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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Articulated systems and flexible systems for cable guiding

Systèmes articulés et souples pour guidage de câbles

IEC 62549:2011

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ARTICULATED SYSTEMS AND FLEXIBLE SYSTEMS FOR CABLE GUIDING

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by subcommittee 23A: Cable management systems, of IEC technical committee 23: Electrical accessories.

The text of this interpretation sheet is based on the following documents:

ISH	Report on voting
23A/769/ISH	23A/783/RVD

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

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Interpretation of Subclause 10.2 of IEC 62549 Ed.1.

10.2 Impact test

10.2.3 The impact to be applied is the one declared according to the classification in Subclause 6.2.

Interpretation of Clause 13 of IEC 62549 Ed.1.

13 External influences

13.1.2 The classification to be checked is the one declared according to Subclause 6.5.1.

13.1.3 The classification to be checked is the one declared according to Subclause 6.5.2.

13.1.4 The classification to be checked is the one declared according to Subclause 6.5.3.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ARTICULATED SYSTEMS AND FLEXIBLE SYSTEMS FOR CABLE GUIDING

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This International Standard IEC 62549 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:

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23A/636/FDIS	23A/641/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.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The contents of the interpretation sheet 1 of October 2015 have been included in this copy.

ARTICULATED SYSTEMS AND FLEXIBLE SYSTEMS FOR CABLE GUIDING

1 Scope

This International Standard specifies requirements and tests for systems with adaptable linear geometry for cable guiding intended for the accommodation and retention of 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 cable trunking systems, cable ducting systems, conduit systems, cable tray systems, cable ladder systems, powertrack systems, energy conveying chains or equipment covered by other standards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-75:1997, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60417, *Graphical symbols for use on equipment*

IEC 60423:2007, *Conduit systems for cable management – Outside diameters of conduits for electrical installations and threads for conduits and fittings*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
Amendment 1 (1999)[1]

IEC 60670-1:2002, *Boxes and enclosures for electrical accessories for household and similar fixed electrical installations – Part 1: General requirements*

IEC 60670-22:2003, *Boxes and enclosures for electrical accessories for household and similar fixed electrical installations – Part 22: Particular requirements for connecting boxes and enclosures*

IEC 60670-23:2006, *Boxes and enclosures for electrical accessories for household and similar fixed electrical installations – Part 23: Particular requirements for floor boxes and enclosures*

IEC 60670-24:2011, *Boxes and enclosures for electrical accessories for household and similar fixed electrical installations – Part 24: Particular requirements for enclosures for housing protective devices and other power dissipating electrical equipment*

IEC 60695-2-11:2000, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products*
Corrigendum (2001)

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[1] There exists a consolidation version of IEC 60529 (2001), which contains IEC 60529 (1989) and its amendment 1 (1999).

IEC 60695-11-5:2004, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method - Apparatus, confirmatory test arrangement and guidance*

IEC 62262:2002, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*

3 Terms and definitions

For the purpose of this document, the following definitions apply.

3.1
articulated system for cable guiding
assembly comprising an articulated length for cable guiding and possibly other system components to provide accommodation of cables and possibly the accommodation of other electrical equipment

NOTE 1 An example of an articulated system for cable guiding is shown in Figure 1.

NOTE 2 Examples of application are shown in Figure 3.

3.2
flexible system for cable guiding
assembly comprising a flexible length for cable guiding and possibly other system components to provide accommodation of cables and possibly the accommodation of other electrical equipment

NOTE 1 Examples of flexible system for cable guiding are shown in Figure 2.

NOTE 2 Examples of application are shown in Figure 3.

3.3
system component
part of the system which includes

a) articulated length for cable guiding or flexible length for cable guiding,

b) box,

c) apparatus mounting device,

d) fixing 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
articulated length for cable guiding
system component of an articulated system for cable guiding consisting of several elements which are connected by articulated joint(s)

3.5
flexible length for cable guiding
system component of a flexible system for cable guiding with adaptable linear geometry other than articulated length

3.6
enclosure
combination of parts, such as boxes, covers, cover-plates, lids, box extensions, accessories, etc. providing, after assembly and installation as in normal use, an appropriate protection against external influences and a defined protection against contact with enclosed live parts from any accessible direction

[Definition 3.1 in IEC 60670-1:2002]

3.7
box
part of an enclosure provided with means for fixing a cover, cover-plate, accessory, etc. and intended to receive accessories (such as socket-outlets, switches, etc.)

[Definition 3.2 in IEC 60670-1:2002]

3.8
apparatus mounting device
system component to accommodate electrical apparatus (switches, socket-outlets, circuit breakers, telephone outlets, etc.)

NOTE An apparatus mounting device can be a separate system component, a part integral with a box, a part integral with an electrical apparatus, etc.

3.9
fixing device
system component to secure another system component to a surface

3.10
system accessory
system component which provides a supplementary function

NOTE Examples of system accessories are derivation, protection against traffic loads, etc.

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

3.12
non-metallic system component
system component which consists of non-metallic material only

3.13
composite system component
system component comprising both metallic and non-metallic materials

3.14
external influence
factor which may affect the system

3.15
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

NOTE This concept does not necessarily imply a risk of electric shock

[IEC 60050-826:2004, definition 12-08]

3.16
cable anchorage
system accessory or part of another system component to relieve conductors in terminals and terminations from strain by resisting the pull and twist forces on cable

3.17
cable retainer
system accessory or part of the articulated length for cable guiding or part of the flexible length for cable guiding to retain cables

3.18
(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

[IEC 60050-195:2004, definition 195-06-19]

4 General requirements

Articulated systems for cable guiding and flexible systems for cable guiding shall be so designed and constructed that they provide reliable accommodation and retention to the cables contained therein.

If required, the system shall also provide electrically protective separation.

System components shall withstand the stresses likely to occur during recommended installation practice and usage.

Boxes, if any, shall provide adequate enclosure to electrical apparatus (switches, socket-outlets, circuit breakers, telephone outlets, etc.) and shall comply with the relevant parts of the IEC 60670 series.

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 articulated systems for cable guiding or the flexible systems for cable guiding.

Compliance is checked by carrying out all the tests specified.

5 General conditions for tests

5.1 Unless otherwise specified, 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 with the articulated system for cable guiding or the flexible system for cable guiding assembled and installed as in normal use according to the manufacturer's instructions.

For the following tests of the IEC 60670 series, boxes are tested with the relevant system components and the cables:

– Clause10 Protection against electric shock
– Subclause 13.2 Protection against the ingress of solid objects
– Subclause 13.3 Protection against harmful ingress of water

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 when specified in this standard.

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

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

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

5.7 Unless otherwise specified, three samples are subjected to the tests and the requirements are satisfied if all the tests are successful.

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 test house 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 temperatures as given in Table 1 and Table 2

Table 1 – Minimum application temperature

Minimum application temperature °C
- 25 - 15 - 5 + 5 + 15

Table 2 – Maximum application temperature

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

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

6.2 According to resistance to impact

6.2.1 System providing impact resistance up to 0,5 J

6.2.2 System providing impact resistance up to 1 J

6.2.3 System providing impact resistance up to 2 J

6.2.4 System providing impact resistance up to 5 J

6.2.5 System providing impact resistance up to 10 J

6.2.6 System providing impact resistance up to 20 J

6.3 According to the installation onfloor

6.3.1 System not intended to be installed onfloor

6.3.2 System intended to be installed onfloor

6.4 According to electrical continuity characteristic

6.4.1 System with electrical continuity characteristic

6.4.2 System without electrical continuity characteristic

6.5 According to degrees of protection, if any, provided by the system according to IEC 60529:1989

6.5.1 According to protection against ingress of solid foreign objects

6.5.2 According to protection against ingress of water

6.5.3 According to protection against access to hazardous parts

7 Marking and documentation

7.1 Each system component shall be marked with

– the manufacturer's or responsible vendor's name or trade mark or identification mark and,

– a product identification mark, which may be, for example, a catalogue number, a symbol or the like.

When system components other than articulated lengths for cable guiding, flexible lengths for cable guiding or boxes are supplied in a package, and it is not possible to have both markings legible due to the small size of the item

– if only 1 legible marking is possible, it is sufficient to mark the product identification on the smallest supplied package, the manufacturer's or responsible vendor's name or trade mark or identification mark being marked on the product

– if no legible marking is possible at all, it is sufficient to place both markings on the smallest supplied package

Terminals for protective earth shall be marked according to 7.4. This marking shall not be placed on screws or any other easily removable part.

Compliance is checked by inspection using one sample.

7.2 Marking shall be durable and easily legible.

Compliance is checked by inspection and for marking on the product, in addition, by rubbing the marking by hand for at least 15 s with a piece of cotton cloth soaked with water and again for at least 15 s with a piece of cotton cloth soaked with petroleum spirit.

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

NOTE 2 Marking may be applied, for example, by moulding, pressing, engraving, printing, adhesive labels, or water slide transfers.

NOTE 3 Marking made by moulding, pressing or engraving is not subjected to the rubbing test.

After the rubbing test, the marking shall be legible.

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

– a listing of the system components,
– a description of the function of the system components and of their assemblies,
– the classification of the system in accordance with Clause 6 with the following exception
  – classification according to 6.4.2 does not need to be declared,
– the allowed minimum bending radius as shown in Figure 4,
– the smallest and the largest outer diameter of the cables that can be used within the system,
– the usable cross-sectional area, in mm^2, for cables.

Compliance is checked by inspection.

7.4 If symbols are used, they shall comply with the IEC 60417 such as

– Volts V
– Protective earth 
– Degree of protection IPXX (see IEC 60529:1989)

8 Dimensions

There are no dimensional requirements.

9 Construction

9.1 Sharp edges

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

Compliance is checked by inspection using one sample, if necessary after cutting the sample apart.

Screws, studs or other securing devices provided shall be fitted so as not to damage the cables.

Compliance is checked by inspection.

9.2 Minimum bending radius

It shall be possible to easily bend the articulated length for cable guiding or the flexible length for cable guiding with a bending radius as small as that declared by the manufacturer. See Figure 4.