

SLOVENSKI STANDARD

SIST HD 307.3.1 S1:1998

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oktober 1998

Specification for solventless polymerisable resinous compounds used for electrical insulation - Part 3: Specifications for individual materials - Sheet 1: Unfilled epoxy resinous compounds (IEC 60455-3-1:1981)

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KEY WORDS: Unfilled epoxy resinous compound; solventless polymerisable resinous compound; specification; electrical insulation

SPECIFICATION FOR SOLVENTLESS POLYMERISABLE
RESINOUS COMPOUNDS USED FOR ELECTRICAL INSULATION
PART 3: SPECIFICATIONS FOR INDIVIDUAL MATERIALS
SHEET 1: UNFILLED EPOXY RESINOUS COMPOUNDS

Spécification relative aux
composés résineux polymérisables
sans solvant utilisés comme
isolants électriques
Troisième partie: Spécifications
pour les matériaux particuliers
Feuille 1: Composés résineux
époxydes sans charge

Bestimmung für
lösemittelfreie härtbare
Reaktionsharzmassen für die
Elektroisolierung
Teil 3: Anforderungen an
einzelne Werkstoffe
Blatt 1: Ungefüllte
Epoxidharzwerkstoffe

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BODY OF THE HD

The Harmonization Document consists of:

- IEC 455-3-1 (1981) ed 1, IEC/SC 15C, not appended

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This Harmonization Document was approved by CENELEC on 26 June 1986.

The English and French versions of this Harmonization Document are provided by the text of the IEC publication and the German version is the official translation of the IEC text.

According to the CENELEC Internal Regulations the CENELEC member National Committees are bound:

to announce the existence of this Harmonization Document at national level by or before 1987-01-01

to publish their new harmonized national standard by or before 1987-07-01

to withdraw all conflicting national standards by or before 1987-07-01.

Harmonized national standards are listed on the HD information sheet, which is available from the CENELEC National Committees or from the CENELEC Central Secretariat.

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE
NORME DE LA CEI

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC STANDARD

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Spécification relative aux composés résineux polymérisables sans solvant
utilisés comme isolants électriques

Troisième partie: Spécifications pour les matériaux particuliers

Feuille 1: Composés résineux époxydes sans charge

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Specification for solventless polymerisable resinous compounds
used for electrical insulation

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Part 3: Specifications for individual materials

Sheet 1: Unfilled epoxy resinous compounds

Mots clés: isolants; résines synthétiques
et composants d'enrobage;
matières macromoléculaires;
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Key words: insulants; synthetic resins
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macromolecular materials;
requirements; properties.



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SPECIFICATION FOR
SOLVENTLESS POLYMERISABLE RESINOUS COMPOUNDS
USED FOR ELECTRICAL INSULATION**

**Part 3: Specifications for individual materials
Sheet 1: Unfilled epoxy resinous compounds**

FOREWORD

- 1) The formal decisions or agreements of the I E C on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the I E C expresses the wish that all National Committees should adopt the text of the I E C recommendation for their national rules in so far as national conditions will permit. Any divergence between the I E C recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

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PREFACE

This standard has been prepared by Sub-Committee 15C, Specifications, of I E C Technical Committee No. 15: Insulating Materials.

A first draft was discussed at the meeting held in Zurich in 1979. As a result of this meeting, a draft, Document 15C(Central Office)107, was submitted to the National Committees for approval under the Six Months' Rule in October 1979.

The National Committees of the following countries voted explicitly in favour of publication:

Austria	Italy
Belgium	Japan
Brazil	New Zealand
Bulgaria	Norway
Canada	Poland
China	Sweden
Czechoslovakia	Switzerland
Denmark	Turkey
Firiländ	Union of Soviet
France	Socialist Republics
Germany	Yugoslavia
Ireland	

**SPECIFICATION FOR
SOLVENTLESS POLYMERISABLE RESINOUS COMPOUNDS
USED IN ELECTRICAL INSULATION**

**Part 3: Specifications for individual materials
Sheet 1: Unfilled epoxy resinous compounds**

INTRODUCTION

This standard is one of the series which deals with solventless polymerisable resinous compounds used for electrical insulation. The series will have the following three parts:

Part 1: Definitions and general requirements (I E C Publication 455-1).

Part 2: Methods of test (I E C Publication 455-2).

Part 3: Specifications for individual materials.

1. Scope

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This sheet 1 of Part 3 of the standard contains the requirements for unfilled epoxy resinous compounds in the cured form for classes EP-U-1 to EP-U-6.

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2. Requirements

The requirements for unfilled epoxy resinous compounds in the cured form are given in Table I.

Note. — Materials for use in low temperature conditions may require additional tests to establish their suitability.

TABLE I
Requirements for unfilled epoxy compounds in the cured form

Properties	Methods of test according to Part 2 (Clause)	Units	Range	Requirements for compounds types					
				EP-U-1	EP-U-2	EP-U-3	EP-U-4	EP-U-5	EP-U-6
Density	23	g/cm ³	Range	1.1-1.3	1.15-1.25	1.15-1.25	1.15-1.25	1.15-1.25	1.15-1.25
Flexural strength	24	MPa	min.	50	80	100	115	90	80
Tensile strength	25	MPa	min.	50	50	50	50	50	30
Impact strength	26	kJ/m ²	min.	7	8	12	15	12	10
Coefficient of linear thermal expansion for temperature range	29	K	Range °C max.	23-100 80 × 10 ⁻⁶	23-100 80 × 10 ⁻⁶	23-100 100 × 10 ⁻⁶	23-80 100 × 10 ⁻⁶	23-50 100 × 10 ⁻⁶	23-50 125 × 10 ⁻⁶
Temperature of deflection under load	32	°C	min.	160	135	125	100	75	45
Flammability	33			No restriction of destroyed length					
Water absorption	34	mg	max.	20	20	25	20	35	80
Volume resistivity	36	Ω cm	min.	10 ¹⁴	10 ¹⁴	10 ¹⁴	10 ¹⁴	10 ¹⁴	10 ¹⁴
Dissipation factor At 23 °C	37		max.	0.01	0.01	0.01	0.01	0.01	0.01
At elevated temp *									
Permittivity At 23 °C	37		min.	5	5	5	5	5	5
At elevated temp **									
Electric strength **	38	kV/mm	min.	15	15	15	15	15	15
Tracking resistance	40	CTI	min.	300	300	300	300	300	300
Thermal endurance by flexural strength to 50% of initial value ***	42	TI	min.	140	130	120	100	90	Under consideration

* The temperatures for determining dissipation factor at elevated temperature are as follows:

EP-U-1	160 °C
EP-U-2	135 °C
EP-U-3	125 °C
EP-U-4	100 °C
EP-U-5	75 °C
EP-U-6	45 °C

** The specimen shall be 3 mm thick and of sufficient area to prevent flashover.

*** The value indicated for the temperature indices are minimum values which can therefore be considerably exceeded and should not be considered as characterizing the category or as being related to the deflection temperature.