



SLOVENSKI STANDARD SIST HD 631.3 S1:2009

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Electric cables - Accessories - Material characterisation -- Part 3: Fingerprinting for heat shrinkable components for medium voltage applications from 3,6/6 (7,2) kV up to 20,8/36 (42) kV

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Kabel und isolierte Leitungen - Garnituren - Materialcharakterisierung -- Teil 3: Fingerprint-Prüfungen für wärmeschrumpfende Komponenten für Mittelspannungsanwendungen von 3,6/6 (7,2) kV bis 20,8/36 (42) kV

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Câbles électriques - Accessoires - Caractérisation des matériaux -- Partie 3: Essais d'identification des composants thermorétractables pour les applications moyenne tension de 3,6/6 (7,2) kV à 20,8/36 (42) kV

Ta slovenski standard je istoveten z: HD 631.3 S1:2008

ICS:

29.060.20 Kabli Cables

SIST HD 631.3 S1:2009 en,fr,de

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HARMONIZATION DOCUMENT
DOCUMENT D'HARMONISATION
HARMONISIERUNGSDOKUMENT

HD 631.3 S1

July 2008

ICS 29.035.20; 29.060.20

English version

**Electric cables -
Accessories -
Material characterisation -
Part 3: Fingerprinting for heat shrinkable components
for medium voltage applications from 3,6/6 (7,2) kV up to 20,8/36 (42) kV**

Câbles électriques -
Accessoires -
Caractérisation des matériaux -
Partie 3: Essais d'identification
des composants thermorétractables
pour les applications moyenne tension
de 3,6/6 (7,2) kV à 20,8/36 (42) kV

Kabel und isolierte Leitungen -
Garnituren -
Materialcharakterisierung -
Teil 3: Fingerprint-Prüfungen
für wärmeschrumpfende Komponenten
für Mittelspannungsanwendungen
von 3,6/6 (7,2) kV bis 20,8/36 (42) kV

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This Harmonization Document was approved by CENELEC on 2008-06-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document at national level.

Up-to-date lists and bibliographical references concerning such national implementations may be obtained on application to the Central Secretariat or to any CENELEC member.

This Harmonization Document exists in three official versions (English, French, German).

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This Harmonization Document was prepared by a task force under the direction of WG 11 of CENELEC TC 20, Electric cables.

As agreed at the Bruges meeting (June 2007), the text of the draft was submitted to the formal vote and was approved by CENELEC as HD 631.3 S1 on 2008-06-01.

The following dates were fixed:

- latest date by which the existence of the HD has to be announced at national level (doa) 2008-12-01
- latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement (dop) 2009-06-01
- latest date by which the national standards conflicting with the HD have to be withdrawn (dow) 2011-06-01

HD 631 will have 4 parts:

Part 1: Fingerprinting and type tests for resinous compounds

Part 2: Fingerprinting and type tests for heat shrinkable components for low voltage applications

Part 3: Fingerprinting for heat shrinkable components for medium voltage applications from 3,6/6 (7,2) kV up to 20,8/36 (42) kV

Part 4: Fingerprinting for cold shrinkable components for low and medium voltage applications up to 20,8/36 (42) kV

Fingerprinting of sealant components which are delivered as non heat shrinkable items, but that have an important interfacing role, is under consideration.

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 Harmonization Document 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.

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1 Scope

This Harmonization Document specifies the test methods and requirements for fingerprinting (as defined in 3.12) of heat shrinkable components intended to be used in cable accessories for medium voltage, as defined in HD 629.1 and HD 629.2.

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

Component basic functions can be: conductive, stress control or stress grading, insulating, oil barrier, anti-tracking, external protection and sealing. Components are supplied as single layer items or as multi-layer items.

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

2 Normative references

The following referenced documents are indispensable for the application 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.

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
EN ISO 1183 series	Plastics - Methods for determining the density of non-cellular plastics (ISO 1183 series)
EN ISO 11358	Plastics - Thermogravimetry (TG) of polymers - General principles (ISO 11358)
IEC 60050-461	International Electrotechnical Vocabulary (IEV) - Chapter 461: Electric cables
ISO 11357-3	Plastics - Differential scanning calorimetry (DSC) - Part 3: Determination of temperature and enthalpy of melting and crystallization

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply together with those given in IEC 60050-461.

3.1

heat shrinkable

property of a polymeric component previously expanded to recover to its original shape when heated above an appropriate temperature

3.2

heat shrinkable components

expanded polymeric extruded tubings or moulded parts (single or multi-layer), which undergo thermally activated recovery when heated

3.3**multi-layer component**

component which consists of two or more different materials bonded together

3.4**tubing**

tube of heat shrinkable polymeric material cut to a predetermined length

3.5**moulded part**

formed piece of heat shrinkable polymeric material shaped to fit a specific configuration

3.6**conductive component**

component whose material has a defined electrical conductivity

3.7**stress control or stress grading component**

component whose material has defined electrical characteristics to control electrical field

3.8**insulating component**

component whose material has defined electrical characteristics to withstand electrical stress

3.9**oil barrier component**

component whose material has defined material characteristics to prevent migration of cable impregnation compound

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3.10**anti-tracking component**

component whose material has defined material characteristics to resist formation of conductive paths by surface electrical activity

3.11**sealant component**

component which, when used in conjunction with heat shrink components, forms a barrier along interfaces. It can be in the form of mastic, putty, grease or adhesive

3.12**fingerprinting**

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

3.13**deviation**

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

3.14**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 on heat shrinkable components as defined in Table 1.

4.2 Sampling

Samples for fingerprinting shall be taken from material stored under conditions prescribed by the supplier. The fingerprinting test on heat shrinkable components shall be carried out either

- a) as a stand-alone test. Samples used for the initial test shall be taken from material available with or without sealant as agreed between supplier and user, or
- b) 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 with or without sealant. 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

After full recovery in an air circulating oven at $(200 \pm 5) ^\circ\text{C}$ for 20_0^{+5} min, original components shall be individually prepared and conditioned in accordance with relevant test methods. For multilayer components the material samples shall be taken from individual layers.

4.4 Tests

Components shall be tested in accordance with the tests methods specified in Table 1.

4.5 Test report

The test report shall include the following data:

- 1 part number or identification;
- 2 batch number and/or manufacturing date;
- 3 test methods and results;
- 4 copy of the technical data sheet (TDS) and material safety data sheet (MSDS), if any (refer to Annex A);
- 5 major test parameters, including conditioning and calibration.

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Table 1 - Test methods and requirements

Material / Component property	Test method	Unit	Requirements	
			Deviation	Comments
Dimensions after full recovery ^a - Inner diameter (d_1) - Wall thickness (W_c)	Annex B	mm mm	$\pm 5 \%$ $\pm 7,5 \%$	
Density	EN ISO 1183 series	g/cm^3	$\pm 5 \%$	Measured without sealant and for multi-layer each individual layer shall be measured.
Differential scanning - Calorimetry (DSC) ^b	ISO 11357-3	$^{\circ}\text{C}$	$\pm 5 \text{ K}$	Measured without sealant and for multi-layer each individual layer shall be measured.
Thermogravimetric analysis (TGA) ^b Polymer: - Weight loss - Mean temperature Carbon black: - Weight loss - Mean temperature Filler: - Weight loss - Mean temperature	EN ISO 11358	 % $^{\circ}\text{C}$ % $^{\circ}\text{C}$ % $^{\circ}\text{C}$	 $\pm 10 \%$ $\pm 15 \text{ K}$ $\pm 10 \%$ $\pm 15 \text{ K}$ $\pm 10 \%$ $\pm 15 \text{ K}$	Measured without sealant and for multi-layer each individual layer shall be measured.
^a Test shall be performed on the component as received. For multi-layer components the value for each layer shall be recorded separately, where relevant. For nominal value refer to product data sheet. ^b Test sequence and conditions shall be clearly recorded in the test report. The same sequence and conditions shall be used when the test is re-conducted.				