A shorthand that is mapped into one or more properties. There are no traits associated with a shorthand property. The traits are associated with the individual properties.

***Refine***

Disappears in refinement. During refinement it sets up one or more other traits.

***Formatting***

Maps directly into a formatting trait of the same name.

***Specification***

Sub-class of formatting. It is the same as a formatting trait, but is specified on formatting objects that are referenced.

***See prose***

Used to calculate a formatting trait, which does not have the same name as the property. Other properties may also influence the trait value. See the property description for details.

***Font selection***

Property that participates in font selection.

***Value change***

Maps to a trait of the same name, but the value is not just copied.

***Reference***

An association between two names. Establishes a reference within the formatting object tree.

***Action***

Behavior trait.

***Magic***

Handled by the formatter in an implementation-defined way. There are no specific traits for this property.

**B.2. Property Table: Part I**

Name	Values	Initial Value	Inherited	Percentages
“absolute-position”	auto   absolute   fixed   inherit	auto	no	N/A
“active-state”	link   visited   active   hover   focus	no, a value is required	no	N/A
“alignment-adjust”	auto   baseline   before-edge   text-before-edge   middle   central   after-edge   text-after-edge   ideographic   alphabetic   hanging   mathematical   <percentage>   <length>   inherit	auto	no	see prose

Name	Values	Initial Value	Inherited	Percentages
“alignment-baseline”	auto   baseline   before-edge   text-before-edge   middle   central   after-edge   text-after-edge   ideographic   alphabetic   hanging   mathematical   inherit	auto	no	N/A
“allowed-height-scale”	[ any   <percentage> ]*   inherit	any	yes	intrinsic height
“allowed-width-scale”	[ any   <percentage> ]*   inherit	any	yes	intrinsic width
“auto-restore”	true   false	false	yes	N/A
“azimuth”	<angle>   [[ left-side   far-left   left   center-left   center   center-right   right   far-right   right-side ]    behind ]   leftwards   rightwards   inherit	center	yes	N/A
“background”	[ <background-color>    <background-image>    <background-repeat>    <background-attachment>    <background-position> ]   inherit	not defined for shorthand properties	no	allowed on 'background-position'
“background-attachment”	scroll   fixed   inherit	scroll	no	N/A
“background-color”	<color>   transparent   inherit	transparent	no	N/A
“background-image”	<uri-specification>   none   inherit	none	no	N/A
“background-position”	[ [ <percentage>   <length> ] { 1,2 }   [ [ top   center   bottom ]    [ left   center   right ] ] ]   inherit	0% 0%	no	refer to the size of the box itself
“background-position-horizontal”	<percentage>   <length>   left   center   right   inherit	0%	no	refer to the size of the padding-rectangle
“background-position-vertical”	<percentage>   <length>   top   center   bottom   inherit	0%	no	refer to the size of the padding-rectangle
“background-repeat”	repeat   repeat-x   repeat-y   no-repeat   inherit	repeat	no	N/A
“baseline-shift”	baseline   sub   super   <percentage>   <length>   inherit	baseline	no	refers to the "line-height" of the parent area
“blank-or-not-blank”	blank   not-blank   any   inherit	any	no	N/A
“block-progression-dimension”	auto   <length>   <percentage>   <length-range>   inherit	auto	no	see prose
“border”	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit	see individual properties	no	N/A
“border-after-color”	<color>   transparent   inherit	the value of the 'color' property	no	N/A

Name	Values	Initial Value	Inherited	Percentages
“border-after-precedence”	force   <integer>   inherit	fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0	no	N/A
“border-after-style”	<border-style>   inherit	none	no	N/A
“border-after-width”	<border-width>   <length-conditional>   inherit	medium	no	N/A
“border-before-color”	<color>   transparent   inherit	the value of the 'color' property	no	N/A
“border-before-precedence”	force   <integer>   inherit	fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0	no	N/A
“border-before-style”	<border-style>   inherit	none	no	N/A
“border-before-width”	<border-width>   <length-conditional>   inherit	medium	no	N/A
“border-bottom”	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit	see individual properties	no	N/A
“border-bottom-color”	<color>   transparent   inherit	the value of the 'color' property	no	N/A
“border-bottom-style”	<border-style>   inherit	none	no	N/A
“border-bottom-width”	<border-width>   inherit	medium	no	N/A
“border-collapse”	collapse   collapse-with-precedence   separate   inherit	collapse	yes	N/A
“border-color”	[ <color>   transparent ]{1,4}   inherit	see individual properties	no	N/A
“border-end-color”	<color>   transparent   inherit	the value of the 'color' property	no	N/A
“border-end-precedence”	force   <integer>   inherit	fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0	no	N/A
“border-end-style”	<border-style>   inherit	none	no	N/A
“border-end-width”	<border-width>   <length-conditional>   inherit	medium	no	N/A
“border-left”	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit	see individual properties	no	N/A
“border-left-color”	<color>   transparent   inherit	the value of the 'color' property	no	N/A
“border-left-style”	<border-style>   inherit	none	no	N/A
“border-left-width”	<border-width>   inherit	medium	no	N/A

Name	Values	Initial Value	Inherited	Percentages
“border-right”	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit	see individual properties	no	N/A
“border-right-color”	<color>   transparent   inherit	the value of the 'color' property	no	N/A
“border-right-style”	<border-style>   inherit	none	no	N/A
“border-right-width”	<border-width>   inherit	medium	no	N/A
“border-separation”	<length-bp-ip-direction>   inherit	.block-progression-direction="0pt" .inline-progression-direction="0pt"	yes	N/A
“border-spacing”	<length> <length>?   inherit	0pt	yes	N/A
“border-start-color”	<color>   transparent   inherit	the value of the 'color' property	no	N/A
“border-start-precedence”	force   <integer>   inherit	fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0	no	N/A
“border-start-style”	<border-style>   inherit	none	no	N/A
“border-start-width”	<border-width>   <length-conditional>   inherit	medium	no	N/A
“border-style”	<border-style>{ 1,4 }   inherit	see individual properties	no	N/A
“border-top”	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit	see individual properties	no	N/A
“border-top-color”	<color>   transparent   inherit	the value of the 'color' property	no	N/A
“border-top-style”	<border-style>   inherit	none	no	N/A
“border-top-width”	<border-width>   inherit	medium	no	N/A
“border-width”	<border-width>{ 1,4 }   inherit	see individual properties	no	N/A
“bottom”	<length>   <percentage>   auto   inherit	auto	no	refer to height of containing block
“break-after”	auto   column   page   even-page   odd-page   inherit	auto	no	N/A
“break-before”	auto   column   page   even-page   odd-page   inherit	auto	no	N/A
“caption-side”	before   after   start   end   top   bottom   left   right   inherit	before	yes	N/A
“case-name”	<name>	none, a value is required	no, a value is required	N/A
“case-title”	<string>	none, a value is required	no, a value is required	N/A
“change-bar-class”	<name>	none, value required	no	N/A
“change-bar-color”	<color>	the value of the color property	yes	N/A
“change-bar-offset”	<length>	6pt	yes	N/A

Name	Values	Initial Value	Inherited	Percentages
“change-bar-placement”	start   end   left   right   inside   outside   alternate	start	yes	N/A
“change-bar-style”	<border-style>	none	yes	N/A
“change-bar-width”	<border-width>	medium	yes	N/A
“character”	<character>	N/A, value is required	no, a value is required	N/A
“clear”	start   end   left   right   inside   outside   both   none   inherit	none	no	N/A
“clip”	<shape>   auto   inherit	auto	no	N/A
“color”	<color>   inherit	depends on user agent	yes	N/A
“color-profile-name”	<name>   inherit	N/A, value is required	no	N/A
“column-count”	<number>   inherit	1	no	N/A
“column-gap”	<length>   <percentage>   inherit	12.0pt	no	refer to width of the region being divided into columns.
“column-number”	<number>	see prose	no	N/A
“column-width”	<length>   <percentage>	see prose	no	refer to width of table
“content-height”	auto   scale-to-fit   scale-down-to-fit   scale-up-to-fit   <length>   <percentage>   inherit	auto	no	intrinsic height
“content-type”	<string>   auto	auto	no	N/A
“content-width”	auto   scale-to-fit   scale-down-to-fit   scale-up-to-fit   <length>   <percentage>   inherit	auto	no	intrinsic width
“country”	none   <country>   inherit	none	yes	N/A
“cue”	<cue-before>    <cue-after>   inherit	not defined for shorthand properties	no	N/A
“cue-after”	<uri-specification>   none   inherit	none	no	N/A
“cue-before”	<uri-specification>   none   inherit	none	no	N/A
“destination-placement-off-set”	<length>	Opt	no	N/A
“direction”	ltr   rtl   inherit	ltr	yes	N/A
“display-align”	auto   before   center   after   inherit	auto	yes	N/A
“dominant-baseline”	auto   use-script   no-change   reset-size   ideographic   alphabetic   hanging   mathematical   central   middle   text-after-edge   text-before-edge   inherit	auto	no (see prose)	N/A
“elevation”	<angle>   below   level   above   higher   lower   inherit	level	yes	N/A



Name	Values	Initial Value	Inherited	Percentages
“empty-cells”	show   hide   inherit	show	yes	N/A
“end-indent”	<length>   <percentage>   inherit	0pt	yes	refer to inline-progression-dimension of containing reference-area
“ends-row”	true   false	false	no	N/A
“extent”	<length>   <percentage>   inherit	0.0pt	no	refer to the corresponding block-progression-dimension or inline-progression-dimension of the page-viewport-area.
“external-destination”	empty string   <uri-specification>	empty string	no	N/A
“float”	before   start   end   left   right   inside   outside   none   inherit	none	no	N/A
“flow-map-name”	<name>	none, a value is required	no	N/A
“flow-map-reference”	<name>	see prose	no	N/A
“flow-name”	<name>	an empty name	no, a value is required	N/A
“flow-name-reference”	<name>	none, a value is required	no	N/A
“font”	[ [ <font-style>    <font-variant>    <font-weight> ]? <font-size> [ / <line-height> ]? <font-family> ]   caption   icon   menu   message-box   small-caption   status-bar   inherit	see individual properties	yes	N/A
“font-family”	[[ <family-name>   <generic-family> ],]* [<family-name>   <generic-family>]   inherit	depends on user agent	yes	N/A
“font-selection-strategy”	auto   character-by-character   inherit	auto	yes	N/A
“font-size”	<absolute-size>   <relative-size>   <length>   <percentage>   inherit	medium	yes, the computed value is inherited	refer to parent element's font size
“font-size-adjust”	<number>   none   inherit	none	yes	N/A
“font-stretch”	normal   wider   narrower   ultra-condensed   extra-condensed   condensed   semi-condensed   semi-expanded   expanded   extra-expanded   ultra-expanded   inherit	normal	yes	N/A
“font-style”	normal   italic   oblique   backslant   inherit	normal	yes	N/A
“font-variant”	normal   small-caps   inherit	normal	yes	N/A
“font-weight”	normal   bold   bolder   lighter   100   200   300   400   500   600   700   800   900   inherit	normal	yes	N/A

Name	Values	Initial Value	Inherited	Percentages
“force-page-count”	auto   even   odd   end-on-even   end-on-odd   no-force   inherit	auto	no	N/A
“format”	<string>	1	no	N/A
“glyph-orientation-horizontal”	<angle>   inherit	0deg	yes	N/A
“glyph-orientation-vertical”	auto   <angle>   inherit	auto	yes	N/A
“grouping-separator”	<character>	no separator	no	N/A
“grouping-size”	<number>	no grouping	no	N/A
“height”	<length>   <percentage>   auto   inherit	auto	no	see prose
“hyphenate”	false   true   inherit	false	yes	N/A
“hyphenation-character”	<character>   inherit	The Unicode hyphen character U+2010	yes	N/A
“hyphenation-keep”	auto   column   page   inherit	auto	yes	N/A
“hyphenation-ladder-count”	no-limit   <number>   inherit	no-limit	yes	N/A
“hyphenation-push-character-count”	<number>   inherit	2	yes	N/A
“hyphenation-remain-character-count”	<number>   inherit	2	yes	N/A
“id”	<id>	see prose	no, see prose	N/A
“index-class”	<string>	empty string	no	N/A
“index-key”	<string>	none	no	N/A
“indicate-destination”	true   false	false	no	N/A
“initial-page-number”	auto   auto-odd   auto-even   <number>   inherit	auto	no	N/A
“inline-progression-dimension”	auto   <length>   <percentage>   <length-range>   inherit	auto	no	see prose
“internal-destination”	empty string   <idref>	empty string	no	N/A
“intrinsic-scale-value”	<percentage>   inherit	100%	yes	user defined
“intrusion-displace”	auto   none   line   indent   block   inherit	auto	yes	N/A
“keep-together”	<keep>   inherit	.within-line=auto, .within-column=auto, .within-page=auto	yes	N/A
“keep-with-next”	<keep>   inherit	.within-line=auto, .within-column=auto, .within-page=auto	no	N/A
“keep-with-previous”	<keep>   inherit	.within-line=auto, .within-column=auto, .within-page=auto	no	N/A
“language”	none   <language>   inherit	none	yes	N/A
“last-line-end-indent”	<length>   <percentage>   inherit	Opt	yes	refer to inline-progression-dimension of closest ancestor block-area that is not a line-area

Name	Values	Initial Value	Inherited	Percentages
“leader-alignment”	none   reference-area   page   inherit	none	yes	N/A
“leader-length”	<length-range>   <percentage>   inherit	leader-length.minimum=0pt, .optimum=12.0pt, .maximum=100%	yes	refer to the inline-progression-dimension of content-rectangle of parent area
“leader-pattern”	space   rule   dots   use-content   inherit	space	yes	N/A
“leader-pattern-width”	use-font-metrics   <length>   <percentage>   inherit	use-font-metrics	yes	refer to the inline-progression-dimension of content-rectangle of parent area
“left”	<length>   <percentage>   auto   inherit	auto	no	refer to width of containing block
“letter-spacing”	normal   <length>   <space>   inherit	normal	yes	N/A
“letter-value”	auto   alphabetic   traditional	auto	no	N/A
“linefeed-treatment”	ignore   preserve   treat-as-space   treat-as-zero-width-space   inherit	treat-as-space	yes	N/A
“line-height”	normal   <length>   <number>   <percentage>   <space>   inherit	normal	yes	refer to the font size of the element itself
“line-height-shift-adjustment”	consider-shifts   disregard-shifts   inherit	consider-shifts	yes	N/A
“line-stacking-strategy”	line-height   font-height   max-height   inherit	max-height	yes	N/A
“margin”	<margin-width>{1,4}   inherit	not defined for shorthand properties	no	refer to width of containing block
“margin-bottom”	<margin-width>   inherit	0pt	no	refer to width of containing block
“margin-left”	<margin-width>   inherit	0pt	no	refer to width of containing block
“margin-right”	<margin-width>   inherit	0pt	no	refer to width of containing block
“margin-top”	<margin-width>   inherit	0pt	no	refer to width of containing block
“marker-class-name”	<name>	an empty name	no, a value is required	N/A
“master-name”	<name>	an empty name	no, a value is required	N/A
“master-reference”	<name>	an empty name	no, a value is required	N/A
“max-height”	<length>   <percentage>   none   inherit	none	no	refer to height of containing block
“maximum-repeats”	<number>   no-limit   inherit	no-limit	no	N/A
“max-width”	<length>   <percentage>   none   inherit	none	no	refer to width of containing block

Name	Values	Initial Value	Inherited	Percentages
“media-usage”	auto   paginate   bounded-in-one-dimension   unbounded	auto	no	NA
“merge-pages-across-index-key-references”	merge   leave-separate	merge	yes	N/A
“merge-ranges-across-index-key-references”	merge   leave-separate	merge	yes	N/A
“merge-sequential-page-numbers”	merge   leave-separate	merge	yes	N/A
“min-height”	<length>   <percentage>   inherit	Opt	no	refer to height of containing block
“min-width”	<length>   <percentage>   inherit	depends on UA	no	refer to width of containing block
“number-columns-repeated”	<number>	1	no	N/A
“number-columns-spanned”	<number>	1	no	N/A
“number-rows-spanned”	<number>	1	no	N/A
“odd-or-even”	odd   even   any   inherit	any	no	N/A
“orphans”	<integer>   inherit	2	yes	N/A
“overflow”	visible   hidden   scroll   error-if-overflow   repeat   auto   inherit	auto	no	N/A
“padding”	<padding-width>{ 1,4 }   inherit	not defined for shorthand properties	no	refer to width of containing block
“padding-after”	<padding-width>   <length-conditional>   inherit	Opt	no	refer to width of containing block
“padding-before”	<padding-width>   <length-conditional>   inherit	Opt	no	refer to width of containing block
“padding-bottom”	<padding-width>   inherit	Opt	no	refer to width of containing block
“padding-end”	<padding-width>   <length-conditional>   inherit	Opt	no	refer to width of containing block
“padding-left”	<padding-width>   inherit	Opt	no	refer to width of containing block
“padding-right”	<padding-width>   inherit	Opt	no	refer to width of containing block
“padding-start”	<padding-width>   <length-conditional>   inherit	Opt	no	refer to width of containing block
“padding-top”	<padding-width>   inherit	Opt	no	refer to width of containing block
“page-break-after”	auto   always   avoid   left   right   inherit	auto	no	N/A
“page-break-before”	auto   always   avoid   left   right   inherit	auto	no	N/A
“page-break-inside”	avoid   auto   inherit	auto	yes	N/A
“page-citation-strategy”	[ all   normal   non-blank   inherit	all	no	N/A
“page-height”	auto   indefinite   <length>   inherit	auto	no	N/A

Name	Values	Initial Value	Inherited	Percentages
“page-number-treatment”	link   no-link	no-link	yes	N/A
“page-position”	only   first   last   rest   any   inherit	any	no	N/A
“page-width”	auto   indefinite   <length>   inherit	auto	no	N/A
“pause”	[<time>   <percentage>]{1,2}   inherit	depends on user agent	no	see descriptions of 'pause-before' and 'pause-after'
“pause-after”	<time>   <percentage>   inherit	depends on user agent	no	see prose
“pause-before”	<time>   <percentage>   inherit	depends on user agent	no	see prose
“pitch”	<frequency>   x-low   low   medium   high   x-high   inherit	medium	yes	N/A
“pitch-range”	<number>   inherit	50	yes	N/A
“play-during”	<uri-specification> mix? repeat?   auto   none   inherit	auto	no	N/A
“position”	static   relative   absolute   fixed   inherit	static	no	N/A
“precedence”	true   false   inherit	false	no	N/A
“provisional-distance-between-starts”	<length>   <percentage>   inherit	24.0pt	yes	refer to inline-progression-dimension of closest ancestor block-area that is not a line-area
“provisional-label-separation”	<length>   <percentage>   inherit	6.0pt	yes	refer to inline-progression-dimension of closest ancestor block-area that is not a line-area
“reference-orientation”	0   90   180   270   -90   -180   -270   inherit	0	no	N/A
“ref-id”	<idref>   inherit	none, value required	no	N/A
“ref-index-key”	<string>	none, value required	no	N/A
“region-name”	xsl-region-body   xsl-region-start   xsl-region-end   xsl-region-before   xsl-region-after   <name>	see prose	no, a value is required	N/A
“region-name-reference”	<name>	none, a value is required	no	N/A
“relative-align”	before   baseline   inherit	before	yes	N/A
“relative-position”	static   relative   inherit	static	no	N/A
“rendering-intent”	auto   perceptual   relative-colorimetric   saturation   absolute-colorimetric   inherit	auto	no	N/A
“retrieve-boundary”	page   page-sequence   document	page-sequence	no	N/A
“retrieve-boundary-within-table”	table   table-fragment   page	table	no	N/A

Name	Values	Initial Value	Inherited	Percentages
“retrieve-class-name”	<name>	an empty name	no, a value is required	N/A
“retrieve-position”	first-starting-within-page   first-including-carryover   last-starting-within-page   last-ending-within-page	first-starting-within-page	no	N/A
“retrieve-position-within-table”	first-starting   first-including-carryover   last-starting   last-ending	first-starting	no	N/A
“richness”	<number>   inherit	50	yes	N/A
“right”	<length>   <percentage>   auto   inherit	auto	no	refer to width of containing block
“role”	<string>   <uri-specification>   none   inherit	none	no	N/A
“rule-style”	none   dotted   dashed   solid   double   groove   ridge   inherit	solid	yes	N/A
“rule-thickness”	<length>	1.0pt	yes	N/A
“scale-option”	width   height   inherit	width	yes	N/A
“scaling”	uniform   non-uniform   inherit	uniform	no	N/A
“scaling-method”	auto   integer-pixels   resample-any-method   inherit	auto	no	N/A
“score-spaces”	true   false   inherit	true	yes	N/A
“script”	none   auto   <script>   inherit	auto	yes	N/A
“show-destination”	replace   new	replace	no	N/A
“size”	<length>{ 1,2}   auto   landscape   portrait   inherit	auto	N/A [XSL:no, is optional]	N/A
“source-document”	<uri-specification> [<uri-specification>]*   none   inherit	none	no	N/A
“space-after”	<space>   inherit	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0	no	N/A (Differs from margin-bottom in CSS)
“space-before”	<space>   inherit	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0	no	N/A (Differs from margin-top in CSS)
“space-end”	<space>   <percentage>   inherit	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0	no	refer to inline-progression-dimension of closest ancestor block-area that is not a line-area

Name	Values	Initial Value	Inherited	Percentages
“space-start”	<space>   <percentage>   inherit	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0	no	refer to inline-progression-dimension of closest ancestor block-area that is not a line-area
“span”	none   all   inherit	none	no	N/A
“speak”	normal   none   spell-out   inherit	normal	yes	N/A
“speak-header”	once   always   inherit	once	yes	N/A
“speak-numeral”	digits   continuous   inherit	continuous	yes	N/A
“speak-punctuation”	code   none   inherit	none	yes	N/A
“speech-rate”	<number>   x-slow   slow   medium   fast   x-fast   faster   slower   inherit	medium	yes	N/A
“src”	<uri-specification>   inherit	none, value required	no	N/A
“start-indent”	<length>   <percentage>   inherit	0pt	yes	refer to inline-progression-dimension of containing reference-area
“starting-state”	show   hide	show	no	N/A
“starts-row”	true   false	false	no	N/A
“stress”	<number>   inherit	50	yes	N/A
“suppress-at-line-break”	auto   suppress   retain   inherit	auto	no	N/A
“switch-to”	xsl-preceding   xsl-following   xsl-any   <name>[ <name>]*	xsl-any	no	N/A
“table-layout”	auto   fixed   inherit	auto	no	N/A
“table-omit-footer-at-break”	true   false	false	no	N/A
“table-omit-header-at-break”	true   false	false	no	N/A
“target-presentation-context”	use-target-processing-context   <uri-specification>	use-target-processing-context	no	N/A
“target-processing-context”	document-root   <uri-specification>	document-root	no	N/A
“target-stylesheet”	use-normal-stylesheet   <uri-specification>	use-normal-stylesheet	no	N/A
“text-align”	start   center   end   justify   inside   outside   left   right   <string>   inherit	start	yes	N/A
“text-align-last”	relative   start   center   end   justify   inside   outside   left   right   inherit	relative	yes	N/A
“text-altitude”	use-font-metrics   <length>   <percentage>   inherit	use-font-metrics	no	refer to font's em-height
“text-decoration”	none   [ [ underline   no-underline ]    [ overline   no-overline ]    [ line-through   no-line-through ]    [ blink   no-blink ] ]   inherit	none	no, but see prose	N/A

Name	Values	Initial Value	Inherited	Percentages
“text-depth”	use-font-metrics   <length>   <percentage>   inherit	use-font-metrics	no	refer to font's em-height
“text-indent”	<length>   <percentage>   inherit	Opt	yes	refer to width of containing block
“text-shadow”	none   [<color>    <length> <length> <length>? ,]* [<color>    <length> <length> <length>? ]   inherit	none	no, see prose	N/A
“text-transform”	capitalize   uppercase   lowercase   none   inherit	none	yes	N/A
“top”	<length>   <percentage>   auto   inherit	auto	no	refer to height of containing block
“treat-as-word-space”	auto   true   false   inherit	auto	no	N/A
“unicode-bidi”	normal   embed   bidi-override   inherit	normal	no	N/A
“vertical-align”	baseline   middle   sub   super   text-top   text-bottom   <percentage>   <length>   top   bottom   inherit	baseline	no	refer to the 'line-height' of the element itself
“visibility”	visible   hidden   collapse   inherit	visible	yes	N/A
“voice-family”	[ [<specific-voice>   <generic-voice> ], ]* [<specific-voice>   <generic-voice> ]   inherit	depends on user agent	yes	N/A
“volume”	<number>   <percentage>   silent   x-soft   soft   medium   loud   x-loud   inherit	medium	yes	refer to inherited value
“white-space”	normal   pre   nowrap   inherit	normal	yes	N/A
“white-space-collapse”	false   true   inherit	true	yes	N/A
“white-space-treatment”	ignore   preserve   ignore-if-before-linefeed   ignore-if-after-linefeed   ignore-if-surrounding-linefeed   inherit	ignore-if-surrounding-linefeed	yes	N/A
“widows”	<integer>   inherit	2	yes	N/A
“width”	<length>   <percentage>   auto   inherit	auto	no	refer to width of containing block
“word-spacing”	normal   <length>   <space>   inherit	normal	yes	N/A
“wrap-option”	no-wrap   wrap   inherit	wrap	yes	N/A
“writing-mode”	lr-tb   rl-tb   tb-rl   tb-lr   bt-lr   bt-rl   lr-bt   rl-bt   lr-alternating-rl-bt   lr-alternating-rl-tb   lr-inverting-rl-bt   lr-inverting-rl-tb   tb-lr-in-lr-pairs   lr   rl   tb   inherit	lr-tb	yes (see prose)	N/A
“xml:lang”	<language-country>   inherit	not defined for shorthand properties	yes	N/A
“z-index”	auto   <integer>   inherit	auto	no	N/A



### B.3. Property Table: Part II

The Trait Mapping Values are explained in [Appendix B.1 – Explanation of Trait Mapping Values](#) on page 441.

Name	Values	Initial Value	Trait mapping	Core
“absolute-position”	auto   absolute   fixed   inherit	auto	See prose.	Complete
“active-state”	link   visited   active   hover   focus	no, a value is required	Action	Extended. Fallback: N/A use fallback for fo:multi-properties
“alignment-adjust”	auto   baseline   before-edge   text-before-edge   middle   central   after-edge   text-after-edge   ideographic   alphabetic   hanging   mathematical   <percentage>   <length>   inherit	auto	Formatting	Basic
“alignment-baseline”	auto   baseline   before-edge   text-before-edge   middle   central   after-edge   text-after-edge   ideographic   alphabetic   hanging   mathematical   inherit	auto	Formatting	Basic
“allowed-height-scale”	[ any   <percentage> ]*   inherit	any	Formatting	Extended. Fallback: Initial value
“allowed-width-scale”	[ any   <percentage> ]*   inherit	any	Formatting	Extended. Fallback: Initial value
“auto-restore”	true   false	false	Action	Extended. Fallback: N/A use fallback for fo:multi-switch
“azimuth”	<angle>   [[ left-side   far-left   left   center-left   center   center-right   right   far-right   right-side ]   behind ]   leftwards   rightwards   inherit	center	Rendering	Basic
“background”	[ <background-color>    <background-image>    <background-repeat>    <background-attachment>    <background-position> ]   inherit	not defined for shorthand properties	Shorthand	Complete
“background-attachment”	scroll   fixed   inherit	scroll	Rendering	Extended. Fallback: Initial value
“background-color”	<color>   transparent   inherit	transparent	Rendering	Basic
“background-image”	<uri-specification>   none   inherit	none	Rendering	Extended. Fallback: Initial value
“background-position”	[ [ <percentage>   <length> ]{1,2}   [ [top   center   bottom]    [left   center   right] ] ]   inherit	0% 0%	Shorthand	Complete

Name	Values	Initial Value	Trait mapping	Core
“background-position-horizontal”	<percentage>   <length>   left   center   right   inherit	0%	Value change	Extended. Fallback: Initial value
“background-position-vertical”	<percentage>   <length>   top   center   bottom   inherit	0%	Value change	Extended. Fallback: Initial value
“background-repeat”	repeat   repeat-x   repeat-y   no-repeat   inherit	repeat	Rendering	Extended. Fallback: no-repeat
“baseline-shift”	baseline   sub   super   <percentage>   <length>   inherit	baseline	Formatting	Basic
“blank-or-not-blank”	blank   not-blank   any   inherit	any	Specification	Extended. Fallback: N/A use fallback for fo:repeatable-page-master-alternatives
“block-progression-dimension”	auto   <length>   <percentage>   <length-range>   inherit	auto	Formatting	Basic
“border”	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit	see individual properties	Shorthand	Complete
“border-after-color”	<color>   transparent   inherit	the value of the 'color' property	Rendering	Basic
“border-after-precedence”	force   <integer>   inherit	fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0	Formatting	Basic
“border-after-style”	<border-style>   inherit	none	Rendering	Basic
“border-after-width”	<border-width>   <length-conditional>   inherit	medium	Formatting and Rendering	Basic
“border-before-color”	<color>   transparent   inherit	the value of the 'color' property	Rendering	Basic
“border-before-precedence”	force   <integer>   inherit	fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0	Formatting	Basic
“border-before-style”	<border-style>   inherit	none	Rendering	Basic
“border-before-width”	<border-width>   <length-conditional>   inherit	medium	Formatting and Rendering	Basic
“border-bottom”	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit	see individual properties	Shorthand	Complete
“border-bottom-color”	<color>   transparent   inherit	the value of the 'color' property	Disappears	Basic
“border-bottom-style”	<border-style>   inherit	none	Disappears	Basic
“border-bottom-width”	<border-width>   inherit	medium	Disappears	Basic

Name	Values	Initial Value	Trait mapping	Core
“border-collapse”	collapse   collapse-with-precedence   separate   inherit	collapse	Formatting	Extended. Fallback: Initial value
“border-color”	[ <color>   transparent ]{1,4}   inherit	see individual properties	Shorthand	Complete
“border-end-color”	<color>   transparent   inherit	the value of the 'color' property	Rendering	Basic
“border-end-precedence”	force   <integer>   inherit	fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0	Formatting	Basic
“border-end-style”	<border-style>   inherit	none	Rendering	Basic
“border-end-width”	<border-width>   <length-conditional>   inherit	medium	Formatting and Rendering	Basic
“border-left”	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit	see individual properties	Shorthand	Complete
“border-left-color”	<color>   transparent   inherit	the value of the 'color' property	Disappears	Basic
“border-left-style”	<border-style>   inherit	none	Disappears	Basic
“border-left-width”	<border-width>   inherit	medium	Disappears	Basic
“border-right”	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit	see individual properties	Shorthand	Complete
“border-right-color”	<color>   transparent   inherit	the value of the 'color' property	Disappears	Basic
“border-right-style”	<border-style>   inherit	none	Disappears	Basic
“border-right-width”	<border-width>   inherit	medium	Disappears	Basic
“border-separation”	<length-bp-ip-direction>   inherit	.block-progression-direction="0pt" .inline-progression-direction="0pt"	Formatting	Extended. Fallback: Initial value
“border-spacing”	<length> <length>?   inherit	0pt	Shorthand	Complete
“border-start-color”	<color>   transparent   inherit	the value of the 'color' property	Rendering	Basic
“border-start-precedence”	force   <integer>   inherit	fo:table: 6, fo:table-cell: 5, fo:table-column: 4, fo:table-row: 3, fo:table-body: 2, fo:table-header: 1, fo:table-footer: 0	Formatting	Basic
“border-start-style”	<border-style>   inherit	none	Rendering	Basic
“border-start-width”	<border-width>   <length-conditional>   inherit	medium	Formatting and Rendering	Basic

Name	Values	Initial Value	Trait mapping	Core
“border-style”	<border-style>{1,4}   inherit	see individual properties	Shorthand	Complete
“border-top”	[ <border-width>    <border-style>    [ <color>   transparent ] ]   inherit	see individual properties	Shorthand	Complete
“border-top-color”	<color>   transparent   inherit	the value of the 'color' property	Disappears	Basic
“border-top-style”	<border-style>   inherit	none	Disappears	Basic
“border-top-width”	<border-width>   inherit	medium	Disappears	Basic
“border-width”	<border-width>{1,4}   inherit	see individual properties	Shorthand	Complete
“bottom”	<length>   <percentage>   auto   inherit	auto	Formatting	Extended. Fallback: N/A due to fallback for absolute-position, relative-position
“break-after”	auto   column   page   even-page   odd-page   inherit	auto	Formatting	Basic
“break-before”	auto   column   page   even-page   odd-page   inherit	auto	Formatting	Basic
“caption-side”	before   after   start   end   top   bottom   left   right   inherit	before	Formatting	Complete
“case-name”	<name>	none, a value is required	Action	Extended. Fallback: N/A use fallback for fo:multi-switch
“case-title”	<string>	none, a value is required	Action	Extended. Fallback: N/A use fallback for fo:multi-switch
“change-bar-class”	<name>	none, value required	Reference	Extended. Fallback: N/A use fallback for fo:change-bar-begin, fo:change-bar-end
“change-bar-color”	<color>	the value of the color property	Rendering	Extended. Fallback: N/A use fallback for fo:change-bar-begin, fo:change-bar-end
“change-bar-offset”	<length>	6pt	Formatting	Extended. Fallback: N/A use fallback for fo:change-bar-begin, fo:change-bar-end
“change-bar-placement”	start   end   left   right   inside   outside   alternate	start	Formatting	Extended. Fallback: N/A use fallback for fo:change-bar-begin, fo:change-bar-end
“change-bar-style”	<border-style>	none	Rendering	Extended. Fallback: N/A use fallback for fo:change-bar-begin, fo:change-bar-end

Name	Values	Initial Value	Trait mapping	Core
“change-bar-width”	<border-width>	medium	Rendering	Extended. Fallback: N/A use fallback for fo:change-bar-begin, fo:change-bar-end
“character”	<character>	N/A, value is required	Formatting	Basic
“clear”	start   end   left   right   inside   outside   both   none   inherit	none	Formatting	Extended. Fallback: N/A use fallback for fo:float
“clip”	<shape>   auto   inherit	auto	Rendering	Extended. Fallback: Initial value
“color”	<color>   inherit	depends on user agent	Rendering	Basic
“color-profile-name”	<name>   inherit	N/A, value is required	Formatting	Extended. Fallback: N/A use fallback for fo:color-profile
“column-count”	<number>   inherit	1	Specification	Extended. Fallback: Initial value
“column-gap”	<length>   <percentage>   inherit	12.0pt	Specification	Extended. Fallback: N/A due to fallback for column-count
“column-number”	<number>	see prose	Value change	Basic
“column-width”	<length>   <percentage>	see prose	Specification	Basic
“content-height”	auto   scale-to-fit   scale-down-to-fit   scale-up-to-fit   <length>   <percentage>   inherit	auto	Formatting	Extended. Fallback: Initial value
“content-type”	<string>   auto	auto	Formatting	Extended. Fallback: Initial value
“content-width”	auto   scale-to-fit   scale-down-to-fit   scale-up-to-fit   <length>   <percentage>   inherit	auto	Formatting	Extended. Fallback: Initial value
“country”	none   <country>   inherit	none	Formatting	Extended. Fallback: Initial value
“cue”	<cue-before>    <cue-after>   inherit	not defined for shorthand properties	Shorthand	Complete
“cue-after”	<uri-specification>   none   inherit	none	Rendering	Basic
“cue-before”	<uri-specification>   none   inherit	none	Rendering	Basic
“destination-placement-off-set”	<length>	Opt	Action	Extended. Fallback: N/A use fallback for fo:basic-link
“direction”	ltr   rtl   inherit	ltr	See prose.	Basic
“display-align”	auto   before   center   after   inherit	auto	Formatting	Extended. Fallback: Initial value

Name	Values	Initial Value	Trait mapping	Core
“dominant-baseline”	auto   use-script   no-change   reset-size   ideographic   alphabetic   hanging   mathematical   central   middle   text-after-edge   text-before-edge   inherit	auto	Formatting	Basic
“elevation”	<angle>   below   level   above   higher   lower   inherit	level	Rendering	Basic
“empty-cells”	show   hide   inherit	show	Formatting	Extended. Fallback: Initial value
“end-indent”	<length>   <percentage>   inherit	0pt	Formatting	Basic
“ends-row”	true   false	false	Formatting	Extended. Fallback: Initial value
“extent”	<length>   <percentage>   inherit	0.0pt	Specification	Extended. Fallback: N/A use fallback for fo:region-before, fo:region-after, fo:region-start, and fo:region-end
“external-destination”	empty string   <uri-specification>	empty string	Action	Extended. Fallback: N/A use fallback for fo:basic-link
“float”	before   start   end   left   right   inside   outside   none   inherit	none	Formatting	Extended. Fallback: N/A use fallback for fo:float
“flow-map-name”	<name>	none, a value is required	Specification	Extended. Fallback: N/A use fallback for fo:flow-map
“flow-map-reference”	<name>	see prose	Specification	Extended. Fallback: N/A use fallback for fo:flow-map
“flow-name”	<name>	an empty name	Reference	Basic
“flow-name-reference”	<name>	none, a value is required	Specification	Extended. Fallback: N/A use fallback for fo:flow-map
“font”	[ [ <font-style>    <font-variant>    <font-weight> ]? <font-size> [ / <line-height> ]? <font-family> ]   caption   icon   menu   message-box   small-caption   status-bar   inherit	see individual properties	Shorthand	Complete
“font-family”	[[ <family-name>   <generic-family> ],]* [<family-name>   <generic-family>]   inherit	depends on user agent	Font selection	Basic
“font-selection-strategy”	auto   character-by-character   inherit	auto	Font selection	Complete

Name	Values	Initial Value	Trait mapping	Core
“font-size”	<absolute-size>   <relative-size>   <length>   <percentage>   inherit	medium	Formatting and Rendering	Basic
“font-size-adjust”	<number>   none   inherit	none	Font selection	Extended. Fallback: Initial value
“font-stretch”	normal   wider   narrower   ultra-condensed   extra-condensed   condensed   semi-condensed   semi-expanded   expanded   extra-expanded   ultra-expanded   inherit	normal	Font selection	Extended. Fallback: Initial value
“font-style”	normal   italic   oblique   backslant   inherit	normal	Font selection	Basic
“font-variant”	normal   small-caps   inherit	normal	Font selection	Basic
“font-weight”	normal   bold   bolder   lighter   100   200   300   400   500   600   700   800   900   inherit	normal	Font selection	Basic
“force-page-count”	auto   even   odd   end-on-even   end-on-odd   no-force   inherit	auto	Specification	Extended. Fallback: no-force
“format”	<string>	1	Formatting	Basic
“glyph-orientation-horizontal”	<angle>   inherit	0deg	Formatting	Extended. Fallback: Initial value
“glyph-orientation-vertical”	auto   <angle>   inherit	auto	Formatting	Extended. Fallback: Initial value
“grouping-separator”	<character>	no separator	Formatting	Extended. Fallback: no separator
“grouping-size”	<number>	no grouping	Formatting	Extended. Fallback: no grouping
“height”	<length>   <percentage>   auto   inherit	auto	Disappears	Basic
“hyphenate”	false   true   inherit	false	Formatting	Extended. Fallback: Initial value
“hyphenation-character”	<character>   inherit	The Unicode hyphen character U+2010	Formatting	Extended. Fallback: N/A due to fallback for hyphenate
“hyphenation-keep”	auto   column   page   inherit	auto	Formatting	Extended. Fallback: N/A due to fallback for hyphenate
“hyphenation-ladder-count”	no-limit   <number>   inherit	no-limit	Formatting	Extended. Fallback: N/A due to fallback for hyphenate
“hyphenation-push-character-count”	<number>   inherit	2	Formatting	Extended. Fallback: N/A due to fallback for hyphenate
“hyphenation-remain-character-count”	<number>   inherit	2	Formatting	Extended. Fallback: N/A due to fallback for hyphenate

Name	Values	Initial Value	Trait mapping	Core
“id”	<id>	see prose	Reference	Basic
“index-class”	<string>	empty string	Reference	Extended. Fallback: N/A use fallback for fo:index-page-citation-list
“index-key”	<string>	none	Reference	Extended. Fallback: N/A use fallback for fo:index-page-citation-list
“indicate-destination”	true   false	false	Action	Extended. Fallback: N/A use fallback for fo:basic-link
“initial-page-number”	auto   auto-odd   auto-even   <number>   inherit	auto	Formatting	Basic
“inline-progression-dimension”	auto   <length>   <percentage>   <length-range>   inherit	auto	Formatting	Basic
“internal-destination”	empty string   <idref>	empty string	Action	Extended. Fallback: N/A use fallback for fo:basic-link
“intrinsic-scale-value”	<percentage>   inherit	100%	Refine	Extended. Fallback: N/A use fallback for fo:scaling-value-citation
“intrusion-displace”	auto   none   line   indent   block   inherit	auto	Formatting	Extended. Fallback: none
“keep-together”	<keep>   inherit	.within-line=auto, .within-column=auto, .within-page=auto	Formatting	Extended. Fallback: Initial value
“keep-with-next”	<keep>   inherit	.within-line=auto, .within-column=auto, .within-page=auto	Formatting	Basic
“keep-with-previous”	<keep>   inherit	.within-line=auto, .within-column=auto, .within-page=auto	Formatting	Basic
“language”	none   <language>   inherit	none	Value change	Extended. Fallback: Initial value
“last-line-end-indent”	<length>   <percentage>   inherit	Opt	Formatting	Extended. Fallback: Initial value
“leader-alignment”	none   reference-area   page   inherit	none	Formatting	Extended. Fallback: Initial value
“leader-length”	<length-range>   <percentage>   inherit	leader-length.minimum=Opt, .optimum=12.0pt, .maximum=100%	Formatting	Basic
“leader-pattern”	space   rule   dots   use-content   inherit	space	Formatting	Basic



Name	Values	Initial Value	Trait mapping	Core
“leader-pattern-width”	use-font-metrics   <length>   <percentage>   inherit	use-font-metrics	Formatting	Extended. Fallback: Initial value
“left”	<length>   <percentage>   auto   inherit	auto	Formatting	Extended. Fallback: N/A due to fallback for absolute-position, relative-position
“letter-spacing”	normal   <length>   <space>   inherit	normal	Disappears	Extended. Fallback: Initial value
“letter-value”	auto   alphabetic   traditional	auto	Formatting	Basic
“linefeed-treatment”	ignore   preserve   treat-as-space   treat-as-zero-width-space   inherit	treat-as-space	Formatting	Extended. Fallback: Initial value
“line-height”	normal   <length>   <number>   <percentage>   <space>   inherit	normal	Formatting	Basic
“line-height-shift-adjustment”	consider-shifts   disregard-shifts   inherit	consider-shifts	Formatting	Extended. Fallback: Initial value
“line-stacking-strategy”	line-height   font-height   max-height   inherit	max-height	Formatting	Basic
“margin”	<margin-width>{ 1,4 }   inherit	not defined for shorthand properties	Shorthand	Complete
“margin-bottom”	<margin-width>   inherit	0pt	Disappears	Basic
“margin-left”	<margin-width>   inherit	0pt	Disappears	Basic
“margin-right”	<margin-width>   inherit	0pt	Disappears	Basic
“margin-top”	<margin-width>   inherit	0pt	Disappears	Basic
“marker-class-name”	<name>	an empty name	Formatting	Extended. Fallback: N/A use fallback for fo:marker
“master-name”	<name>	an empty name	Specification	Basic
“master-reference”	<name>	an empty name	Specification	Basic
“max-height”	<length>   <percentage>   none   inherit	none	Shorthand	Complete
“maximum-repeats”	<number>   no-limit   inherit	no-limit	Specification	Extended. Fallback: N/A use fallback for fo:repeatable-page-master-reference and fo:repeatable-page-master-alternatives
“max-width”	<length>   <percentage>   none   inherit	none	Shorthand	Complete
“media-usage”	auto   paginate   bounded-one-dimension   unbounded	auto	Formatting	Extended. Fallback: Initial value
“merge-pages-across-index-key-references”	merge   leave-separate	merge	Specification	Extended. Fallback: N/A use fallback for fo:index-page-citation-list

Name	Values	Initial Value	Trait mapping	Core
“merge-ranges-across-index-key-references”	merge   leave-separate	merge	Specification	Extended. Fallback: N/A use fallback for fo:index-page-citation-list
“merge-sequential-page-numbers”	merge   leave-separate	merge	Specification	Extended. Fallback: N/A use fallback for fo:index-page-citation-list
“min-height”	<length>   <percentage>   inherit	0pt	Shorthand	Complete
“min-width”	<length>   <percentage>   inherit	depends on UA	Shorthand	Complete
“number-columns-repeated”	<number>	1	Specification	Basic
“number-columns-spanned”	<number>	1	Formatting	Basic
“number-rows-spanned”	<number>	1	Formatting	Basic
“odd-or-even”	odd   even   any   inherit	any	Specification	Extended. Fallback: N/A use fallback for fo:repeatable-page-master-alternatives
“orphans”	<integer>   inherit	2	Formatting	Basic
“overflow”	visible   hidden   scroll   error-if-overflow   repeat   auto   inherit	auto	Formatting	Basic
“padding”	<padding-width>{ 1,4 }   inherit	not defined for shorthand properties	Shorthand	Complete
“padding-after”	<padding-width>   <length-conditional>   inherit	Opt	Formatting and Rendering	Basic
“padding-before”	<padding-width>   <length-conditional>   inherit	Opt	Formatting and Rendering	Basic
“padding-bottom”	<padding-width>   inherit	Opt	Disappears	Basic
“padding-end”	<padding-width>   <length-conditional>   inherit	Opt	Formatting and Rendering	Basic
“padding-left”	<padding-width>   inherit	Opt	Disappears	Basic
“padding-right”	<padding-width>   inherit	Opt	Disappears	Basic
“padding-start”	<padding-width>   <length-conditional>   inherit	Opt	Formatting and Rendering	Basic
“padding-top”	<padding-width>   inherit	Opt	Disappears	Basic
“page-break-after”	auto   always   avoid   left   right   inherit	auto	Shorthand	Complete
“page-break-before”	auto   always   avoid   left   right   inherit	auto	Shorthand	Complete
“page-break-inside”	avoid   auto   inherit	auto	Shorthand	Complete
“page-citation-strategy”	[ all   normal   non-blank   inherit	all	Specification	Extended. Fallback: N/A use fallback for fo:page-number-citation-last

Name	Values	Initial Value	Trait mapping	Core
“page-height”	auto   indefinite   <length>   inherit	auto	Specification	Basic
“page-number-treatment”	link   no-link	no-link	Action	Extended. Fallback: N/A use fallback for fo:index-page-citation-list
“page-position”	only   first   last   rest   any   inherit	any	Specification	Extended. Fallback: N/A use fallback for fo:repeatable-page-master-alternatives
“page-width”	auto   indefinite   <length>   inherit	auto	Specification	Basic
“pause”	[<time>   <percentage>]{1,2}   inherit	depends on user agent	Shorthand	Complete
“pause-after”	<time>   <percentage>   inherit	depends on user agent	Rendering	Basic
“pause-before”	<time>   <percentage>   inherit	depends on user agent	Rendering	Basic
“pitch”	<frequency>   x-low   low   medium   high   x-high   inherit	medium	Rendering	Basic
“pitch-range”	<number>   inherit	50	Rendering	Basic
“play-during”	<uri-specification> mix? repeat?   auto   none   inherit	auto	Rendering	Basic
“position”	static   relative   absolute   fixed   inherit	static	Shorthand	Complete
“precedence”	true   false   inherit	false	Specification	Extended. Fallback: N/A use fallback for fo:region-before and fo:region-after
“provisional-distance-between-starts”	<length>   <percentage>   inherit	24.0pt	Specification	Basic
“provisional-label-separation”	<length>   <percentage>   inherit	6.0pt	Specification	Basic
“reference-orientation”	0   90   180   270   -90   -180   -270   inherit	0	See prose.	Extended. Fallback: Initial value
“ref-id”	<idref>   inherit	none, value required	Reference	Extended. Fallback: N/A use fallback for fo:page-number-citation
“ref-index-key”	<string>	none, value required	Reference	Extended. Fallback: N/A use fallback for fo:index-page-citation-list
“region-name”	xsl-region-body   xsl-region-start   xsl-region-end   xsl-region-before   xsl-region-after   <name>	see prose	Specification	Basic

Name	Values	Initial Value	Trait mapping	Core
“region-name-reference”	<name>	none, a value is required	Specification	Extended. Fallback: N/A use fallback for fo:flow-map
“relative-align”	before   baseline   inherit	before	Formatting	Extended. Fallback: Initial value
“relative-position”	static   relative   inherit	static	See prose.	Extended. Fallback: Initial value
“rendering-intent”	auto   perceptual   relative-colorimetric   saturation   absolute-colorimetric   inherit	auto	Formatting	Extended. Fallback: N/A use fallback for fo:color-profile
“retrieve-boundary”	page   page-sequence   document	page-sequence	Formatting	Extended. Fallback: N/A use fallback for fo:retrieve-marker
“retrieve-boundary-within-table”	table   table-fragment   page	table	Formatting	Extended. Fallback: N/A use fallback for fo:retrieve-table-marker
“retrieve-class-name”	<name>	an empty name	Formatting	Extended. Fallback: N/A use fallback for fo:retrieve-marker
“retrieve-position”	first-starting-within-page   first-including-carryover   last-starting-within-page   last-ending-within-page	first-starting-within-page	Formatting	Extended. Fallback: N/A use fallback for fo:retrieve-marker
“retrieve-position-within-table”	first-starting   first-including-carryover   last-starting   last-ending	first-starting	Formatting	Extended. Fallback: N/A use fallback for fo:retrieve-table-marker
“richness”	<number>   inherit	50	Rendering	Basic
“right”	<length>   <percentage>   auto   inherit	auto	Formatting	Extended. Fallback: N/A due to fallback for absolute-position, relative-position
“role”	<string>   <uri-specification>   none   inherit	none	Rendering	Basic
“rule-style”	none   dotted   dashed   solid   double   groove   ridge   inherit	solid	Rendering	Basic
“rule-thickness”	<length>	1.0pt	Rendering	Basic
“scale-option”	width   height   inherit	width	Refine	Extended. Fallback: N/A use fallback for fo:scaling-value-citation
“scaling”	uniform   non-uniform   inherit	uniform	Formatting	Extended. Fallback: Initial value
“scaling-method”	auto   integer-pixels   resample-any-method   inherit	auto	Formatting	Extended. Fallback: Initial value
“score-spaces”	true   false   inherit	true	Formatting	Extended. Fallback: Initial value

Name	Values	Initial Value	Trait mapping	Core
“script”	none   auto   <script>   inherit	auto	Formatting	Extended. Fallback: none
“show-destination”	replace   new	replace	Action	Extended. Fallback: N/A use fallback for fo:basic-link
“size”	<length>{1,2}   auto   landscape   portrait   inherit	auto	Shorthand	Complete
“source-document”	<uri-specification> [<uri-specification>]*   none   inherit	none	Rendering	Basic
“space-after”	<space>   inherit	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0	Formatting	Basic
“space-before”	<space>   inherit	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0	Formatting	Basic
“space-end”	<space>   <percentage>   inherit	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0	Formatting	Basic
“space-start”	<space>   <percentage>   inherit	space.minimum=0pt, .optimum=0pt, .maximum=0pt, .conditionality=discard, .precedence=0	Formatting	Basic
“span”	none   all   inherit	none	Formatting	Extended. Fallback: Initial value
“speak”	normal   none   spell-out   inherit	normal	Rendering	Basic
“speak-header”	once   always   inherit	once	Rendering	Basic
“speak-numeral”	digits   continuous   inherit	continuous	Rendering	Basic
“speak-punctuation”	code   none   inherit	none	Rendering	Basic
“speech-rate”	<number>   x-slow   slow   medium   fast   x-fast   faster   slower   inherit	medium	Rendering	Basic
“src”	<uri-specification>   inherit	none, value required	Reference	Basic
“start-indent”	<length>   <percentage>   inherit	0pt	Formatting	Basic

Name	Values	Initial Value	Trait mapping	Core
“starting-state”	show   hide	show	Action	Extended. Fallback: N/A use fallback for fo:multi-switch
“starts-row”	true   false	false	Formatting	Extended. Fallback: Initial value
“stress”	<number>   inherit	50	Rendering	Basic
“suppress-at-line-break”	auto   suppress   retain   inherit	auto	Formatting	Extended. Fallback: Initial value
“switch-to”	xsl-preceding   xsl-following   xsl-any   <name>[<name>]*	xsl-any	Action	Extended. Fallback: N/A use fallback for fo:multi-switch
“table-layout”	auto   fixed   inherit	auto	Formatting	Extended. Fallback: fixed
“table-omit-footer-at-break”	true   false	false	Formatting	Extended. Fallback: Initial value
“table-omit-header-at-break”	true   false	false	Formatting	Extended. Fallback: Initial value
“target-presentation-context”	use-target-processing-context   <uri-specification>	use-target-processing-context	Action	Extended. Fallback: N/A use fallback for fo:basic-link
“target-processing-context”	document-root   <uri-specification>	document-root	Action	Extended. Fallback: N/A use fallback for fo:basic-link
“target-stylesheet”	use-normal-stylesheet   <uri-specification>	use-normal-stylesheet	Action	Extended. Fallback: N/A use fallback for fo:basic-link
“text-align”	start   center   end   justify   inside   outside   left   right   <string>   inherit	start	Value change	Basic
“text-align-last”	relative   start   center   end   justify   inside   outside   left   right   inherit	relative	Value change	Extended. Fallback: Initial value
“text-altitude”	use-font-metrics   <length>   <percentage>   inherit	use-font-metrics	Formatting	Extended. Fallback: Initial value
“text-decoration”	none   [ [ underline   no-underline ]    [ overline   no-overline ]    [ line-through   no-line-through ]    [ blink   no-blink ] ]   inherit	none	See prose.	Extended. Fallback: Initial value
“text-depth”	use-font-metrics   <length>   <percentage>   inherit	use-font-metrics	Formatting	Extended. Fallback: Initial value
“text-indent”	<length>   <percentage>   inherit	0pt	Formatting	Basic
“text-shadow”	none   [<color>    <length> <length> <length>? ,]* [<color>    <length> <length> <length>? ]   inherit	none	Rendering	Extended. Fallback: Initial value
“text-transform”	capitalize   uppercase   lowercase   none   inherit	none	Refine	Extended. Fallback: Initial value

Name	Values	Initial Value	Trait mapping	Core
“top”	<length>   <percentage>   auto   inherit	auto	Formatting	Extended. Fallback: N/A due to fallback for absolute-position, relative-position
“treat-as-word-space”	auto   true   false   inherit	auto	Formatting	Extended. Fallback: Initial value
“unicode-bidi”	normal   embed   bidi-override   inherit	normal	Formatting	Extended. Fallback: See prose
“vertical-align”	baseline   middle   sub   super   text-top   text-bottom   <percentage>   <length>   top   bottom   inherit	baseline	Shorthand	Complete
“visibility”	visible   hidden   collapse   inherit	visible	Magic	Extended. Fallback: Initial value
“voice-family”	[[<specific-voice>   <generic-voice> ],]* [<specific-voice>   <generic-voice> ]   inherit	depends on user agent	Rendering	Basic
“volume”	<number>   <percentage>   silent   x-soft   soft   medium   loud   x-loud   inherit	medium	Rendering	Basic
“white-space”	normal   pre   nowrap   inherit	normal	Shorthand	Complete
“white-space-collapse”	false   true   inherit	true	Formatting	Extended. Fallback: Initial value
“white-space-treatment”	ignore   preserve   ignore-if-before-linefeed   ignore-if-after-linefeed   ignore-if-surrounding-linefeed   inherit	ignore-if-surrounding-linefeed	Formatting	Extended. Fallback: Initial value
“widows”	<integer>   inherit	2	Formatting	Basic
“width”	<length>   <percentage>   auto   inherit	auto	Disappears	Basic
“word-spacing”	normal   <length>   <space>   inherit	normal	Disappears	Extended. Fallback: Initial value
“wrap-option”	no-wrap   wrap   inherit	wrap	Formatting	Basic
“writing-mode”	lr-tb   rl-tb   tb-rl   tb-lr   bt-lr   bt-rl   lr-bt   rl-bt   lr-alternating-rl-bt   lr-alternating-rl-tb   lr-inverting-rl-bt   lr-inverting-rl-tb   tb-lr-in-lr-pairs   lr   rl   tb   inherit	lr-tb	See prose.	Basic
“xml:lang”	<language-country>   inherit	not defined for shorthand properties	Shorthand	Complete
“z-index”	auto   <integer>   inherit	auto	Value change	Extended. Fallback: N/A due to fallback for fo:block-container

## B.4. Properties and the FOs they apply to

For each property the formatting objects it applies to is listed. It should be noted, however, that for some formatting objects there are qualifications on applicability or values permitted.

Property `absolute-position` applies to: `fo:block-container`.

Property `active-state` applies to: `fo:multi-property-set`.

Property `alignment-adjust` applies to: `fo:character`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, and `fo:basic-link`.

Property `alignment-baseline` applies to: `fo:character`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, and `fo:basic-link`.

Property `allowed-height-scale` applies to: `fo:external-graphic`, and `fo:instream-foreign-object`.

Property `allowed-width-scale` applies to: `fo:external-graphic`, and `fo:instream-foreign-object`.

Property `auto-restore` applies to: `fo:multi-switch`.

Property `azimuth` applies to: `fo:title`, `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, `fo:basic-link`, `fo:change-bar-begin`, and `fo:change-bar-end`.

Property `background-attachment` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `background-color` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `background-image` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `background-position-horizontal` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.



Property `background-position-vertical` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `background-repeat` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `baseline-shift` applies to: `fo:character`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, and `fo:basic-link`.

Property `blank-or-not-blank` applies to: `fo:conditional-page-master-reference`.

Property `block-progression-dimension` applies to: `fo:block-container`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:table`, `fo:table-caption`, `fo:table-row`, and `fo:table-cell`.

Property `border-after-color` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-after-precedence` applies to: `fo:table`, `fo:table-column`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, and `fo:table-cell`.

Property `border-after-style` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-after-width` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-before-color` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-before-precedence` applies to: `fo:table`, `fo:table-column`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, and `fo:table-cell`.

Property `border-before-style` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-before-width` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-bottom-color` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-bottom-style` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-bottom-width` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-collapse` applies to: `fo:table`.

Property `border-end-color` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-end-precedence` applies to: `fo:table`, `fo:table-column`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, and `fo:table-cell`.

Property `border-end-style` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`,

fo:table-column, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, and fo:basic-link.

Property border-end-width applies to: fo:region-body, fo:region-before, fo:region-after, fo:region-start, fo:region-end, fo:title, fo:block, fo:block-container, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-column, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, and fo:basic-link.

Property border-left-color applies to: fo:region-body, fo:region-before, fo:region-after, fo:region-start, fo:region-end, fo:title, fo:block, fo:block-container, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-column, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, and fo:basic-link.

Property border-left-style applies to: fo:region-body, fo:region-before, fo:region-after, fo:region-start, fo:region-end, fo:title, fo:block, fo:block-container, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-column, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, and fo:basic-link.

Property border-left-width applies to: fo:region-body, fo:region-before, fo:region-after, fo:region-start, fo:region-end, fo:title, fo:block, fo:block-container, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-column, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, and fo:basic-link.

Property border-right-color applies to: fo:region-body, fo:region-before, fo:region-after, fo:region-start, fo:region-end, fo:title, fo:block, fo:block-container, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-column, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, and fo:basic-link.

Property border-right-style applies to: fo:region-body, fo:region-before, fo:region-after, fo:region-start, fo:region-end, fo:title, fo:block, fo:block-container, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-column, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, and fo:basic-link.

Property border-right-width applies to: fo:region-body, fo:region-before, fo:region-after, fo:region-start, fo:region-end, fo:title, fo:block, fo:block-container, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-column, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, and fo:basic-link.

Property border-separation applies to: fo:table.

Property `border-start-color` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-start-precedence` applies to: `fo:table`, `fo:table-column`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, and `fo:table-cell`.

Property `border-start-style` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-start-width` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-top-color` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-top-style` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `border-top-width` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-column`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `bottom` applies to: `fo:block-container`.

Property `bottom` applies to: `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property break-after applies to: fo:block, fo:block-container, fo:table-and-caption, fo:table, fo:table-row, fo:list-block, and fo:list-item.

Property break-before applies to: fo:block, fo:block-container, fo:table-and-caption, fo:table, fo:table-row, fo:list-block, and fo:list-item.

Property caption-side applies to: fo:table-and-caption.

Property case-name applies to: fo:multi-case.

Property case-title applies to: fo:multi-case.

Property change-bar-class applies to: fo:change-bar-begin, and fo:change-bar-end.

Property change-bar-color applies to: fo:change-bar-begin.

Property change-bar-offset applies to: fo:change-bar-begin.

Property change-bar-placement applies to: fo:change-bar-begin.

Property change-bar-style applies to: fo:change-bar-begin.

Property change-bar-width applies to: fo:change-bar-begin.

Property character applies to: fo:character.

Property clear applies to: fo:block, fo:block-container, fo:table-and-caption, fo:table, fo:list-block, and fo:float.

Property clip applies to: fo:region-body, fo:region-before, fo:region-after, fo:region-start, fo:region-end, fo:block-container, fo:external-graphic, fo:instream-foreign-object, and fo:inline-container.

Property color applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:inline, fo:leader, and fo:bookmark-title.

Property color-profile-name applies to: fo:color-profile.

Property column-count applies to: fo:region-body.

Property column-gap applies to: fo:region-body.

Property column-number applies to: fo:table-column, and fo:table-cell.

Property column-width applies to: fo:table-column.

Property content-height applies to: fo:external-graphic, and fo:instream-foreign-object.

Property content-type applies to: fo:external-graphic, and fo:instream-foreign-object.

Property content-width applies to: fo:external-graphic, and fo:instream-foreign-object.

Property country applies to: fo:block, and fo:character.

Property cue-after applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property cue-before applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-

caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property destination-placement-offset applies to: fo:basic-link.

Property direction applies to: fo:bidirectional-override.

Property display-align applies to: fo:region-body, fo:region-before, fo:region-after, fo:region-start, fo:region-end, fo:block-container, fo:external-graphic, fo:instream-foreign-object, fo:inline-container, and fo:table-cell.

Property dominant-baseline applies to: fo:character, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, and fo:basic-link.

Property elevation applies to: fo:title, fo:block, fo:bidirectional-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property empty-cells applies to: fo:table-cell.

Property end-indent applies to: fo:simple-page-master, fo:region-body, fo:block, fo:block-container, fo:table-and-caption, fo:table, fo:list-block, and fo:list-item.

Property ends-row applies to: fo:table-cell.

Property extent applies to: fo:region-before, fo:region-after, fo:region-start, and fo:region-end.

Property external-destination applies to: fo:basic-link, and fo:bookmark.

Property float applies to: fo:float.

Property flow-map-name applies to: fo:flow-map.

Property flow-map-reference applies to: fo:page-sequence.

Property flow-name applies to: fo:flow, and fo:static-content.

Property flow-name-reference applies to: fo:flow-name-specifier.

Property font-family applies to: fo:title, fo:block, fo:bidirectional-override, fo:character, fo:initial-property-set, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, and fo:scaling-value-citation.

Property font-selection-strategy applies to: fo:title, fo:block, fo:bidirectional-override, fo:character, fo:initial-property-set, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, and fo:scaling-value-citation.

Property font-size applies to: fo:title, fo:block, fo:bidirectional-override, fo:character, fo:initial-property-set, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, and fo:scaling-value-citation.

Property font-size-adjust applies to: fo:title, fo:block, fo:bidirectional-override, fo:character, fo:initial-property-set, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, and fo:scaling-value-citation.

Property `font-stretch` applies to: `fo:title`, `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:inline`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `font-style` applies to: `fo:title`, `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:inline`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `font-variant` applies to: `fo:title`, `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:inline`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `font-weight` applies to: `fo:title`, `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:inline`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `force-page-count` applies to: `fo:page-sequence`.

Property `format` applies to: `fo:page-sequence`, and `fo:scaling-value-citation`.

Property `glyph-orientation-horizontal` applies to: `fo:character`.

Property `glyph-orientation-vertical` applies to: `fo:character`.

Property `grouping-separator` applies to: `fo:page-sequence`, and `fo:scaling-value-citation`.

Property `grouping-size` applies to: `fo:page-sequence`, and `fo:scaling-value-citation`.

Property `height` applies to: `fo:block-container`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:table`, `fo:table-caption`, `fo:table-row`, and `fo:table-cell`.

Property `hyphenate` applies to: `fo:block`, and `fo:character`.

Property `hyphenation-character` applies to: `fo:block`, and `fo:character`.

Property `hyphenation-keep` applies to: `fo:block`.

Property `hyphenation-ladder-count` applies to: `fo:block`.

Property `hyphenation-push-character-count` applies to: `fo:block`, and `fo:character`.

Property `hyphenation-remain-character-count` applies to: `fo:block`, and `fo:character`.

Property `id` applies to: `fo:root`, `fo:page-sequence`, `fo:page-sequence-wrapper`, `fo:flow`, `fo:static-content`, `fo:block`, `fo:block-container`, `fo:bidi-override`, `fo:character`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, `fo:list-item-body`, `fo:list-item-label`, `fo:basic-link`, `fo:multi-switch`, `fo:multi-case`, `fo:multi-toggle`, `fo:multi-property-set`, `fo:index-range-begin`, `fo:float`, `fo:footnote`, `fo:footnote-body`, and `fo:wrapper`.

Property `index-class` applies to: `fo:root`, `fo:page-sequence`, `fo:page-sequence-wrapper`, `fo:flow`, `fo:static-content`, `fo:block`, `fo:block-container`, `fo:bidi-override`, `fo:character`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, `fo:list-item-body`, `fo:list-item-label`, `fo:basic-link`, `fo:multi-switch`, `fo:multi-case`, `fo:multi-toggle`, `fo:multi-property-set`, `fo:index-range-begin`, `fo:float`, `fo:footnote`, `fo:footnote-body`, and `fo:wrapper`.

Property `index-key` applies to: `fo:root`, `fo:page-sequence`, `fo:page-sequence-wrapper`, `fo:flow`, `fo:static-content`, `fo:block`, `fo:block-container`, `fo:bidi-override`, `fo:character`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, `fo:list-item-body`, `fo:list-item-label`, `fo:basic-link`, `fo:multi-switch`, `fo:multi-case`, `fo:multi-toggle`, `fo:multi-property-set`, `fo:index-range-begin`, `fo:float`, `fo:footnote`, `fo:footnote-body`, and `fo:wrapper`.

Property `indicate-destination` applies to: `fo:basic-link`.

Property `initial-page-number` applies to: `fo:page-sequence`.

Property `inline-progression-dimension` applies to: `fo:block-container`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:table`, `fo:table-caption`, and `fo:table-cell`.

Property `internal-destination` applies to: `fo:basic-link`, and `fo:bookmark`.

Property `intrinsic-scale-value` applies to: `fo:scaling-value-citation`.

Property `intrusion-displace` applies to: `fo:block`, `fo:block-container`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:list-block`, and `fo:list-item`.

Property `keep-together` applies to: `fo:block`, `fo:block-container`, `fo:inline`, `fo:inline-container`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-row`, `fo:list-block`, `fo:list-item`, `fo:list-item-body`, `fo:list-item-label`, and `fo:basic-link`.

Property `keep-with-next` applies to: `fo:block`, `fo:block-container`, `fo:character`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-row`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `keep-with-previous` applies to: `fo:block`, `fo:block-container`, `fo:character`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-row`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `language` applies to: `fo:block`, and `fo:character`.

Property `last-line-end-indent` applies to: `fo:block`.

Property `leader-alignment` applies to: `fo:leader`.

Property `leader-length` applies to: `fo:leader`.

Property `leader-pattern` applies to: `fo:leader`.

Property `leader-pattern-width` applies to: `fo:leader`.

Property `left` applies to: `fo:block-container`.

Property `left` applies to: `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `letter-spacing` applies to: `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.



Property letter-value applies to: fo:page-sequence, and fo:scaling-value-citation.

Property linefeed-treatment applies to: fo:block.

Property line-height applies to: fo:title, fo:block, fo:bidirectional-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, and fo:basic-link.

Property line-height-shift-adjustment applies to: fo:block.

Property line-stacking-strategy applies to: fo:block.

Property margin-bottom applies to: fo:simple-page-master, fo:region-body, fo:block, fo:block-container, fo:table-and-caption, fo:table, fo:list-block, and fo:list-item.

Property margin-bottom applies to: fo:title, fo:character, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, and fo:basic-link.

Property margin-left applies to: fo:simple-page-master, fo:region-body, fo:block, fo:block-container, fo:table-and-caption, fo:table, fo:list-block, and fo:list-item.

Property margin-left applies to: fo:title, fo:character, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, and fo:basic-link.

Property margin-right applies to: fo:simple-page-master, fo:region-body, fo:block, fo:block-container, fo:table-and-caption, fo:table, fo:list-block, and fo:list-item.

Property margin-right applies to: fo:title, fo:character, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, and fo:basic-link.

Property margin-top applies to: fo:simple-page-master, fo:region-body, fo:block, fo:block-container, fo:table-and-caption, fo:table, fo:list-block, and fo:list-item.

Property margin-top applies to: fo:title, fo:character, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, and fo:basic-link.

Property marker-class-name applies to: fo:marker.

Property master-name applies to: fo:page-sequence-master, and fo:simple-page-master.

Property master-reference applies to: fo:page-sequence, fo:single-page-master-reference, fo:repeatable-page-master-reference, and fo:conditional-page-master-reference.

Property maximum-repeats applies to: fo:repeatable-page-master-reference, and fo:repeatable-page-master-alternatives.

Property media-usage applies to: fo:root.

Property merge-pages-across-index-key-references applies to: fo:index-page-citation-list.

Property merge-ranges-across-index-key-references applies to: fo:index-page-citation-list.

Property merge-sequential-page-numbers applies to: fo:index-page-citation-list.

Property number-columns-repeated applies to: fo:table-column.

Property number-columns-spanned applies to: fo:table-column, and fo:table-cell.

Property `number-rows-spanned` applies to: `fo:table-cell`.

Property `odd-or-even` applies to: `fo:conditional-page-master-reference`.

Property `orphans` applies to: `fo:block`.

Property `overflow` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:block-container`, `fo:external-graphic`, `fo:instream-foreign-object`, and `fo:inline-container`.

Property `padding-after` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `padding-before` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `padding-bottom` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `padding-end` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `padding-left` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `padding-right` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `padding-start` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `padding-top` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:title`, `fo:block`, `fo:block-container`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-`

number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-cell, fo:list-block, fo:list-item, and fo:basic-link.

Property page-citation-strategy applies to: fo:page-number-citation-last.

Property page-height applies to: fo:simple-page-master.

Property page-number-treatment applies to: fo:index-key-reference.

Property page-position applies to: fo:conditional-page-master-reference.

Property page-width applies to: fo:simple-page-master.

Property pause-after applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property pause-before applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property pitch applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property pitch-range applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property play-during applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property precedence applies to: fo:region-before, and fo:region-after.

Property provisional-distance-between-starts applies to: fo:list-block.

Property provisional-label-separation applies to: fo:list-block.

Property reference-orientation applies to: fo:page-sequence, fo:simple-page-master, fo:region-body, fo:region-before, fo:region-after, fo:region-start, fo:region-end, fo:block-container, and fo:inline-container.

Property ref-id applies to: fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, and fo:index-range-end.

Property ref-index-key applies to: fo:index-key-reference.

Property `region-name` applies to: `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, and `fo:region-end`.

Property `region-name-reference` applies to: `fo:region-name-specifier`.

Property `relative-align` applies to: `fo:table-cell`, and `fo:list-item`.

Property `relative-position` applies to: `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `rendering-intent` applies to: `fo:color-profile`.

Property `retrieve-boundary` applies to: `fo:retrieve-marker`.

Property `retrieve-boundary-within-table` applies to: `fo:retrieve-table-marker`.

Property `retrieve-class-name` applies to: `fo:retrieve-marker`, and `fo:retrieve-table-marker`.

Property `retrieve-position` applies to: `fo:retrieve-marker`.

Property `retrieve-position-within-table` applies to: `fo:retrieve-table-marker`.

Property `richness` applies to: `fo:title`, `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, `fo:basic-link`, `fo:change-bar-begin`, and `fo:change-bar-end`.

Property `right` applies to: `fo:block-container`.

Property `right` applies to: `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `role` applies to: `fo:root`, `fo:title`, `fo:block`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, `fo:list-item-body`, `fo:list-item-label`, `fo:basic-link`, `fo:multi-switch`, `fo:multi-case`, `fo:multi-toggle`, `fo:multi-properties`, `fo:bookmark`, `fo:bookmark-title`, `fo:footnote`, `fo:footnote-body`, `fo:change-bar-begin`, and `fo:change-bar-end`.

Property `rule-style` applies to: `fo:leader`.

Property `rule-thickness` applies to: `fo:leader`.

Property `scale-option` applies to: `fo:scaling-value-citation`.

Property `scaling` applies to: `fo:external-graphic`, and `fo:instream-foreign-object`.

Property `scaling-method` applies to: `fo:external-graphic`, and `fo:instream-foreign-object`.

Property `score-spaces` applies to: `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `script` applies to: `fo:block`, and `fo:character`.

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Property show-destination applies to: fo:basic-link.

Property source-document applies to: fo:root, fo:title, fo:block, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:list-item-body, fo:list-item-label, fo:basic-link, fo:multi-switch, fo:multi-case, fo:multi-toggle, fo:multi-properties, fo:bookmark, fo:bookmark-title, fo:footnote, fo:footnote-body, fo:change-bar-begin, and fo:change-bar-end.

Property space-after applies to: fo:simple-page-master, fo:region-body, fo:block, fo:block-container, fo:table-and-caption, fo:table, fo:list-block, and fo:list-item.

Property space-before applies to: fo:simple-page-master, fo:region-body, fo:block, fo:block-container, fo:table-and-caption, fo:table, fo:list-block, and fo:list-item.

Property space-end applies to: fo:title, fo:character, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, and fo:basic-link.

Property space-start applies to: fo:title, fo:character, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:inline-container, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, and fo:basic-link.

Property span applies to: fo:block, and fo:block-container.

Property speak applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property speak-header applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property speak-numeral applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property speak-punctuation applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property speech-rate applies to: fo:title, fo:block, fo:bidi-override, fo:character, fo:initial-property-set, fo:external-graphic, fo:instream-foreign-object, fo:inline, fo:leader, fo:page-number, fo:page-number-citation, fo:page-number-citation-last, fo:scaling-value-citation, fo:table-and-caption, fo:table, fo:table-caption, fo:table-header, fo:table-footer, fo:table-body, fo:table-row, fo:table-cell, fo:list-block, fo:list-item, fo:basic-link, fo:change-bar-begin, and fo:change-bar-end.

Property `src` applies to: `fo:color-profile`, and `fo:external-graphic`.

Property `start-indent` applies to: `fo:simple-page-master`, `fo:region-body`, `fo:block`, `fo:block-container`, `fo:table-and-caption`, `fo:table`, `fo:list-block`, and `fo:list-item`.

Property `starting-state` applies to: `fo:multi-case`, and `fo:bookmark`.

Property `starts-row` applies to: `fo:table-cell`.

Property `stress` applies to: `fo:title`, `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, `fo:basic-link`, `fo:change-bar-begin`, and `fo:change-bar-end`.

Property `suppress-at-line-break` applies to: `fo:character`.

Property `switch-to` applies to: `fo:multi-toggle`.

Property `table-layout` applies to: `fo:table`.

Property `table-omit-footer-at-break` applies to: `fo:table`.

Property `table-omit-header-at-break` applies to: `fo:table`.

Property `target-presentation-context` applies to: `fo:basic-link`.

Property `target-processing-context` applies to: `fo:basic-link`.

Property `target-stylesheet` applies to: `fo:basic-link`.

Property `text-align` applies to: `fo:block`, `fo:external-graphic`, `fo:instream-foreign-object`, and `fo:table-and-caption`.

Property `text-align-last` applies to: `fo:block`.

Property `text-altitude` applies to: `fo:block`, `fo:character`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `text-decoration` applies to: `fo:character`, `fo:initial-property-set`, `fo:inline`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `text-depth` applies to: `fo:block`, `fo:character`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `text-indent` applies to: `fo:block`.

Property `text-shadow` applies to: `fo:character`, `fo:initial-property-set`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `text-transform` applies to: `fo:character`, `fo:initial-property-set`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `top` applies to: `fo:block-container`.

Property `top` applies to: `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, and `fo:basic-link`.

Property `treat-as-word-space` applies to: `fo:character`.

Property `unicode-bidi` applies to: `fo:bidi-override`.

Property `visibility` applies to: `fo:title`, `fo:block`, `fo:character`, `fo:inline`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-column`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, and `fo:table-row`.

Property `voice-family` applies to: `fo:title`, `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, `fo:basic-link`, `fo:change-bar-begin`, and `fo:change-bar-end`.

Property `volume` applies to: `fo:title`, `fo:block`, `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, `fo:scaling-value-citation`, `fo:table-and-caption`, `fo:table`, `fo:table-caption`, `fo:table-header`, `fo:table-footer`, `fo:table-body`, `fo:table-row`, `fo:table-cell`, `fo:list-block`, `fo:list-item`, `fo:basic-link`, `fo:change-bar-begin`, and `fo:change-bar-end`.

Property `white-space-collapse` applies to: `fo:block`.

Property `white-space-treatment` applies to: `fo:block`.

Property `widows` applies to: `fo:block`.

Property `width` applies to: `fo:block-container`, `fo:external-graphic`, `fo:instream-foreign-object`, `fo:inline`, `fo:inline-container`, `fo:table`, `fo:table-caption`, and `fo:table-cell`.

Property `word-spacing` applies to: `fo:bidi-override`, `fo:character`, `fo:initial-property-set`, `fo:leader`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `wrap-option` applies to: `fo:block`, `fo:inline`, `fo:page-number`, `fo:page-number-citation`, `fo:page-number-citation-last`, and `fo:scaling-value-citation`.

Property `writing-mode` applies to: `fo:page-sequence`, `fo:simple-page-master`, `fo:region-body`, `fo:region-before`, `fo:region-after`, `fo:region-start`, `fo:region-end`, `fo:block-container`, `fo:inline-container`, and `fo:table`.

Property `z-index` applies to: `fo:block-container`, and `fo:change-bar-begin`.

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## Appendix D. Property Index

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## Appendix E. Changes from XSL 1.0 (Non-Normative)

This section lists all non-editorial changes that have been made:

- The published errata, 2003-11-17, have been incorporated in the text.
- New functionality has been added to support:
  - Change marks.
  - "Back of the book" index.
  - Bookmarks.
  - "Markers" in tables to support e.g. partial sums.
  - A new fo:page-number-citation-last.
  - Multiple flows.
  - A new fo:page-sequence-wrapper.
- Existing functionality has been extended for:
  - Conditional graphic scaling.
  - A value of "only" has been added to the page-position property.
  - Values "inside" and "outside" have been added to the clear and float properties.



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- A prefix and suffix may be specified for page numbers. A page number consists of an optional folio-prefix, a folio-number, and an optional folio-suffix. The *page-number* has been renamed *folio-number*.
  - The definition of `xml:lang` has been updated to also refer to "or its successor" of RFC3066 to match the definition in the XML recommendation.
  - The support for XML/XML Names 1.0 and 1.1 has been made consistent with the text in XSLT 1.0 errata.
  - `<uri-specification>` has been modified to support IRIs.
  - Miscellaneous changes:
    - In the content of `fo:declarations` the `fo:color-profile` may occur 0 or more times.
    - It has been clarified that `absolute-position="absolute"` is with respect to the nearest ancestor reference area.
    - Changes have been made to the "id" handling. "id" also applies to `fo:root`, `fo:static-content`, `fo:flow`, `fo:footnote-body`, `fo:footnote`, `fo:float`. "id" has been removed from `fo:initial-property-set` and `fo:multi-properties`.
    - "reference-orientation" is no longer an inherited property.
    - It has been clarified that the value of the "reference-orientation" and "writing-mode" are determined by the formatting object that generates the area. A new property value function "from-page-master-region" has been added to permit obtaining the value specified in the page master.
    - The description of `<country>` in § 7.10.1 – “country” on page 280 has been made consistent with its definition in § 5.11 – [Property Datatypes](#) on page 69.
    - Inconsistencies between property value definitions and explanatory text for white space handling has been resolved.
    - An error in the positioning of nested inline areas involving baseline scaling has been corrected.
    - `xml:lang`, the value has been changed from `<country-language>` to `<language-country>` and the implied optionality of the language component removed to correspond with the definition in XML.
    - The value "transparent" has been added to the individual border-"x"-color properties to be consistent with the border-color shorthand.
    - Restrictions, preventing "circularity", on the descendants of `fo:marker` have been added.
    - A contradiction in the description of `fo:initial-property-set` between the "Areas" and "Trait Derivation" has been corrected by replacing "fo:wrapper" with "fo:inline" in the "Trait Derivation".
    - An optional recovery action for some errors in tables has been specified.

## Appendix F. Acknowledgements (Non-Normative)

This specification was developed and approved for publication by the W3C XSL Working Group (WG). WG approval of this specification does not necessarily imply that all WG members voted for its approval.

During the development of XSL 1.1 the members of the XSL FO Subgroup were:

Sharon Adler, IBM; Klaas Bals, Inventive Designers; Anders Berglund, IBM; Jeff Caruso, Pageflex; Stephen Deach, Adobe; Fabio Giannetti, HP; Paul Grosso, PTC-Arbortext; Eliot Kimber, Isogen; Michael Sulyaev, RenderX; Norman Walsh, Sun Microsystems; Liam Quin, W3C; Steve Zilles, Adobe

The XSL Working Group wishes to thank RenderX, Inc. for producing the PDF version of this specification.

The PDF version has been produced from the XML source through an intermediate XSL Formatting Object representation, converted to PDF using XEP - an XSL FO rendering engine by RenderX, Inc. (<http://www.renderX.com>).