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Cable trunking systems and cable ducting systems for electrical installations - Part 1: General requirements

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Cable trunking systems and cable ducting systems for electrical installations Part 1: General requirements

Systèmes de goulottes et de conduits profilés pour installations électriques Partie 1: Règles générales

Elektroinstallationskanalsysteme für elektrische Installationen Teil 1: Allgemeine Anforderungen

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

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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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 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 50085-1 on 2005-04-01.

This European Standard supersedes EN 50085-1:1997 + A1:1998.

NOTE EN 50085-1:1997 + A1:1998 will remain valid as long as Part 2-3 has not been aligned with the second edition of Part 1.

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)	2006-04-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	–*

* Open, depending on revision of Part 2-3, to be aligned with this Part 1.

This standard is a system standard for cable management products used for electro-technical purposes. It relates to the Council Directives on the approximation of laws, regulations and administrative provisions of the Member States relating to the Low Voltage Directive 73/23/EEC through consideration of the essential requirements of this directive.

This standard is supported by separate standards to which references are made.

Contents

1 Scope

This European Standard specifies requirements and tests for cable trunking systems (CTS) and cable ducting systems (CDS) intended for the accommodation, and where necessary for the electrically protective separation, of insulated conductors, cables and possibly other electrical equipment in electrical and/or communication systems installations. The maximum voltage of these installations is 1 000 V a.c. and 1 500 V d.c.

This standard does not apply to conduit systems, cable tray systems, cable ladder systems, power track systems or equipment covered by other standards.

This Part 1 shall be used in conjunction with the relevant Part 2 for particular requirements.

NOTE This Part 1 is not intended to be used by itself.

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 22768-1	1993	General tolerances - Part 1: Tolerances for linear and angular dimensions without individual tolerance indications (ISO 2768-1:1989)
EN 50085-2	Series	Cable trunking systems and cable ducting systems for electrical installations - Part 2: Particular requirements
EN 50102 + A1	1995 1998	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)
EN 60423	1994	Conduits for electrical purposes - Outside diameters of conduits for electrical installations and threads for conduits and fittings (IEC 60423:1993, modified)
EN 60529	1991	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
EN 60695-2-4/1	1993	Fire hazard testing - Part 2: Test methods - Section 4/Sheet 1: 1 kW nominal pre-mixed test flame and guidance (IEC 60695-2-4/1:1991)
EN 60695-2-11	2001	Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end-products (IEC 60695-2-11:2000)
EN 61032	1998	Protection of persons and equipment by enclosures - Probes for verification (IEC 61032:1997)
HD 383 S2	1986	Conductors of insulated cables (IEC 60228:1978 + IEC 60228A:1982)
HD 384.1 S1	1979	Electrical installations of buildings (IEC 60364:1:1972 + A1:1976, modified)

HD 384.5.51 S1	1985	Part 5: Selection and erection of electrical equipment - Chapter 51: Common rules (IEC 60364-5-51:1979, modified)
HD 384.5.54 S1	1988	Chapter 54: Earthing arrangements and protective conductors (IEC 60364-5-54:1980, modified)
IEC 60050-826	2004	International Electrotechnical Vocabulary (IEV) - Part 826: Electrical installations
IEC 60417	database	Graphical symbols for use on equipment

3 Definitions

For the purpose of this European Standard the following definitions apply.

3.1
cable trunking system (CTS)
assembly comprising a trunking length and possibly other system components to provide an enclosure for the accommodation and laying in of insulated conductors and cables and possibly the accommodation of other electrical equipment

NOTE Different types of CTS are shown in Figure 1 and explained in Annex A.

3.2
cable ducting system (CDS)
assembly comprising a ducting length and possibly other system components to provide an enclosure for the accommodation and drawing in of insulated conductors and cables and possibly the accommodation of other electrical equipment

NOTE Different types of CDS are shown in Figure 1 and explained in Annex A.

3.3
system component
part of the system which includes

a) trunking length or ducting length,

b) trunking fitting or ducting fitting,

c) fixing device,

d) apparatus mounting device,

e) system accessory

NOTE A system does not necessarily include all system components a) to e). Different combinations of system components may be used.

3.4
trunking length
main component of a cable trunking system comprising a base with one or more access covers which may be opened or removed

3.5
ducting length
main component of a cable ducting system, characterized by a closed non-circular cross section

3.6
fitting
system component to connect, change direction or terminate trunking lengths or ducting lengths

3.7
fixing device
system component to secure other system components to the wall, ceiling, floor or other structure

3.8
apparatus mounting device
system component to accommodate electrical apparatus (switches, socket outlets, circuit-breakers, telephone outlets, etc...) which can be an integral part of electrical apparatus

NOTE An apparatus mounting device can also be a fitting, a trunking length, etc...

3.9
system accessory
system component which provides a supplementary function

NOTE Examples of system accessories are partition, cable retainer, cable outlet, etc.

3.10
metallic system component
system component which consists of metal only

3.11
non-metallic system component
system component which consists of non-metallic material only

3.12
composite system component
system component comprising both metallic and non-metallic materials

3.13
non-flame propagating system component
system component which is liable to catch fire as a result of an applied flame, in which the flame does not propagate and which extinguishes itself within a limited time after the flame is removed

3.14
external influence
factor which may affect the system

3.15
Void

3.16
gland
device designed to permit the entry of a cable or flexible cable into equipment, and which provides sealing and retention. It may also provide other functions such as earthing, bonding, insulation, cable guarding, strain relief or a combination of these

3.17
live part
conductor or conductive part intended to be energized in normal operation, including a neutral conductor, but by convention not a PEN conductor or PEM conductor or PEL conductor
[IEV 826-12-08, mod.]

3.18
cable anchorage
system accessory to relieve conductors in terminals and terminations from strain by resisting the pull and twist forces on cable

3.19
cable restrainer
system accessory to relieve conductors in terminals and terminations from strain by resisting the pull force on cable or insulated conductors

3.20
cable retainer
system accessory for the retention of insulated conductors or cables to prevent them from falling out when the access cover is opened or removed

3.21
grommet
component or an integral part of an enclosure to support and protect the cable, conduit or ducting or trunking at the point of entry. It may also prevent the ingress of moisture or contaminants (see Figure 7)

3.22
entry membrane
component or an integral part of an enclosure to protect the cable, and may be used to support the cable, conduit or ducting or trunking at the point of entry. It may also prevent the ingress of moisture or contaminants. An entry membrane may be part of a grommet (see Figure 7)

3.23
protecting membrane
component or an integral part of an enclosure, not to be penetrated in normal use, to provide protection against ingress of water or solid objects and/or to allow the operation of an accessory (see Figure 7)

3.24
gasket
additional part or material or an integral part placed between mating surfaces of an enclosure which in compression contributes to the achievement of the declared ingress protection

3.25
reaction to fire
response of a CTS/CDS in contributing by its own decomposition to a fire, to which it is exposed, under specified conditions

3.26
fire resistance
ability of a CTS/CDS to fulfil for a stated period of time the required stability and/or integrity and/or thermal insulation, and/or other expected duty specified in a standard fire resistance test

NOTE Fire resistant (adjective) refers only to this ability.

3.27
skirting CTS/CDS
CTS/CDS intended to be installed on the lower part of a wall

3.28
dry-treatment of floor
process for cleaning and/or care by which the floor is treated without liquids or with only a small quantity of liquid. The required agents are applied and spread in such quantities that no pools are formed and soaking of the floor covering does not occur

NOTE Examples for dry treatment are: Sweeping with a broom or carpet-sweeper, vacuum cleaning, brushing, cleaning with a dry cleaning powder, dry shampoo treatment, wet shampooing of carpets, treatment with cleaning litter (liquid chemical cleaning agent on a solid material used as carrier, e.g. soaked sawdust, damp cloth, etc.)

3.29
wet-treatment of floor
process for cleaning and/or care by which the floor is treated with liquid agents such that pools of liquid, or soaking of the floor covering for a brief period of time, cannot be excluded

NOTE Examples of wet treatment are: wet scrubbing, manual or mechanical wiping.

3.30
(conductive) screen
conductive part that encloses or separates electric circuits and/or conductors
[IEV 195-02-38]

3.31
(electrically)protective screen
conductive screen used to separate an electric circuit and/or conductors from hazardous-live-parts
[IEV 195-06-17]

3.32
(electrically) protective screening
separation of electric circuits or conductors from hazardous-live-parts by an electrically protective screen connected to the protective-equipotential-bonding system and intended to provide protection against electric shock
[IEV 195-06-18]

3.33
(electrically) protective separation
separation of one electric circuit from another by means of:

– double insulation; or

– basic insulation and electrically protective screening; or

– reinforced insulation
[IEV 195-06-19]

3.34
partition (of an assembly)
part of an assembly separating one compartment from other compartments
[IEV 441-13-6]

3.35
internal protective partition
partition which when used in combination with basic insulation provides electrically protective separation between compartments of the CTS/CDS

4 General requirements

CTS/CDS shall be so designed and constructed that where required they provide reliable mechanical protection to the insulated conductors, cables and possibly other electrical equipment contained therein. Where required the system shall also provide adequate electrical protection.

Furthermore, the system components shall withstand the stresses likely to occur under classified minimum temperature for storage and transport, installation and application (see Tables 1 and 2) and maximum temperature for application (see Table 3) and during recommended installation practice and usage.

Equipment associated with or incorporated in a system component but which is not a system component, shall and need only comply with the relevant standard of this equipment, if any. However it may be necessary to include such equipment in a test arrangement for the purpose of testing its interface with the CTS/CDS.

Compliance is checked by carrying out all the tests specified.

5 General conditions for tests

5.1 Tests according to this standard are type tests.

5.2 Samples of system components are called, hereafter samples.

5.3 Unless otherwise specified, tests are carried out, considering the declared classification and functions of the system, with the CTS/CDS assembled and installed as in normal use according to the manufacturer's instructions.

Tests on non-metallic system components or composite system components shall not commence earlier than 168 h after manufacture. During this period the samples may be aged according to 10.3.1.1 when required.

5.4 Unless otherwise specified, the tests are carried out at an ambient temperature of 20 °C ± 5 °C.

5.5 Samples of trunking lengths or ducting lengths for a given test are taken from different such system components.

5.6 Unless otherwise specified, all tests are carried out on new samples.

5.7 When toxic or hazardous processes are used, precautions shall be taken to safeguard the test personnel.

5.8 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 an assembly or a manufacturing fault, 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 carried out in the required sequence on another full set of samples, all of which shall comply with the requirements.

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

6 Classification

6.1 According to material

Void.

6.2 According to resistance to impact for installation and application

6.2.1 CTS/CDS for impact 0,5 J.

6.2.2 CTS/CDS for impact 1 J.

6.2.3 CTS/CDS for impact 2 J.

6.2.4 CTS/CDS for impact 5 J.

6.2.5 CTS/CDS for impact 20 J.

6.3 According to temperatures as given in Tables 1, 2 and 3

Table 1 – Minimum storage and transport temperature

Minimum storage and transport temperature ± 2 °C
- 45
- 25
- 15
- 5

Table 2 – Minimum installation and application temperature

Minimum installation and application temperature ± 2 °C
- 25
- 15
- 5
+ 5
+ 15

Table 3 – Maximum application temperature

Maximum application temperature ± 2 °C
+ 60
+ 90
+ 105
+ 120

NOTE The above application temperatures are operating temperatures and not ambient temperatures.

6.4 According to resistance to flame propagation

6.4.1 Flame propagating CTS/CDS.

6.4.2 Non-flame propagating CTS/CDS.

6.5 According to electrical continuity characteristic

6.5.1 CTS/CDS with electrical continuity characteristic.

6.5.2 CTS/CDS without electrical continuity characteristic.

6.6 According to electrical insulating characteristic

6.6.1 CTS/CDS without electrical insulating characteristic.

6.6.2 CTS/CDS with electrical insulating characteristic.

NOTE The electrical insulating characteristic provides supplementary insulation when used with insulated conductors and other live parts, if any, provided with basic insulation.

6.7 According to degrees of protection provided by enclosure according to EN 60529:1991

6.7.1 According to protection against ingress of solid foreign objects

IP4X or any higher degree of protection shall not be declared when it relies on butt joint or the accuracy of cutting of ducting lengths or trunking lengths or access covers without providing relevant fittings or assembly means or additional factory prefabricated sealing means.

6.7.2 According to protection against ingress of water

IPX1 or any higher degree of protection shall not be declared when it relies on butt joint or the accuracy of cutting of ducting lengths or trunking lengths or access covers without providing relevant fittings or assembly means or additional factory prefabricated sealing means.

6.7.3 According to protection against access to hazardous parts

IPXX-D shall not be declared when it relies on butt joint or the accuracy of cutting of ducting lengths or trunking lengths or access covers without providing relevant fittings or assembly means or additional factory prefabricated sealing means.

6.8 According to protection against corrosive or polluting substances

6.8.1 CTS/CDS with low protection outside and inside.

6.8.2 CTS/CDS with medium protection outside, and low protection inside.

6.8.3 CTS/CDS with medium protection outside and inside.

6.8.4 CTS/CDS with high protection outside, and low protection inside.

6.8.5 CTS/CDS with high protection outside, and medium protection inside.

6.8.6 CTS/CDS with high protection outside and inside.