

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Conduit systems for cable management –  
Part 25: Particular requirements – Conduit fixing devices**

**Systèmes de conduits pour la gestion du câblage –  
Partie 25: Exigences particulières – Dispositifs de fixation de conduit**

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**CONDUIT SYSTEMS FOR CABLE MANAGEMENT –****Part 25: Particular requirements –  
Conduit fixing devices**

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International Standard IEC 61386-25 has been prepared by subcommittee 23A: Cable management systems, of IEC technical committee 23: Electrical accessories.

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

FDIS	Report on voting
23A/635/FDIS	23A/637/RVD

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

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

This standard is to be read in conjunction with IEC 61386-1:2008, *Conduit systems for cable management – Part 1: General requirements*.

The clauses of the particular requirements of this Part 25 add to or modify the corresponding clauses in Part 1. Where the text of Part 25 indicates an "addition" to or a "deletion" or a "replacement" of the relevant requirement, test specification or explanation of Part 1, these changes are made to the relevant text of Part 1, which then becomes part of the standard. Where no change is necessary, the words "This clause of Part 1 is applicable" are used in Part 25. Subclauses or figures that are additional to those in Part 1 are numbered starting from 101.

NOTE The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

A list of all the parts in the IEC 61386 series, under the general title *Conduit systems for cable management*, can be found on the IEC website.

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## CONDUIT SYSTEMS FOR CABLE MANAGEMENT –

### Part 25: Particular requirements – Conduit fixing devices

#### 1 Scope

This clause of Part 1 is applicable except as follows:

*Replacement in the first paragraph of the words “conduit fittings” by “conduit fittings and conduit fixing devices”.*

*Addition at the end of the clause:*

This part of IEC 61386 specifies requirements and tests for conduit fixing devices used for support and/or retention of conduit for cable management.

#### 2 Normative references

This clause of Part 1 is applicable with the following exception:

*Addition:*

ISO 4287, *Geometrical Product Specifications (GPS) – Surface texture: Profile method – Terms, definitions and surface texture parameters*

#### 3 Terms and definitions

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

*Addition:*

##### 3.101 conduit fixing device

device designed to provide retention of conduit(s) when installed at intervals along the length of the conduit. A conduit fixing device is designed so that it can be securely fixed to a mounting surface.

##### 3.102 metallic conduit fixing device

fixing device consisting of metal only

##### 3.103 non-metallic conduit fixing device

fixing device consisting of non-metallic material only

##### 3.104 composite conduit fixing device

fixing device comprising both metal and non-metallic materials

### 3.105

#### retention

limitation of the lateral and/or axial movement of the conduit

## 4 General requirements

This clause of Part 1 is applicable except as follows:

*Replacement:*

**4.1** Conduit fixing devices shall be so designed and constructed that in normal use their performance is reliable.

**4.2** Conduit fixing devices shall withstand the stresses likely to occur during transport, storage, recommended installation practice and application.

**4.3** *Compliance is checked by carrying out all specified tests.*

## 5 General conditions for tests

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

**5.1** *Replacement:*

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Tests in accordance with this standard are type tests. Conduit fixing devices, having the same classification, which vary in colour only, are considered to be the same product type and only one colour needs to be tested.

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Conduit fixing devices are tested as part of a conduit system.

Where a conduit fixing device accommodates a range of conduit sizes, the conduit fixing device shall be tested using the smallest and the largest conduit size.

**5.4** *Replacement:*

Samples of non-metallic and composite conduit fixing devices shall be conditioned for at least 240 h, at a temperature of  $(23 \pm 2)$  °C and a relative humidity between 40 % and 60 %. All tests shall be carried out immediately after general conditioning.

**5.5** *Replacement:*

Unless otherwise specified, the samples for each test shall be in a clean and new condition. Due regard shall be taken of the manufacturer's instructions, especially where force is required in the assembly of the joint.

**5.6 and 5.9** *Not applicable.*

## 6 Classification

This clause of Part 1 is applicable except as follows:

**6.1.1, 6.1.3, 6.1.4 and 6.1.5** *Not applicable.*

*Addition:*



**6.1.101 Resistance to lateral load**

- 1 Light
- 2 Medium
- 3 Heavy

**6.1.102 Resistance to axial load**

- 1 None declared
- 2 As declared by the manufacturer

**6.2.2 Upper temperature range**

*Replacement of Table 2:*

**Table 2 – Upper temperature range**

Classification	Application and installation – Temperature not more than: °C
0	40
1	60
2	90
3	105
4	120
5	150
6	250

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**6.3, 6.4.1 and 6.4.2** *Not applicable.*

**7 Marking and documentation**

This clause of Part 1 is applicable except as follows:

*Replacement:*

**7.1** Each conduit fixing device shall be marked with

- the manufacturer's or responsible vendor's name or trade mark or identification mark,
- a product identification mark, which may be, for example, a catalogue number, a symbol or the like, in such a way that it can be identified in the manufacturer's or responsible vendor's literature.

**7.1.1** The manufacturer shall be responsible for indicating the compatibility of conduit fixing devices within conduit systems according to the IEC 61386 series.

**7.1.2** The manufacturer shall provide in his literature its classification in accordance with Clause 6 and all information necessary for the proper and safe transport, storage, installation and use.

## 7.2 Replacement:

The conduit fixing device shall be marked in accordance with 7.1, on the product wherever possible, but where this is impractical, then the mark may be on a label attached to the product, or on the smallest supplied package.

7.3 and 7.4 *Not applicable.*

## 8 Dimensions

This clause of Part 1 is replaced by the following text:

Conduit fixing devices shall be capable of accommodating the size or range of conduit diameters as declared by the manufacturer or responsible vendor.

## 9 Construction

This clause of Part 1 is applicable except as follows:

*Replacement:*

9.1 Within the conduit fixing device there shall be no sharp edges, burrs or surface projections which are likely to damage the conduit system, or inflict injury on the installer or user.

*Compliance is checked by inspection, if necessary after cutting the samples apart.*

9.2 Fixing means shall be designed to withstand the mechanical stresses occurring during installation and normal use.

Screws, if any, used for assembly of the conduit fixing device, shall not cause damage to the conduit system components when correctly assembled.

*Compliance for screw fixing using preformed threads is checked by the test in 9.3, followed by inspection.*

*Compliance for screw fixing using thread-forming screws is checked by the test in 9.4, followed by inspection.*

*Compliance for reusable fixings other than screws is checked by assembly and removal ten times according to the manufacturer's instruction.*

*Compliance for non-reusable fixings is checked by assembly to the manufacturer's instruction.*

9.5 and 9.6 *Not applicable.*

## 10 Mechanical properties

This clause of Part 1 is applicable except as follows:

*Replacement:*

10.1.1 Conduit fixing devices shall have adequate mechanical strength.

**10.1.2** *Compliance is checked by the tests specified in 10.3, 10.101 and 10.102.*

**10.2** **Compression test** *Not applicable.*

**10.3.1** *Replacement:*

*Twelve assemblies of a conduit fixing device and a steel mandrel or conduit are subjected to the impact test by means of the apparatus shown in Figure 2.*

*Conduit fixing devices which can be used with any type of conduit, with outside diameters according to IEC 60423, shall be tested using a steel mandrel with an outside diameter according to the minimum diameter of the relevant size.*

*The manufacturing tolerance of the mandrel shall be  $(\begin{smallmatrix} 0 \\ -0,02 \end{smallmatrix})$  mm up to and including 20 mm and  $(\begin{smallmatrix} 0 \\ -0,03 \end{smallmatrix})$  mm above nominal size 20 mm.*

*Conduit fixing devices which can only be used with a specific conduit shall be tested using that conduit.*

*The test assembly is fixed on a vertical surface as shown in Figure 101 or Figure 102 but with only one fixing device.*

*Conduit fixing devices, whose maximum dimension is less than 20 mm, are not subjected to this test.*

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**10.3.2** *Replacement of the last paragraph:*

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*The test shall be made on the weakest part of the conduit fixing device.*

**10.3.3** *Replacement:*

*After the test, the mandrel or conduit shall remain inside the conduit fixing device and there shall be no sign of disintegration nor shall there be any crack visible to normal or corrected vision without magnification.*

*At least nine of the twelve samples shall pass the test.*

**10.4** **Bending test** *Not applicable.*

**10.5** **Flexing test** *Not applicable.*

**10.6** **Collapse test** *Not applicable.*

**10.7** **Tensile test** *Not applicable.*

**10.8** **Suspended load test** *Not applicable.*

*Addition:*

**10.101** **Lateral load test**

**10.101.1** *Two conduit fixing devices are mounted with a mandrel as shown in Figure 101 or with an appropriate length of conduit as shown in Figure 102.*

*Conduit fixing devices which can be used with any type of conduit, with outside diameters according to IEC 60423, shall be tested using a steel mandrel with an outside diameter*

according to the minimum diameter of the relevant size, applying a load, including the weight of the steel mandrel, according to the classification in 6.1.101, and Table 101.

The steel mandrel shall have a surface roughness of 7  $\mu\text{m}$  Ra in accordance with ISO 4287. The manufacturing tolerance of the mandrel shall be  $(\begin{smallmatrix} 0 \\ -0,02 \end{smallmatrix})\text{mm}$  up to and including 20 mm and  $(\begin{smallmatrix} 0 \\ -0,03 \end{smallmatrix})\text{mm}$  above nominal size 20 mm.

Conduit fixing devices which can only be used with a specific conduit shall be tested using that conduit and the manufacturer shall declare the performance of the combination of conduit and fixing device. For the purpose of applying the load, a steel rod with an outside diameter of 30 % to 50 % of the inside diameter of the conduit is inserted through the conduit and a load including the weight of the steel rod, according to the classification in 6.1.101, and Table 101, is applied across the two ends of the steel rod.

The test is carried out on 3 pairs of conduit fixing devices wall mounted and another 3 pairs of conduit fixing devices ceiling mounted.

**10.101.2** For metallic fixing devices, the test load, as declared by the manufacturer or responsible vendor, is applied, without shock, for a period of  $(300\begin{smallmatrix} +10 \\ 0 \end{smallmatrix})\text{ s}$  at ambient temperature.

**10.101.3** For non-metallic and composite fixing devices, the sample assembly is then placed in a full draft air circulating oven. The tests are carried out after the oven temperature has reached and maintained the declared maximum temperature according to Table 2 with a tolerance of  $(\begin{smallmatrix} +2 \\ -2 \end{smallmatrix})\text{ }^\circ\text{C}$ . The load is applied, without shock, and held for a period of  $(60\begin{smallmatrix} +5 \\ 0 \end{smallmatrix})\text{ min}$ .

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**Table 101 – Lateral load for test**

Conduit size up to mm	Light lateral load (classification code 2) kg	Medium lateral load (classification code 3) kg	Heavy lateral load (classification code 4) kg
6	0,1	0,2	0,4
8	0,2	0,4	0,8
10	0,3	0,6	1,2
12	0,5	1	2
16	0,8	1,6	3,2
20	1	2	4
25	2	4	8
32	3,3	6,6	13,2
40	5,1	10,2	20,4
50	8,0	16	32
63	12,7	25,4	50,8
75	18	36	72
90	25,9	51,8	103,6
110	38,7	77,4	154,8
NOTE 1 Load tolerance up to but not including 1 kg: + 5 %			
NOTE 2 Load tolerance 1 kg to 10 kg: + 2 %			
NOTE 3 Load tolerance above 10 kg: + 1 %			