

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Cable trunking systems and cable ducting systems for electrical installations –
Part 2-1: Particular requirements – Cable trunking systems and cable ducting
systems intended for mounting on walls and ceilings**

IEC 61084-2-1:2017
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IEC 61084-2-1:2017
**Systemes de goulottes et systemes de conduits-profilés pour installations
électriques –
Partie 2-1: Exigences particulières – Systemes de goulottes et systemes de
conduits-profilés prévus pour être montés sur les murs et les plafonds**



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NORME INTERNATIONALE

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Part 2-1: Particular requirements – Cable trunking systems and cable ducting
systems intended for mounting on walls and ceilings**

**Systèmes de goulottes et systèmes de conduits-profilés pour installations
électriques –**

**Partie 2-1: Exigences particulières – Systèmes de goulottes et systèmes de
conduits-profilés prévus pour être montés sur les murs et les plafonds**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CABLE TRUNKING SYSTEMS AND CABLE DUCTING
SYSTEMS FOR ELECTRICAL INSTALLATIONS –****Part 2-1: Particular requirements – Cable trunking systems and cable
ducting systems intended for mounting on walls and ceilings**

FOREWORD

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International Standard IEC 61084-2-1 has been prepared by subcommittee 23A: Cable management systems, of IEC technical committee 23: Electrical accessories.

This second edition cancels and replaces the first edition published in 1996. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- classification;
- construction;
- mechanical and electrical properties.

This International Standard is to be used in conjunction with IEC 61084-1:2017.

The text of this standard is based on the following documents:

FDIS	Report on voting
23A/827/FDIS	23A/834/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

This part of the IEC 61084 series supplements or modifies the corresponding clauses of IEC 61084-1:2017 as follows:

- where no particular clause or subclause of IEC 61084-1 is mentioned, the corresponding clause or subclause of IEC 61084-1 applies as far as is reasonable;
- where “addition” or “replacement” is stated, the relevant text of IEC 61084-1 is to be adapted accordingly;
- subclauses, figures and tables which are additional to those in IEC 61084-1 are numbered starting from 101.

A list of all parts in the IEC 61084 series, published under the general title *Cable trunking and cable ducting systems for electrical installations*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed, [IEC 61084-2-1:2017](#)
- withdrawn, <https://standards.iteh.ai/catalog/standards/sist/f829508f-b032-43ad-a666-cabe5f8c8d66/iec-61084-2-1-2017>
- replaced by a revised edition, or
- amended.

CABLE TRUNKING SYSTEMS AND CABLE DUCTING SYSTEMS FOR ELECTRICAL INSTALLATIONS –

Part 2-1: Particular requirements – Cable trunking systems and cable ducting systems intended for mounting on walls and ceilings

1 Scope

This part of the IEC 61084 series 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 AC and 1 500 V DC.

These systems are intended for mounting on walls and/or ceilings. They can be embedded, installed in a flush or semi-flush state, surface mounted or mounted away from the surface using fixing devices.

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

2 Normative references (standards.iteh.ai)

This clause of Part 1 is applicable, except as follows:¹⁷

<https://standards.iteh.ai/catalog/standards/sist/f829508f-b032-43ad-a666-cabe5f8c8d66/iec-61084-2-1-2017>

Addition:

IEC 60068-2-75:2014, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60228:2004, *Conductors of insulated cables*

IEC 61084-1:2017, *Cable trunking systems and cable ducting systems for electrical installations – Part 1: General requirements*

ISO 535:2014, *Paper and board – Determination of water absorptiveness – Cobb method*

ISO 536:2012, *Paper and board – Determination of grammage*

3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

3.1 Replace Note 1 to entry by:

Note 1 to entry: Different types of CTS are shown in Figure 101 and explained in Annexe A.

3.2 Replace Note 1 to entry by:

Note 1 to entry: Different types of CDS are shown in Figure 101 and explained in Annex A.

Addition:

3.101
type 2 CTS/CDS
distribution CTS/CDS

CTS/CDS which provides at least the following functions:

- in line junction between two trunking lengths or ducting lengths,
- internal and external changes of direction between two trunking lengths or ducting lengths,
- flat change of direction between two trunking lengths or ducting lengths with the exception of certain systems where such a function is not required e.g. skirting CTS/CDS,
- "T" function between three trunking lengths or ducting lengths with the exception of certain systems where such a function is not required e.g. bench CTS,
- termination of a trunking length or a ducting length

3.102
type 3 CTS/CDS
installation CTS/CDS

distribution CTS/CDS which provides in addition apparatus mounting function

3.103
type 1 CTS/CDS

CTS/CDS that cannot be defined as a type 2 CTS/CDS or as a type 3 CTS/CDS

3.104
surface mounting CTS/CDS (standards.iteh.ai)

CTS/CDS intended for mounting on a surface

[IEC 61084-2-1:2017](#)

3.105
flush-mounting CTS/CDS

<https://standards.iteh.ai/catalog/standards/sist/f829508f-b032-43ad-a666-cabe5f8c8d66/iec-61084-2-1-2017>

CTS/CDS intended for mounting flush with the surface so that at least 90 % of the product depth is recessed below the finished surface when installed according to manufacturer's instructions

3.106
semi-flush mounting CTS/CDS

CTS/CDS intended to fit within a mounting surface so that more than 10 % of the product depth projects from the finished surface

4 General requirements

This clause of Part 1 is applicable.

5 General conditions for tests

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable, except as follows:

Additional subclauses:

6.101 According to the intended installation positions

NOTE More than one classification can be declared.

6.101.1 CDS embedded in the wall or ceiling

6.101.2 CTS/CDS flush in the wall or ceiling

6.101.2.1 CTS/CDS flush in the wall

6.101.2.2 CTS/CDS flush in the ceiling

6.101.3 CTS/CDS semi-flush or surface-mounted on the wall or ceiling

6.101.3.1 CTS/CDS semi-flush or surface-mounted on the wall

6.101.3.2 CTS/CDS semi-flush or surface-mounted on the ceiling

6.101.3.3 CTS/CDS wall fixed and supported by the floor

6.101.3.4 CTS/CDS wall fixed and supported by a horizontal surface other than the floor

6.101.4 CTS/CDS mounted away from the wall or ceiling using fixing devices

6.102 According to the prevention of contact between liquids and insulated conductors and live parts in case of CTS/CDS mounted in a skirting position and wet-treatment of floor

6.102.1 Not declared

6.102.2 Relying completely on manufacturer's instructions restricting the installation position of the CTS/CDS

6.102.3 Relying on manufacturer's instructions allowing all installation positions of the CTS/CDS but restricting the position of insulated conductors and live parts in CTS/CDS

6.102.4 Relying on manufacturer's instructions allowing all installation positions of the CTS/CDS and all positions of insulated conductors and live parts in CTS/CDS

NOTE Installation position refers to the distance between CTS/CDS and the floor.

6.103 According to the type

6.103.1 Type 1 CTS/CDS

6.103.2 Type 2 CTS/CDS (distribution CTS/CDS)

6.103.3 Type 3 CTS/CDS (installation CTS/CDS)

6.104 According to resistance to compression for CDS

6.104.1 CDS for compression 125 N

6.104.2 CDS for compression 320 N

6.104.3 CDS for compression 750 N

6.104.4 CDS for compression 1 250 N

6.104.5 CDS for compression 4 000 N

7 Marking and documentation

This clause of Part 1 is applicable, except as follows:

7.3 Replacement:

7.3 The manufacturer shall provide in his documentation all information necessary for the proper and safe installation and use. It shall include:

- components of the system;
- function of the system components and their assemblies;
- classification of the system in accordance with Clause 6;
- for type 1 CTS/CDS the list of functions;
- linear impedance, in Ω/m , of trunking length or ducting length of system declared according to 6.5.1;
- rated voltage of CTS/CDS declared according to 6.6.2;
- usable cross sectional area, in mm^2 , for cables of the CTS/CDS;

NOTE Certain system components when mounted can reduce the usable cross sectional area for cables.

- instructions to reach the declared classification and functions of the system. These instructions shall include the recommended installation positioning for the CTS/CDS to ensure that the declared IP classification is maintained after installation.

Compliance is checked by inspection.

8 Dimensions

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<https://standards.iteh.ai/catalog/standards/sist/f829508f-b032-43ad-a666-cabe58c8d66/iec-61084-2-1-2017>

This clause of Part 1 is applicable, except as follows:

Addition:

There are no dimension requirements.

9 Construction

This clause of Part 1 is applicable, except as follows:

Additional subclauses:

9.101 Assembling

System components shall fit correctly.

Compliance is checked by inspection.

9.102 Contact between liquids and insulated conductors and live parts

CTS/CDS declared according to 6.102.2, 6.102.3 or 6.102.4 shall prevent liquids coming into contact with insulated conductors and live parts during wet-treatment of floor.

Compliance is checked by inspection and measurement when the area intended to accommodate insulated conductors is at least 10 mm above the floor due to the following reasons:

- design, or
- manufacturer's instructions restricting the installation position of the CTS/CDS, or
- manufacturer's instructions allowing all installation positions of the CTS/CDS but restricting the position of insulated conductors and live parts in CTS/CDS.

In all other cases, compliance is checked by the following test carried out on an assembly or assemblies.

An assembly is made of one or more trunking lengths or ducting lengths with the relevant system component, if any, to fulfil the various functions of the system and prepared according to the manufacturer's instructions. More than one assembly may be necessary to fulfil the various functions of the system. In each direction, the length L of trunking length or ducting length coming out of the functional area associated with the function of the system is as long as the width W of the trunking length or ducting length, or 250 mm, whichever is the greater. The tolerance of L is ± 25 mm.

NOTE 1 Functional area refers, for example, to a fitting, an apparatus mounting device, a junction as shown in Figure 106.

The assembly is fixed according to manufacturer's instructions to an appropriate support. The ends of the assembly are closed according to manufacturer's instructions.

A (5 ± 1) mm wide strip of absorbent paper is placed on the lowest internal surface of CTS/CDS intended for the accommodation of insulated conductors. If this lowest internal surface is horizontal, the strip is placed approximately on the centre line of the surface. The absorbent paper has a water absorptive height longitudinal of 75 mm per 10 min according to ISO 535 and a basis weight of 250 g/m² according to ISO 536. The length of the strip is such that it covers the whole length of the assembly.

NOTE 2 When the tested function of the system includes a change of direction, the length of paper can be made of more than one strip.

Provisions are made such that the absorbent paper makes contact with the lowest internal surface of CTS/CDS intended for the accommodation of insulated conductors along the whole length of the assembly. These provisions shall not influence absorption by the paper.

The assembly is carefully placed in a tray containing water to simulate a $(10, 0/-1)$ mm height of water on the floor.

NOTE 3 For easy measurement of wet area, coloured water can be used.

After (15 ± 1) s, the assembly is removed from the tray and the exterior of the assembly is immediately wiped.

After careful removal of the access covers, if any, the absorbent paper is removed. Within 5 min after the removal of the assembly from the tray, the lengths of the wet areas are measured on the centre line of the strips.

For each tested function, the length of any wet area in the strip of absorbent paper shall be shorter than 50 mm.

10 Mechanical properties

This clause of Part 1 is applicable, except as follows:

10.2 Cable support test

Replacement:

10.2 Cable support test

10.2.1 General test conditions

Each test is made on one new sample of trunking length or ducting length having a length of 250 mm \pm 5 mm.

Trunking length or ducting length having a usable cross sectional area lower than or equal to 500 mm² do not need to be tested.

The sample is securely fixed, using 10 mm external diameter flat metallic washers and metallic screws to a rigid smooth support such as a plywood board 16 mm thick. When 10 mm external diameter is too large, a suitable smaller washer is used. Fixing(s) are positioned at (200 \pm 5) mm centres along the length of the sample.

Within the width of the sample, the fixing is made as close as possible to each side wall. For triangular or similar cross section CTS/CDS, the sample is fixed only to the wall.

If the manufacturer's instructions require the use of cable retainers, the test is carried out using the cable retainers and if possible symmetrically fixed along the length.

The sample is subjected to an evenly distributed load of 1,0 g/mm² of the declared usable area for cables, per metre length. The load is distributed between the compartments proportionally to the declared usable area. The load consists of copper insulated conductors or cables complying with class 5, Table 3 of IEC 60228:2004 or flexible insulated conductors or cables of similar mass per meter.

To allow for settlement of the sample, a pre-load of 10 % of the load is applied and removed after 5 min \pm 30 s. The measurement apparatus is then calibrated to zero. No pre-load is necessary for CTS/CDS classified in accordance with 6.101.3.3.

Non-metallic and composite trunking lengths or non-metallic and composite ducting lengths are tested at the maximum application temperature declared by the manufacturer according to Table 3 of Part 1 with a tolerance of \pm 2 °C.

Insulated conductors or cables of 25 mm² nominal cross section are placed in the sample so that approximately 50 % of the load is achieved. If the dimensions of the compartment do not permit the accommodation of 25 mm² insulated conductor or cable, 2,5 mm² nominal cross section insulated conductors or cables are used. Insulated conductors or cables of 2,5 mm² nominal cross section are placed on top of the larger cables to achieve the total load within a tolerance of \pm 5 g.

The load is applied for 120 min (+5/0) min. After this period, the deflection is measured at approximately the middle of the length.

10.2.2 Test for wall fixed CTS/CDS

This test applies to CTS/CDS declared according to 6.101.3.1 and/or 6.101.3.3.

The trunking length or ducting length is mounted as shown in Figure 102, following 10.2.1.

The vertical deflection F is measured as follows:

- *for rectangular or similar cross section CTS/CDS, on the lower edge as shown in Figure 102a;*
- *for non-rectangular cross section CTS/CDS, as shown in Figure 102b.*

The vertical deflection F shall not exceed 10 % of the external horizontal dimension X , with a maximum of 10 mm. This deflection criteria does not apply to CTS/CDS classified according to 6.101.3.3.

Access covers of CTS, non-removable cable separators, cable retainers and the like shall remain adequately fixed so as to fulfil their intended function.

10.2.3 Additional test for wall fixed CTS/CDS with removable separator

This test applies to CTS/CDS provided with removable separator and declared according to 6.101.3.1 and/or 6.101.3.3.

The trunking length or ducting length is mounted as shown in Figure 103, with one separator inserted in the most unfavourable position, following 10.2.1.

NOTE The most unfavourable position of the separator is generally the lowest intended position.

Access covers of CTS, removable cable separators, cable retainers and the like shall remain adequately fixed so as to fulfil their intended function.

10.2.4 Test for ceiling fixed CTS/CDS

This test applies to CTS/CDS declared according to 6.101.3.2 and/or 6.101.2.2.

The trunking length or ducting length is mounted as shown in Figure 104, following 10.2.1.

The vertical deflection F is measured as follows:

- *for rectangular or similar cross section CTS/CDS, on the lower surface as shown in Figure 104a,*
- *for non-rectangular cross section CTS/CDS, as shown in Figure 104b.*

The vertical deflection F shall not exceed 10 % of the external horizontal dimension X , with a maximum of 10 mm.

Access covers of CTS, non-removable cable separators, cable retainers and the like shall remain adequately fixed so as to fulfil their intended function.

10.2.5 Additional test for ceiling fixed CTS/CDS with removable separator

This test applies to CTS/CDS provided with removable separator and declared according to 6.101.3.2 and/or 6.101.2.2.

The trunking length or ducting length is mounted as shown in Figure 105, with one separator inserted in the most unfavourable position, following 10.2.1.

NOTE The most unfavourable position of the separator is generally in the middle of the width.

Access covers of CTS, removable cable separators, cable retainers and the like shall remain adequately fixed so as to fulfil their intended function.

10.3 Impact test

10.3.2 Impact test for installation and application

Additional subclauses:

10.3.2.101 The test is carried out on an assembly made of one or more trunking lengths or ducting lengths with the relevant system component, if any, to fulfil the various functions of the system and prepared according to the manufacturer's instructions. More than one assembly may be necessary to fulfil the various functions of the system. In each direction, the length L of trunking length or ducting length coming out of the functional area associated with the function of the system is as long as the width W of the trunking length or ducting length, or 250 mm, whichever is the greater. The tolerance of L is ± 25 mm.

NOTE Functional area refers, for example, to a fitting, an apparatus mounting device, a junction as shown in Figure 106.

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The samples are mounted on a rigid smooth support such as a plywood board 16 mm thick, with a 50 mm minimum spacing between the assembly and the edge of the support.

Other system components can be included to prevent movements. These system components are the system components to terminate the trunking length or ducting length, if any. When there is no such system component, a system component chosen by the manufacturer is used.

Examples for arrangement are shown in Figure 107.

Before the test non-metallic system components and composite components are aged at the temperature declared according to Table 3 of Part 1 with a tolerance of ± 2 °C for (168 ± 4) h continuously.

10.3.2.102 The impact test apparatus according to Clause 4 of IEC 60068-2-75:2014 is mounted on a solid wall or structure providing sufficient support.

The samples are placed in a cabinet at the temperature declared according to Table 2 with a tolerance of ± 2 °C.

10.3.2.103 After 2 h, each sample is, in turn, removed from the cabinet and immediately placed in position in the impact test apparatus.

At (12 ± 2) s after the removal of the sample from the cabinet, the hammer is allowed to fall so that an impact is applied as far as possible perpendicular to the accessible region of the sample likely to be the weakest. Compliance with impact applied before 10 s provides also compliance with this test of the standard.

NOTE 1 The region likely to be the weakest can be on the relevant system component but can also be on a trunking length or a ducting length.

No impact is applied to knockouts, membranes and the like.

No impact is applied within 50 mm of any open extremity of the sample.

NOTE 2 When another system component has been included at an extremity of the sample to prevent movements, this extremity is still considered open.

Instead of placing the samples in a cabinet and applying the impact at (12 ± 2) s after the removal of the sample from the cabinet, it is allowed to apply the impact in a climatic chamber at the temperature declared according to Table 2 with a tolerance of ± 2 °C on samples placed at this temperature at least for 2 h. Compliance in the climatic chamber is sufficient. In case of failure in the climatic chamber, compliance using the cabinet provides compliance with the standard.

10.3.2.104 After the test

- *the assemblies shall show no cracks or similar damage visible to normal or corrected vision without magnification and*
- *the assemblies shall remain intact*

such that safety is not impaired.

[IEC 61084-2-1:2017](http://standards.iteh.ai/)

In case of doubt, the test of 14.1.3 of Part 1 is carried out on the impacted samples to check that the declared degree of protection against access to hazardous parts is maintained. The declared degree of protection against access to hazardous parts is either the additional letter directly declared by the manufacturer according 6.7.3 of Part 1, if any, or the degree of protection against access to hazardous parts indirectly declared by the manufacturer according 6.7.1 of Part 1.

NOTE Any cracks in internal dividers which are not likely to impair electrical safety or use are ignored. Electrical safety can be impaired when the impact creates a sharp edge on a partition which can damage insulated conductors or cables (see 9.1).

10.4 Linear deflection test

Replacement:

This test is only applicable to CTS/CDS declared according to 6.101.4.

Compliance is checked by the following test.

The test is carried out on a test sample made of one trunking length or ducting length or two jointed trunking lengths or ducting lengths complying with the following conditions:

- *the length of the assembly is the maximum distance between supports (D) according to the manufacturer's instructions increased by $200 \text{ mm} + 100 \text{ mm} / 0$,*
- *unless otherwise specified in the manufacturer's instructions, the joint is positioned at mid span.*