# SLOVENSKI STANDARD
# SIST EN 50655-1:2018

**01-januar-2018**

**Nadomešča:**
**SIST HD 631.1 S2:2008**

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**Električni kabli - Pribor - Značilnosti materialov - 1. del: Identifikacija materiala za smolne zmesi**

Electric cables - Accessories - Material characterization - Part 1: Fingerprinting for resinous compounds

Kabel und isolierte Leitungen - Garnituren - Materialcharakterisierung - Teil 1: Fingerprintprüfungen für Reaktionsharzmassen



Câbles électriques - Accessoires - Caractérisation des matériaux - Partie 1: Essais d'identification pour les composés résineux



**Ta slovenski standard je istoveten z:** **EN 50655-1:2017**

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**ICS:**

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|---|---|---|
| 29.035.20 | Plastični in gumeni izolacijski materiali | Plastics and rubber insulating materials |
| 29.060.20 | Kabli | Cables |

**SIST EN 50655-1:2018** **en**

EUROPEAN STANDARD

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# EN 50655-1

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ICS 29.035.20

Supersedes HD 631.1 S2:2007

English Version

# Electric cables - Accessories - Material characterization - Part 1: Fingerprinting for resinous compounds

Câbles électriques - Accessoires - Caractérisation des matériaux - Partie 1: Essais d'identification pour les composés résineux

Kabel und isolierte Leitungen - Garnituren - Materialcharakterisierung - Teil 1: Fingerprintprüfungen für Reaktionsharzmassen

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European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**



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**Tables**

# European foreword

This document (*EN 50655-1:2017*) has been prepared by CLC/TC 20 "*Electric cables*".

The following dates are fixed:

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|---|---|---|
| – latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2018-09-18 |
| – latest date by which the national standards conflicting with this document have to be withdrawn | (dow) | 2020-09-18 |

This document supersedes HD 631.1 S2:2007.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

EN 50655 series will consist of the following:

– EN 50655-1, *Electric cables - Accessories - Material characterization - Part 1: Fingerprinting for resinous compounds*;

– EN 50655-2, *Electric cables - Accessories - Material characterization - Part 2: Fingerprinting for heat shrinkable components for low and medium voltage applications up to 20,8/36 (42) kV*;

– EN 50655-3, *Electric cables - Accessories - Material characterization - Part 3: Fingerprinting for cold shrinkable components for low and medium voltage applications up to 20,8/36 (42) kV*.



NOTE It has been assumed in the preparation of this document that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

**WARNING** This European Standard calls for the use of substances and/or procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

## 1 Scope

This European Standard specifies the test methods and requirements of tests for fingerprinting (as defined in 3.9) of solvent-free polymerizable, reacting resinous compound intended to be used for electrical insulation and/or mechanical protection in cable accessories covered by EN 50393, HD 629.1 and HD 629.2, for low and medium voltage up to 20,8/36 (42) kV.

Fingerprinting testing of materials does not have a mandatory link to type testing of accessories. It is regarded as stand-alone tests, but it may be carried out in combination with the accessory type tests.

NOTE Information on health and safety is given in Annex A.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50393, *Test methods and requirements for accessories for use on distribution cables of rated voltage 0,6/1,0 (1,2) kV*

EN 60455-1, *Resin based reactive compounds used for electrical insulation - Part 1: Definitions and general requirements (IEC 60455-1)*

EN 60455-2, *Resin based reactive compounds used for electrical insulation - Part 2: Methods of test (IEC 60455-2)*



EN 60455-3-8, *Resin based reactive compounds used for electrical insulation - Part 3: Specifications for individual materials - Sheet 8: Resins for cable accessories (IEC 60455-3-8)*



EN ISO 291, *Plastics - Standard atmospheres for conditioning and testing (ISO 291)*



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

EN ISO 1183-1, *Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pyknometer method and titration method (ISO 1183-1)*

EN ISO 2555, *Plastics - Resins in the liquid state or as emulsions or dispersions - Determination of apparent viscosity by the Brookfield Test method (ISO 2555)*

HD 629.1, *Test requirements on accessories for use on power cables of rated voltage from 3,6/6(7,2) kV up to 20,8/36(42) kV - Part 1: Cables with extruded insulation*

HD 629.2, *Test requirements on accessories for use on power cables of rated voltage from 3,6/6(7,2) kV up to 20,8/36(42) kV - Part 2: Cables with impregnated paper insulation*

IEC 60050-461, *International Electrotechnical Vocabulary - Part 461: Electric cables*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-461 and EN 60455-1 and the following apply.

**3.1**
**resinous compound**
compound for cable accessories made by the mixture of at least two components (resin and reactive component)

Note 1 to entry: For some applications, additional components such as filler may be needed.

**3.2**
**resin**
liquid organic material that cures as a result of polymerization by means of reactive component (e.g. hardener or accelerator) without releasing additional volatile products

**3.3**
**reactive component**
substance or compound of substances which causes, when added to resin, hardening of resin by cross-linking of molecules or accelerates hardening of resin

**3.4**
**pot life**
time available to mix the components of the resinous compound together and pour or inject the compound into the cable accessory, such that it continues to flow smoothly and cohesively

**3.5**
**"use before" date**
**shelf-life**
date until which a resinous compound, when stored under specified conditions of temperature and humidity, retains specified properties

**3.6**
**density**
ratio of mass to volume



**3.7**
**exotherm peak temperature**
highest temperature that is reached during the hardening process of a defined volume of a resinous compound after mixing at a defined temperature



**3.8**
**hardness**
measurement of the resistance of a material to indentation by means of durometers or by penetration of a needle (soft material)

**3.9**
**fingerprinting**
tests made to establish and subsequently confirm the properties of materials or components used in cable accessories

**3.10**
**type test**
tests made on materials or components of a cable accessory in order to demonstrate satisfactory performance characteristics to meet the intended application

**3.11**
**deviation**
variation of a property between the initial test values and the test values measured on new samples at a later date

**3.12**
**initial test**
tests made to establish the properties of materials or components used in cable accessories

## 4 Fingerprinting

### 4.1 General

Tests shall be carried out based on the category of the resinous compound.

## 4.2 Sampling

Samples for fingerprinting shall be taken from material stored under conditions prescribed by the supplier. The fingerprinting test of resinous compound shall be carried out

a) **either** as a stand-alone test. Samples used for the initial test shall be taken from material available as agreed between supplier and user,

b) **or** in combination with an accessory type test. Samples used for the initial test shall be taken from the same batch as those used in the accessory type test. In the event that no material from the same batch is available, the samples used for the initial test shall be taken from material available as agreed between supplier and user.

## 4.3 Preparation and conditioning

### 4.3.1 General

For all tests, unless otherwise specified, conditioning shall be carried out in accordance with EN ISO 291 using atmosphere 23/50.

### 4.3.2 Individual components prior to mixing

Components (resin and reactive component) shall be individually prepared, conditioned and tested in accordance with the relevant test method as specified in stage 1 of the sequence of tests given in Table 1. Filler, when supplied as a separate item, shall not be tested as a component.

### 4.3.3 Resin just after mixing (curing stage)



Compounds shall be prepared according to the supplier's instructions, and then tested as specified in stage 2 of the sequence of tests given in Table 1.

### 4.3.4 Cured resinous compound (original)



Compounds shall be prepared according to supplier's instructions and cured for 24 h at room temperature unless otherwise specified in the test method. The specimens shall be post-cured at (80 ± 2) °C for 24 h unless otherwise specified in the test method and then cooled in a desiccator for 24 h at room temperature.

NOTE If degassing is needed, it will be indicated in the relevant test method and the conditions for the degassing will also be indicated.

Tests shall then be carried out as specified in stage 3 of the sequence of tests given in Table 1.

## 4.4 Sequence of tests

Sequences of tests shall be carried out on the resinous compound in the following three stages, in accordance with Table 1:

– Stage 1: individual components prior to mixing;

– Stage 2: resinous compound just after mixing (curing stage);

– Stage 3: cured resinous compound (original).

## 4.5 Test report

The test report shall include the following data:

1) resinous compound category and identification;

2) name of supplier / manufacturer

3) batch number or identification;

4) marking and labelling according to material safety data sheet (MSDS);

5) test methods and results;

6) major test parameters, including conditioning and calibration, if any;

7) processing conditions to mix the compound;

8) copy of technical data sheet (TDS) and MSDS.