SLOVENSKI STANDARD
SIST HD 631.2 S1:2008

01-junij-2008

Elektriļ ni kabli - Pribor - Znaļ ilnosti materialov - 2. del: Identifikacija materiala in tipski preskusi za toplotno skrļ ljive sestavne dele za uporabo v nizkonapetostnih sistemih

Electric cables - Accessories - Material characterisation - Part 2: Fingerprinting and type tests for heat shrinkable components for low voltage applications

Kabel und isolierte Leitungen - Garnituren - Materialcharakterisierung - Teil 2: Fingerprint - und Typprüfungen für wärmeschrumpfende Komponenten für Niederspannungsanwendungen

Câbles électriques - Accessoires - Caractérisation des matériaux - Partie 2: Essais d'identification et essais de type pour les composants thermorétractables pour les applications basse tension

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ICS:

29.035.20	Plastiļ ni in gumeni izolacijski materiali	Plastics and rubber insulating materials
29.060.20	Kabli	Cables

SIST HD 631.2 S1:2008 **en,fr,de**

HARMONIZATION DOCUMENT

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

HD 631.2 S1

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ICS 29.035.20

English version

Electric cables - Accessories - Material characterisation - Part 2: Fingerprinting and type tests for heat shrinkable components for low voltage applications

Câbles électriques - Accessoires - Caractérisation des matériaux - Partie 2: Essais d'identification et essais de type pour les composants thermorétractables pour les applications basse tension

Kabel und isolierte Leitungen - Garnituren - Materialcharakterisierung - Teil 2: Fingerprint- und Typprüfungen für wärmeschrumpfende Komponenten für Niederspannungsanwendungen

This Harmonization Document was approved by CENELEC on 2007-09-01. 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).

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CENELEC

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

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Foreword

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

The text of the draft was submitted to the formal vote and was approved by CENELEC as HD 631.2 S1 on 2007-09-01.

The following dates were fixed:

– latest date by which the existence of the HD has to be announced at national level	(doa)	2008-03-01
– latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement	(dop)	2008-09-01
– latest date by which the national standards conflicting with the HD have to be withdrawn	(dow)	2010-09-01

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

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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Contents

1 Scope

This Harmonisation Document specifies the test methods and requirements for

a) fingerprinting (as defined in 3.7),

b) type testing (as defined in 3.8).

of heat shrinkable components intended to be used for electrical insulation or electrical insulation and mechanical protection in cable accessories for low voltage, as defined in EN 50393.

Fingerprinting and type testing of materials do not have a mandatory link to type testing of accessories. They shall be regarded as stand-alone tests, but can 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 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.

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

EN 60243-1, *Electrical strength of insulating materials — Test methods — Part 1: Test at power frequencies (IEC 60243-1)*

EN 60296, *Fluids for electrotechnical applications - Unused mineral insulating oils for transformers and switchgear (IEC 60296)*

EN 60684-2, *Flexible insulating sleeving - Part 2: Methods of test (IEC 60684-2)*

EN 60811-2-1, *Insulating and sheathing materials of electric and optical cables – Common test methods – Part 2-1: Methods specific to elastomeric compounds – Ozone resistance, hot set and mineral oil immersion tests (IEC 60811-2-1)*

HD 429, *Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials (IEC 60093)*

EN 1426, *Bitumen and bituminous binders - Determination of needle penetration*

EN 1465, *Adhesives. Determination of tensile lap-shear strength of rigid-to-rigid bonded assemblies (ISO 4587, mod.)*

EN ISO 62, *Plastics - Determination of water absorption (ISO 62)*

EN ISO 527-2, *Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2)*

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

EN ISO 1183 series, *Plastics - Method for determining the density of noncellular plastic (ISO 1183 series)*

EN ISO 11358, *Plastics - Thermogravimetry (TG) of polymers - General principles (ISO 11358)*

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

ISO 8013, *Rubber, vulcanized - Determination of creep in compression*

ISO 11357-3, *Plastics - Differential scanning calorimetry (DSC) - Part: 3 Determination of temperature and enthalpy of melting and crystallisation*

ASTM E28-99:2004, *Standard test methods for softening point of resins derived from naval stores by ring-and-ball apparatus*

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

3.2
heat shrinkable component
expanded polymeric extruded tubing or moulded part which undergoes thermally activated recovery when heated to an appropriate temperature

3.3
tubing
tube of heat shrinkable polymeric material cut to a predetermined length

3.4
wraparound sleeve
flat sheet of heat shrinkable polymeric material, which can be wrapped to form tubing

3.5
moulded part
formed piece of heat shrinkable polymeric material shaped to fit specific configuration

3.6
sealant
material, which when used in conjunction with heat shrinkable components, forms a barrier along interfaces

NOTE The sealant (for example holt melt or mastic) may be pre-coated on the heat shrink component or applied separately.

3.7
fingerprinting
tests made to establish and subsequently confirm the properties of materials or components used in cable accessories

3.8
type test
tests made on the material or component of a cable accessory in order to demonstrate satisfactory performance characteristics to meet the intended application

3.9
deviation
variation of a property between the initial test values and test values measured on new samples at a later date

3.10
intial test
tests made to establish the properties of materials or components used in cable accessories

4 Fingerprinting

4.1 General

Tests shall be carried 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 of 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 ± 5) °C for 20^{+5}_{0} min, original components shall be individually prepared and conditioned in accordance with relevant test methods. For components with sealant, the sealant shall be removed when required (as specified in the remarks column of Table 1), before running the test.

4.4 Tests

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

4.5 Test report

The test report shall include the following data:

a) part number or identification;

b) batch number and/or manufacturing date;

c) tests method and results;

d) copy of technical data sheet (TDS) and material safety data sheet (MSDS), if any (refer to Annex A);

e) major test parameters, including conditioning and calibration.

Table 1 - Fingerprinting: Test methods and requirements

Material property	Test method	Unit	Requirements	
			Deviation	Comments
Dimensions after full recovery [a]	Annex B			
- Inner diameter (d_1)		mm	(+0/-10) %	
- Wall thickness (W_c)		mm	(+0/-10) %	
Density (measured without sealant)	EN ISO 1183	g/cm^3	± 5 %	
Differential scanning calorimetry (DSC) [b]	ISO 11357-3			
- Measured without sealant		°C	± 5 K	
- Measured with sealant		°C	± 5 K	
Thermal gravimetric analysis (TGA) [b]	EN ISO 11358			
Polymer:				Measured without sealant
Weight loss		%	± 10 %	
Mean temperature		°C	± 15 K	
Carbon black:				Measured without sealant
Weight loss		%	± 10 %	
Mean temperature		°C	± 15 K	
Content		%	≥ 2,5	
Filler:				Measured without sealant
Weight loss		%	± 10 %	
Mean temperature		°C	± 15 K	
Sealant:				
Weight loss		%	± 10 %	
Mean temperature		°C	± 15 K	

[a] Test to be run on component as received. For nominal value, refer to the product data sheet.

[b] Test sequence and conditions shall be clearly recorded in the test reports. The same sequence and conditions shall be used when the test is re-conducted; calibration details and the equipment type and model shall be the same.

5 Type tests

5.1 General

Tests shall be carried out based on the category of the heat shrinkable components as defined in Table 1. These tests are of such a nature that, once successfully completed, they need not be repeated unless changes are made in the material, component formulation or manufacturing process, which might change the performance characteristics.