

Električni kabli – Pribor – Značilnosti materialov – 4. del: Fingerprinting za hladno skrčljive sestavne dele za uporabo v nizko- in sredjenapetostnih sistemih do vključno 20,8/36(42) kV

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

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

Câbles électriques - Accessoires -
Caractérisation des matériaux
Partie 4: Cartographie des composants
rétractables à froid pour les applications
basse et moyenne tension
jusqu'à 20,8/36(42) kV

Kabel und isolierte Leitungen - Garnituren -
Materialcharakterisierung
Teil 4: Fingerprintprüfungen
für kaltschrumpfende Komponenten für
Nieder- und Mittelspannungsanwendungen
bis 20,8/36(42) kV

This draft Harmonization Document is submitted to CENELEC members for CENELEC enquiry.
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It has been drawn up by CENELEC TC 20.

If this draft becomes a Harmonization Document, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

This draft Harmonization Document was established by CENELEC in three official versions (English, French, German).

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CENELEC

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Foreword

This draft Harmonization Document was prepared by a Task Force under the direction of WG 11 of CENELEC TC 20, Electric cables. As agreed at the Athens meeting (May 2006) it is submitted to CENELEC enquiry (5MP).

This is Part 4 of HD 631 Electric cables – Accessories – Material characterisation.

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 cold 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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Draft for ENQUIRY

1 Scope

This Harmonization Document specifies the test methods and requirements for fingerprinting (as defined in 3.9) of cold shrinkable components intended to be used in cable accessories for low and medium voltage, as defined in EN 50393, 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 can 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. They are supplied as single layer item or as multi-layer item, which combines two or more functions.

Components are generally supplied pre-expanded or with a system allowing expansion prior to installation.

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 ISO 11358	Plastics - Thermogravimetry (TG) of polymers - General principles
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
ISO 2781	Rubber, vulcanized - Determination of density
IEC 60050-461	International Electrotechnical Vocabulary (IEV) Chapter 461: Electric cables

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

cold shrinkable

property of an elastomeric component previously expanded to recover to its original shape at ambient temperature after removal of the means of support

3.2

cold shrinkable components

elastomeric extruded tubings or moulded parts (single or multilayer) pre-expanded on a support or expanded prior to installation, which tend to recover to their original dimensions when the support is removed

3.3

multi-layer component

component which consists of minimum two different materials bonded together.

3.4

conductive component

component which has a defined electrical conductivity

3.5

stress control or stress grading component

component which has defined electrical characteristics to control electrical field

3.6

insulating component

component which has defined electrical characteristics to withstand electrical stress

3.7

oil barrier component

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

3.8

anti-tracking component

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

3.9

sealant component

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

3.10

external protection component

component providing protection against the environment

3.11

fingerprinting

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

3.12

deviation

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

3.13

initial test

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

3.14**mechanically assembled cold shrink components**

mechanical superposition of at least two cold shrinkable components on one support

4 Fingerprinting**4.1 General**

Tests shall be carried on cold 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 cold 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 kit as those used in the accessory type test with or without sealant. In the event that no material from the same kit 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

Original components shall be individually prepared and conditioned in accordance with relevant test method conditions. For multilayer components, the material samples shall be taken from individual layers.

4.4 Tests

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

4.5 Test report

The test report shall include the following data:

- 1 part number or identification;
- 2 lot 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;
- 6 expansion date (mm/yy) of component.

Table 1 - Test methods and requirements

Material / Component property	Test method	Unit	Requirements	
			Deviation	Comments
Support dimensions: - Inner diameter - Outer diameter		mm	± 2 % ± 2 %	
Weight ^a		g	± 5 %	
Shrink test ^b Under review	See Annex B		Under consideration	Under review
Density	ISO 2781	g/cm ³	± 5 %	For multilayer each individual layer shall be measured.
Thermogravimetric analysis (TGA) ^c Polymer: - Weight loss - Mean temperature Carbon black: - Weight loss - Mean temperature Filler: - Weight loss - Mean temperature	EN ISO 11358	% °C % °C % °C	± 10 % ± 15 K ± 10 % ± 15 K ± 10 % ± 15 K	For multilayer each individual layer shall be measured.
^a All mechanically assembled cold shrinkable components to be weighed separately. ^b Measurement shall be made 24 h after removal of the support and free shrinking of the component at ambient temperature. ^c 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.				

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