

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Resin based reactive compounds used for electrical insulation –  
Part 3-8: Specifications for individual materials – Resins for cable accessories**

**Composés réactifs à base de résines utilisés comme isolants électriques –  
Partie 3-8: Spécifications pour matériaux particuliers – Résines pour  
accessoires de câble**



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COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RESIN BASED REACTIVE COMPOUNDS USED  
FOR ELECTRICAL INSULATION –****Part 3-8: Specifications for individual materials –  
Resins for cable accessories**

## FOREWORD

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International Standard IEC 60455-3-8 has been prepared by IEC technical committee 15: Solid electrical insulating materials.

This second edition cancels and replaces the first edition published in 2013. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Clause 1: a link to assemblies according to IEC 60502-4 and EN 50393 was introduced;
- b) designation: the categories, especially the mechanical ones, were redefined;
- c) type tests: the testing was updated based on the chemical basis of the material;
- d) type tests: additional materials were introduced;
- e) Annex A: an examination grid was established.

The text of this International Standard is based on the following documents:

| FDIS        | Report on voting |
|-------------|------------------|
| 15/937/FDIS | 15/941/RVD       |

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

A list of all parts in the IEC 60455 series, published under the general title *Resin based reactive compounds used for electrical insulation*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## INTRODUCTION

This part of IEC 60455 is one of a series which deals with specifications for reactive compounds and their components for electrical insulation. This series consists of three parts:

Part 1: Definitions and general requirements (IEC 60455-1);

Part 2: Methods of test (IEC 60455-2);

Part 3: Specifications for individual materials (IEC 60455-3)

IEC 60455-3-8 is one of the specification sheets comprising Part 3 as follows:

Sheet 8: Resins for cable accessories

## RESIN BASED REACTIVE COMPOUNDS USED FOR ELECTRICAL INSULATION –

### Part 3-8: Specifications for individual materials – Resins for cable accessories

#### 1 Scope

This part of IEC 60455 gives the requirements for resins for power cable accessories that conform to this specification and meet established levels of performance. However, the selection of a material by a user for a specific application will be based on the actual requirements necessary for adequate performance in that application and not on this specification alone.

These materials are designed to be used in low and medium voltage cable accessories and as such, electrical performance is proven as part of the assembly. Examples of this are described in EN 50393 and IEC 60502-4.

#### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60212, *Standard conditions for use prior to and during the testing of solid electrical insulating materials*

IEC 60243-1, *Electric strength of insulating materials – Test methods – Part 1: Tests at power frequencies*

IEC 60455-2:2015, *Resin based reactive compounds used for electrical insulation – Part 2: Methods of test*

IEC 62631-2-1, *Dielectric and resistive properties of solid insulating materials – Part 2-1: Relative permittivity and dissipation factor – Technical Frequencies (0,1 Hz – 10 MHz) – AC Methods*

IEC 62631-3-1, *Dielectric and resistive properties of solid insulating materials – Part 3-1: Determination of resistive properties (DC methods) – Volume resistance and volume resistivity – General method*

IEC 62631-3-2, *Dielectric and resistive properties of solid insulating materials – Part 3-2: Determination of resistive properties (DC methods) – Surface resistance and surface resistivity*

ISO 179 (all parts), *Plastics – Determination of Charpy impact properties*

ISO 527 (all parts), *Plastics – Determination of tensile properties*

ISO 868, *Plastics and ebonite – Determination of indentation hardness by means of a durometer (Shore hardness)*



ISO 1183-1, *Plastics – Methods for determining the density of non-cellular plastics – Part 1: Immersion method, liquid pycnometer method and titration method*

ISO 2137, *Petroleum products and lubricants – Determination of cone penetration of lubricating greases and petrolatum*

ISO 2555, *Plastics — Resins in the liquid state or as emulsions or dispersions — Determination of apparent viscosity using a single cylinder type rotational viscometer method*

ISO 4895, *Plastics – Liquid epoxy resins – Determination of tendency to crystallize*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

#### 3.1

##### tendency to crystallization

measurement of the ability of epoxy based resin not to change from a liquid to a solid state at a certain temperature close to water freezing point for a fixed time

#### 3.2

##### type test

test made on materials or components of a cable accessory in order to demonstrate satisfactory performance characteristics to meet the intended application

### 4 Designation

Resins for cable accessories are classified in categories according to their application as follows (see Table 1):

**Table 1 – Categories of resins**

| Voltage class                                                                                             | Mechanical classification | Characteristic                                                  |
|-----------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------|
| Low voltage (L)                                                                                           | Rigid (R)                 | Suitable for applications in presence of water <sup>a</sup> (W) |
| Medium voltage (M)                                                                                        | Soft (S)                  |                                                                 |
|                                                                                                           | Gel-like ( <b>G</b> )     |                                                                 |
| <sup>a</sup> Low foaming during curing when in contact with water as described in IEC 60455-2:2015, 5.26. |                           |                                                                 |

For the purposes of this document:

- rigid is defined as Shore D > 30, the material has self-supporting properties,
- soft is defined as Shore D ≤ 30 and Shore A ≥ 10,
- gel-like is defined as Shore A < 10.