
Kabelske objemke za električne inštalacije

Cable cleats for electrical installations

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Cable cleats for electrical installations

Brides de câbles pour installations
électriques

Kabelhalter für elektrische Installationen

This European Standard was approved by CENELEC on 2003-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and 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 European Standard was prepared by the Technical Committee CENELEC TC 213, Cable management.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50368 on 2003-09-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-09-01

Annexes designated "informative" are given for information only. In this standard, Annexes A and B are informative.

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1 Scope

This European Standard specifies requirements and tests for cable cleats used for cable fixing, retention and support in electrical installations up to 1 000 V a.c. and/or 1 500 V d.c. and which, if declared, provide resistance to electromechanical forces. This standard does not apply to cable glands, cable ties or devices that rely on the mounting surface for cable retention or devices covered by other standards.

Certain cable cleats may be suitable for use in association with cables operating outside the above-mentioned voltages; regard shall then be taken of extra requirements which may be necessary.

2 Normative references

This European Standard incorporates, by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

<u>Publication</u>	<u>Year</u>	<u>Title</u>
EN 60695-2-2	1994	Fire Hazard testing - Part 2: Test methods - Section 2: Needle-flame test (IEC 60695-2-2:1991)
EN 60909-0	2001	Short-circuit currents in three-phase a.c. systems - Part 0: Calculation of currents (IEC 60909-0:2001)
EN ISO 4287	1998	Geometrical product specification (GPS) - Surface texture: Profile method - Terms, definitions and surface texture parameters (ISO 4287:1997)
EN ISO 868	1997	Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:1985)
IEC 61363-1	1998	Electrical installations of ships and mobile fixed offshore units - Part 1: Procedures for calculating short-circuit currents in three phase a.c.

3 Definitions

For the purpose of this European Standard, the following definitions apply:

3.1

cable cleat

a device designed to provide in itself, or with the system component(s) it is designed to fit to, retention and support of cables and installed at intervals along the length of the cable. A cable cleat is provided with a means of attachment to a mounting surface but does not rely on the mounting surface for the retention of the cables

3.2

intermediate restraint

a cable retaining device, which is designed to be used with cable cleats, that is not attached to the support structure and that holds the cables together

3.3

metallic cable cleat

a cable cleat consisting of metal only

3.4

non-metallic cable cleat

a cable cleat consisting of non-metallic material only

3.5

composite cable cleat

a cable cleat comprising metallic and non-metallic materials

3.6

non-flame propagating cable cleat

a cable cleat which may or may not ignite as a result of an applied flame but does not propagate fire

3.7

metallic intermediate restraint

an intermediate restraint consisting of metal only

3.8

non-metallic intermediate restraint

an intermediate restraint consisting of non-metallic material only

3.9

composite intermediate restraint

an intermediate restraint comprising metallic and non-metallic materials

3.10

non-flame propagating intermediate restraint

an intermediate restraint which may or may not ignite as a result of an applied flame but does not propagate fire

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3.11

electrical fault

a circuit condition in which the current flows through an abnormal or unintended path. This may result from an insulation failure or the bridging of insulation. Conventionally, the impedance between live conductors or between live conductors and extraneous conductive parts at the fault position is considered negligible

3.12

fault current

a current resulting from an electrical fault

3.13

short-circuit current

an overcurrent resulting from an electrical fault of negligible impedance between live conductors or between a live conductor and an earth, having a difference in potential under normal operating conditions

3.14

peak short-circuit current i_p

the maximum possible instantaneous value of the short-circuit current (see Annex B)

3.15

initial RMS symmetrical short-circuit current I''_k

the RMS value of the a.c. symmetrical component of a short-circuit current, applicable at the instant of the short-circuit if the impedance remains at zero-time value (see Annex B)

3.16**decaying (aperiodic) component of short-circuit current $i_{d.c.}$**

mean value between the top and bottom envelope of a short-circuit current decaying from an initial value to zero (see Annex B)

3.17**steady-state short-circuit current I_k**

the RMS value of the short circuit current which remains after the decay of the transient phenomena (see Annex B)

3.18**trefoil formation**

a symmetrical triangular arrangement of three cables which may be in contact with each other (see Figure 5)

3.19**side-by-side formation**

an arrangement in which the cables are laid in a flat formation. The cables may be in contact (see Figure 6)

3.20**bundled formation**

a group of four or more cables held together

3.21**electromechanical forces**

the induced forces acting on current carrying conductors

3.22**retention**

the ability of a cable cleat to limit the axial and lateral movement of the cable

3.23**environmental influences**

the effect of corrosive or polluting substances or solar radiation, etc.

4 General requirements

4.1 Cable cleats shall be so designed and constructed that safe handling is ensured and that safe retention and support for the cable(s) is provided.

4.2 Intermediate restraints shall be so designed and constructed that safe handling is ensured and that a safe means is provided for holding cables together.

5 General notes on tests

5.1 Tests according to this standard are type tests. Where there are a number of sizes in the range, the manufacturer or responsible vendor may define classes (products of the same declared ability but varying dimensionally) and in this case, only the most critical size in each class shall be tested.

5.2 Unless otherwise specified, all tests shall be carried out on new samples with the cable cleats and intermediate restraints where used, assembled and installed according to the manufacturer's or responsible vendor's instructions.

Tests on non-metallic and composite cable cleats and intermediate restraints where used shall not commence earlier than 168 hours after manufacture.

5.3 Unless otherwise specified, the tests shall be carried out at an ambient temperature of (25 ± 5) °C and a relative humidity between 40 % and 60 %.

5.4 Unless otherwise specified, three samples are subjected to the tests and the requirements are satisfied if all the tests are met. If only one of the samples does not satisfy a test due to a manufacturing fault, then that test and any preceding one which may have influenced the results of the test shall be repeated and also the tests which follow shall be made in the same required sequence on another full set of samples, all of which shall comply with the requirements.

NOTE The applicant, when submitting the first set of samples, may also submit an additional set of samples which may be necessary should one sample fail. The test house shall then, without further request, test the additional set of samples and shall only reject if a further failure occurs. If the additional set of samples is not submitted at the same time, a failure of one sample shall entail rejection.

5.5 When toxic or hazardous processes are used, due regard shall be taken of the safety of persons within the test area.

6 Classification

6.1 According to material

6.1.1 Metallic

6.1.2 Non-metallic

6.1.3 Composite

6.2 According to resistance to impact

6.2.1 Very light

6.2.2 Light

6.2.3 Medium

6.2.4 Heavy

6.2.5 Very heavy

6.3 According to resistance to electromechanical forces

6.3.1 Non-resistant to electromechanical forces

6.3.2 Resistant to electromechanical forces

The manufacturer or responsible vendor shall declare the category of the cable cleat as follows:

6.3.2.1 capable of withstanding one short-circuit

6.3.2.2 capable of withstanding two short-circuits without any adjustment of the cleats and/or intermediate restraints between short-circuits

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The manufacturer or responsible vendor shall also declare

- the peak short-circuit current and the initial RMS symmetrical short-circuit current,
- the arrangement showing the maximum spacing between cleats and intermediate restraints, where used.

6.4 According to temperature

Table 1 - Temperature for permanent application

A. Maximum temperature °C
+40
+60
+85
+105
+120
+150
+250
B. Minimum temperature °C
-5
-15
-25
-40
-60

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NOTE For temperature values above 250 °C and below -60 °C, the manufacturer or responsible vendor may declare temperatures outside the values tabulated above.

6.5 According to flame application time

This is given in Table 2 for non-metallic and composite cable cleats and non-metallic and composite intermediate restraints.

Table 2 - Flame application time

Application time s
5
10
20
30
60
120

6.6 According to response to environmental influences

Under consideration.

7 Marking and documentation

7.1 Marking

Each cable cleat and intermediate restraint shall be marked with

- the manufacturer's or responsible vendor's name or logo or trademark,
- product identification or type.

Where it is not possible to make these marks directly onto the product, then the marks shall be on the smallest supplied package.

7.2 Durability and legibility

Marking on the product shall be durable and easily legible.

Compliance is checked by inspection and by rubbing the marking by hand for 15 seconds with a piece of cloth soaked with water and again for 15 seconds with a piece of cloth soaked with petroleum spirit.

Marking made by moulding, pressing or engraving is not subjected to this test.

After the test, the marking shall be legible.

NOTE 1 Petroleum spirit is defined as the aliphatic solvent hexane with a content of aromatics of maximum 0,1 % by volume, a kauri-butanol value of 29, initial boiling point of 65 °C, a dry point of 69 °C and a specific gravity of 0,68 kg/l.

NOTE 2 Marking may be applied, for example, by moulding, pressing, engraving, printing, adhesive labels, etc...

7.3 Documentation

The manufacturer or responsible vendor shall provide in his literature

- the classifications according to Clause 6,
- the maximum and minimum cable or bundle diameters,
- the method of assembly and installation (where appropriate),
- the maximum lateral load,
- the maximum axial movement load.

Compliance is checked by inspection.

8 Construction

The surface of the cable cleat and intermediate restraint, where used, shall be free from burrs, flash and similar inconsistencies which are likely to damage the cables or inflict injury to the installer or user.

Compliance is checked by visual and manual inspection.