



IEC/TC OR SC: <b>TC15</b>	SECRETARIAT: <b>US</b>	DATE: <b>2018-01-27</b>
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Please ensure this form is annexed to the Report to the Standardization Management Board if it has been prepared during a meeting, or sent to the Central Office promptly after its contents have been agreed by the committee.

**A. STATE TITLE AND SCOPE OF TC**

**Solid Electrical Insulating Material**

Are there any new or emerging trends in technology that will impact the scope and work activities of the TC?

No..

Do you need to update your scope to reflect new and emerging technologies? No.

The scope remains:

To prepare international standards including specifications for solid electrical insulating materials alone and in simple combinations. This includes coatings which are applied in the liquid state but cure to solids, such as varnishes and coatings.'

Note: TC15 strictly understands "simple combination" as insulation materials (e.g. combined flexible materials according to IEC 60626) and not as combinations of insulation materials due to the manufacturing process of electrical devices. This does not exclude that during testing it might be necessary to include electrodes on specimens of material.

**B. MANAGEMENT STRUCTURE OF THE TC**

**Working Groups**

- WG 5 Flexible insulating sleeving and moulded shapes for electrical purposes
- WG 6 Rigid fibrous reinforced laminates for electrical purposes
- WG 7 Resins and varnishes

**Maintenance Teams**

- MT 1 Inorganic (ceramic and glass) insulating materials
- MT 3 Plastic films
- MT 10 Combined flexible materials
- MT 11 Mica products

- MT14 Non-cellulosic and laminated pressboard
- MT15 Cellulosic paper and pressboard
- MT16 Pressure sensitive tape, ceramic and glass, vulcanized fabric

When was the last time the TC reviewed its management structure? 2017 In approving the disbandment of WG9 and the realignment of its responsibilities into three (3) maintenance teams

#### C. BUSINESS ENVIRONMENT

Solid electrical insulating materials cover the whole range of materials starting from glass and ceramic, sleeveings, paper, and press boards, films and laminates, mica products, tapes, moulded shapes and varnishes and resins. Insulating materials are used in the field of electrical power generation and distribution, in electrical motors and transformers, in all kinds of electrical and electronic appliances and equipment. The appropriate selection and use of insulating materials enhances the reliability and safety of electrical equipment. With the materials and user technologies well-established and globally similar, a relatively small number of manufacturers, the most important of which are multinational companies, produce basic materials which are sold through local and regional distributors and fabricators. The market for these insulating materials exceeds 1000 Million US\$ per year. Innovation is driven by manufacturers' efforts to better serve specific market segments. [European legislation, especially REACH and SVHC material, is forcing the manufacturers to substitute many raw materials.](#)

The resulting "new" products are not always comparable with the "old" ones.

#### D. MARKET DEMAND

The standards of TC15 are widely used in the IEC. The specifications are the basis for commercial definitions in trade. Customers of TC15 reside in all parts of the supply chain, but are primarily insulating materials manufacturers, equipment manufacturers and certain materials specifiers. Since the standards in the range of TC15 are widely used, regular maintenance is necessary. The successive development of new materials or improved properties of materials requires additionally a continuous monitoring of the market in order to offer the appropriate standards.

[Car manufacturers are "inventing" the electric motor again. The trends are: smaller engines resulting in higher operating temperatures leading to reduced life time \(<5000 h\), additional mechanical stress and permanent changing operation conditions](#)

For the car manufacturers, they are looking at higher temperatures and additional mechanical stresses. Their life requirements are not necessarily shorter due to the expectation of shorter life from higher temperatures (as this can be designed by selecting higher performance materials), but rather due to the life requirement of the electric vehicle. I typically hear of 10,000 hours as an upper requirement (with 50 miles/hour average operation this works out to 500,000 miles) which seems a safe upper limit.

They also, however are looking at higher voltage designs (up to 1000 Volts), which will lead to a dilemma when it comes to insulation materials and systems. Do we use a high voltage system (typically mica based from MT11 and filled impregnating resins from WG7) or do we use a beefed up low voltage insulation system using combinations of materials

We need to work on improved/modified test methods to cover these new applications and to try to better understand the applications. High voltage insulation systems are typically manually produced and low voltage can use automated methods. These new higher voltage automotive motors will be built in high volumes (so need automation), but need this slightly higher voltage.

Our standards will need to adapt as engineers (both suppliers and OEMs) develop new ways of solving this issue. Our test method documents need to provide as much of the new test methods as possible so engineers look to our document for guidance.

#### **E. TRENDS IN TECHNOLOGY AND IN THE MARKET**

The steadily increasing demand for electrical products throughout the world is matched by the increasing consolidation and mergers within industry. And with trade becoming more global, TC15 faces an increasing demand for the international standardisations within its scope of products.

Most important insulation uses are relatively similar throughout the world, with frequent development of specialized variants of existing insulation materials and components. While Markets are stable, technology is changing because of the need to meet climate change and facilitate recycling.

Because engineering knowledge is widely communicated, international trade in equipment using electrical insulation products covered by TC15 standards is widespread and will likely continue. However, many important materials are proprietary to one or a few large multinational manufacturers and are made predominantly in a few countries and shipped throughout the world. This factor underscores the users' desire that the product meet widely-accepted standards with minimum testing and qualification costs

As TC15 looks to "globalize" its reach, a document is needed to add clarity into all of Part 3 documents as to what "specification values" mean. There are some global standards where these values are meant to be a 100% guaranteed value (100% of product must meet this limit). This appears to be the case for TC15 documents. There are standards where the values are used as a one-time test limit, which means that one must only provide a single sample meeting the requirement and then they are certified to be in compliance. These approaches are quite different and the numbers which would be assigned as limits would be different. TC15 is considering the second approach for some of our "new tests" which are being developed for EV motors, etc., so that one only does a single test (for say thermal conductivity or some number like that), for parameters which are not expected to change much from lot to lot, but would be very expensive to test with every production lot..

#### **F. SYSTEMS APPROACH ASPECTS (REFERENCE - AC/33/2013)**

TC15 publishes specifications for widely used electrical equipment. All electrical systems require insulation and most use some materials covered in the TC15 compendium. The System approach relevance of TC15 is as follows:

Systems Committees

*TC2 Rotating Machinery*

*TC14 Power transformers*

*TC23 Electrical accessories*

*TC96 Small power transformers*

*TC112 Evaluation and qualification of electrical insulating materials and systems*

Other Committees:

*TC33 Power capacitors*

*TC40 Capacitors*

*TC61 Household appliances*

**G. CONFORMITY ASSESSMENT**

With reference to clause 6.7 of Part 2 of the ISO/IEC directives, are all your publications in line with the requirements related to conformity assessment aspects?

Where and when appropriate.

Will the TC/SC publications be used for IEC Conformity Assessment Systems (IECEE, IECEx, IECQ, IECRE)?

No.

Will any of your standards include test specifications, reproducible test requirements, and test methods?

Yes.

Are there likely to be special conformity assessment requirements generated by any standards projects?

No..

**H. 3-5 YEAR PROJECTED STRATEGIC OBJECTIVES, ACTIONS, TARGET DATES**

STRATEGIC OBJECTIVES 3-5 YEARS	ACTIONS TO SUPPORT THE STRATEGIC OBJECTIVES	TARGET DATE(S) TO COMPLETE THE ACTIONS
Objective 1: Engage in on-going monitoring and review of developing industrial technologies and revise TC15 standards accordingly or introduce new standards.	Annual review of committee publications that will reach stability in three years, assess viability and technology changes and initiate action for revision.,	Circulate CD/CDV as appropriate in 2018, 2019 and 2020 .
Objective 2: Execute TC15 maintenance program targetted annually for 2018, 2019 and 2020	Identify publications whose technology continues to be valid and applicable in the market but for which technology changes are unlikely.	Circulate documents for member review and guidance in 2018, 2019 and 2020.

Note: The progress on the actions should be reported in the RSMB.