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INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

Electrical accessories – Cable reels for household and similar purposes

Petit appareillage électrique – Cordons prolongateurs enroulés sur tambour pour usages domestiques et analogues

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

This amendment has been prepared by subcommittee 23B: Plugs, socket-outlets and switches, of IEC technical committee 23: Electrical accessories.

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

FDIS	Report on voting
23B/872/FDIS	23B/883/RVD

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the maintenance result 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- withdrawn,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.

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1 Scope

Replace the whole text of this clause by the following:

This International Standard applies to cable reels for a.c. only, with a rated voltage above 50 V and not exceeding 250 V for single-phase cable reels and above 50 V and not exceeding 440 V for all other cable reels, and a rated current not exceeding 16 A. They are intended for household, commercial and light industrial and similar purposes, either indoors or outdoors, with particular reference to safety in normal use.

This standard does not apply to:

– cable reeling devices incorporated in appliances or luminaires;

– cable reeling devices associated with appliances or luminaires.

NOTE 1 Requirements for cable reeling devices incorporated in appliances are specified in IEC 60335-1 and IEC 60335-2-2.

NOTE 2 Requirements for cable reeling devices incorporated in luminaires are specified in IEC 60598-1 and IEC 60598-2-25.

NOTE 3 A cable reeling device associated with an appliance or luminaire is a device designed to supply a specific appliance or luminaire. It must be fixed to or delivered with the appliance or luminaire, without being incorporated in it and having its own enclosure which provides protection against electric shock. An example is a cable reeling device associated with handlamps according to IEC 60598-2-8.

This standard may be used as a guide for cable reeling devices incorporated or associated in appliances or luminaires as far as it is applicable.

Cable reels complying with this standard are suitable for use at ambient temperatures not normally exceeding 25 °C, but occasionally reaching 35 °C.

In locations where special conditions prevail, special construction may be required.

2 Normative references

Replace the text introducing the normative references by the following:

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.

Replace the whole list of references by the following:

IEC 60050-441:1984, *International Electrotechnical Vocabulary – Chapter 441: Switchgear, controlgear and fuses*

IEC 60112:2003, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltage up to and including 450/750 V*

IEC 60245 (all parts), *Rubber insulated cables – Rated voltages up to and including 450/750 V*

IEC 60417, *Graphical symbols for use on equipment*

IEC 60529:1989, *Degrees of protection provided by enclosures* (IP Code)

IEC 60695-2-10:2000, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

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*

IEC 60730-2-9, *Automatic electrical controls for household and similar use – Part 2-9: Particular requirements for temperature sensing controls*

IEC 60884 (all parts), *Plugs and socket-outlets for household and similar purposes*

IEC 60999 (all parts), *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units*

ISO 1456:2003, *Metallic coatings – Electrodeposited coatings of nickel plus chromium and of copper plus nickel plus chromium*

ISO 2081:1986, *Metallic coatings – Electroplated coatings of zinc on iron or steel*

ISO 2093:1986, *Electroplated coatings of tin – Specification and test methods*

3 Definitions

Replace Definition 3.3 by the following new definition:

3.3
cable reel
device constructed and intended so that a non-detachable flexible cable or a detachable flexible cable can be wound onto the reel

NOTE Plugs and socket-outlets supplied with cable reels are considered as part of the reel.

Replace definition 3.4 by the following new definitions:

3.4
flexible cable
cable whose structure and materials make it suitable to be flexed while in service

3.4.1
non-detachable flexible cable
flexible cable which is fixed and wired to a cable reel

3.4.2
detachable flexible cable
flexible cable which is not wired to a cable reel

Add the following new definitions:

3.23
weak point
intentionally weak non-resettable part intended to rupture the current under overload or abnormal conditions to prevent the occurrence of a condition which might impair compliance with this standard, and whose replacement can not be carried out without making the cable reel useless

NOTE Such part may be a component or a part of a component, such as a resistor or a capacitor, or a thermal link incorporated in the cable reel.

3.24
cord extension set
assembly consisting of one flexible cable fitted with one plug and a single or multiple portable socket-outlet

5 General conditions for type testing

Replace the title of this clause by the following:

5 General remarks on tests

5.1 *Add, at the end of 5.1, the following new paragraph:*

Cable reels according to 6.3.2 are tested with the detachable flexible cable(s) as marked on the cable reels (see 7.3.2).

5.2 *Replace the second paragraph of this subclause by the following:*

For the test of 20.1, additional samples may be required in order to determine the highest possible current at which the weak point will not operate.

Unless otherwise specified, the components of the cable reels are tested in accordance with the requirements of the relevant standard, as applicable.

6 Classification

Replace 6.3 by the following:

6.3 the method of connecting the flexible cable:

a) cable reels with a non-detachable flexible cable
   1) rewirable
   2) non-rewirable
b) cable reels with a detachable flexible cable

Replace 6.5 by the following:

6.5 the degree of protection against harmful effects due to the ingress of water

– IPX0: accessories not protected against ingress of water
– IPX4: accessories protected against splashing water
– IPX5: accessories protected against water jets

NOTE For an explanation of IP codes, see IEC 60529.

Replace 6.6 by the following:

6.6 the protection against excessive temperatures:

– incorporating thermal cut-outs and/or current cut-outs;
– incorporating weak points.

7 Marking

7.1 *Delete the second and third paragraphs, including the note.*

Replace 7.3 by the following:

7.3 Cable reels classified according to item 1) of 6.3 a) and 6.3 b) shall be marked as follows:

7.3.1 for cable reels classified according to item 1) of 6.3.a):

– terminals intended exclusively for the neutral conductor shall be marked with the letter N;
– earthing terminals shall be marked with symbol for protective earth (IEC 60417-5019 (2006-08));
– marking indicating the cross-sectional area, the type and the length of the flexible cable shall be placed where it is clearly visible.

These markings shall be so placed that they are easily legible whilst replacing the flexible cable and they shall not be placed on screws, removable washers or on other parts which might easily be removed when connecting conductors.

7.3.2 for cable reels classified according to 6.3b):

– marking indicating the characteristics of the cord extension set (cross-sectional area, the type designation and the length of the flexible cable and the rated current and the type of the plug and the portable socket-outlet) shall be placed where it is clearly visible.

These markings shall be so placed on the reel that they are easily legible in normal use and they shall not be placed on screws, removable washers or on other parts which might easily be removed.

NOTE These markings may include more than one type of cord extension set.

7.4 *Add the following text at the end of the subclause:*

For cable reels incorporating weak point(s), the manufacturer shall inform the user that the further use of the cable reel may be impaired when the maximum load is exceeded.

This information shall be given on the product and on the packaging, if any.

11 Flexible cables and their connection

Add the following paragraphs after the first paragraph of 11.1:

Detachable flexible cable shall be a cord extension set according to the relevant part of IEC 60884 series and comply with the relevant national standard taking into account other requirements of this clause.

At least one of the cord extension set(s) as marked according to 7.3.2 shall be delivered to the end-user with the cable reel.

12 Construction

12.11 *Replace this subclause by the following:*

12.11 Characteristics of thermal cut-outs, current cut-outs and weak points

12.11.1 Thermal cut-outs and current cut-outs:

– shall be trip-free;
– shall be of the non-self-resetting type;
– shall be so constructed that they can be reset without opening covers for terminals;
– shall be so constructed that the setting of temperature or of current cannot be altered by the user;
– shall disconnect:
  a) at least 1 pole in two-pole cable reels, which shall be the phase pole on polarized cable reels;
  b) all poles, except the neutral pole, in other cable reels.

Fuses are only allowed when it is not possible for the user to change them with fuses of a higher rating than originally fitted. The protective conductor, if any, shall not be interrupted.

12.11.2 Weak points:

- shall be of non-self resetting type;
- shall be so constructed that they cannot be replaced;
- shall be so constructed that the setting of temperature or of current cannot be altered by the user;
- shall disconnect:
  a) at least 1 pole in two-pole cable reels, which shall be the phase pole on polarized cable reels;
  b) all poles, except the neutral pole, in other cable reels.

12.12 *Replace the first sentence by the following:*

Cut-outs shall not self-reset even at low temperature.

12.14 *Delete the words* "or synthetic" *in the second sentence.*

Add the following new subclauses:

12.17 Portable cable reels shall be equipped with one plug and at least one socket-outlet.

Fixed cable reels shall be equipped with at least one socket-outlet.

Compliance is checked by inspection.

12.18 The protection against excessive temperature (see 6.6) shall work in any intended and foreseeable use of the cable reel with the cable unreeled, partially reeled or fully reeled.

It shall not be possible to bypass the protection against excessive temperature (see 6.6).

When the detachable flexible cable is detached from the reel and used alone as cord extension set, the protection against excessive temperature is not required.

Compliance is checked by inspection and by the tests of Clauses 19 and 20.

13 Components

Replace the whole of this clause by the following:

13.1 Components incorporated or integrated in cable reels, such as flexible cables, plugs and socket-outlets, current cut-outs, thermal cut-outs, weak points, safety transformers, motors, switches, fuses, residual current operated circuit-breakers, lampholders and connecting devices shall comply with the relevant standards as far as they reasonably apply.

Plugs and socket-outlets shall be in accordance with the national system(s) of the country where the cable reel is intended to be used.

Components shall suit the conditions occurring in the cable reel; for thermal and/or current cut-outs and weak points, 13.2 also applies.

For components according to IEC 60730-2-9, the minimum cycles required is 300.

Compliance is checked by inspection.

13.2 The thermal and/or current cut outs or weak points shall be able to work properly at the ambient temperature reached by the internal micro environment where the cut out or weak point is placed.

The T-marking of the thermal and/or current cut outs or weak points shall be equal or higher than the temperature rise of the internal micro environment + 25 °C.

The temperature rise of the internal micro environment is the average of three different points of measurement of the internal air made during the test of Clause 19.

For thermal cut outs, if the T-marking is equal or higher than the setting temperature the above requirement is considered to be fulfilled.

Compliance is checked by inspection of the components and related data sheets together with the measured temperature in Clause 19.

15 Resistance to harmful ingress of water

Replace the first paragraph by the following:

The enclosure of cable reels shall provide the degree of protection against ingress of water in accordance with the classification of cable reels.

Replace the first paragraph of the testing specification together with the two dashed items by the following:

Compliance is checked by the relevant tests of IEC 60529 according to their IP degree, in their fully unreeled condition:

- *with portable cable reels mounted in the most unfavourable position;*
- *with fixed cable reels mounted as specified by the manufacturer's instructions.*

Socket-outlets are tested without plugs inserted and with their lids, if any, closed.

16 Resistance to humidity

Replace the two dashed texts by:

- *two days (48 h) for cable reels not protected against harmful ingress of water;*
- *seven days (168 h) for cable reels having an IP degree higher than or equal to IPX4.*

19 Temperature rise in normal use

19.2 *Add in Table 6 the following new row after the third one:*

Other material insulation of internal and external wiring and flexible cable	*55 or the value specified in the relative standard, whichever is the lower*

Replace the whole text after Table 6 by the following:

During the test, the thermal and/or current cut-outs, or weak points shall not operate.

After the test, the cable reel shall show no deformation or damage within the meaning of this specification.

During the test, the temperature rises necessary to perform the tests of 13.2 and 22.3 are to be determined.

NOTE Experience has shown that the hottest point of flexible cable insulation is likely to occur between the second and third layers, in the central area, of the cable reel when carefully reeled.

This test is carried out at an ambient temperature of (20 ± 2) °C.

20 Temperature rise under overload conditions

Replace the whole text of this clause by the following:

Cable reels shall be so constructed that there is no risk of fire or electric shock as a result of abnormal electrical load.

Compliance is checked by the tests of 20.1 and 20.2.

These tests are carried out at an ambient temperature of (20 ± 2) °C.

20.1 *Cable reels are tested with cable fully-reeled and unreeled under the conditions described in Clause 19, and are loaded with the highest possible current at which the thermal or current cut-out or the weak point will not operate, until steady conditions are established, or 4 h, whichever is the shorter period.*

NOTE Steady conditions are reached when the temperature does not vary more than 1 K/h.

The temperature rise of the parts of the cable reels, shown in the Table 6 shall not exceed by more than 25 K the relevant values in that table.

After the test, the following conditions shall be fulfilled:

– the cable reel shall show no deformation affecting the protection against electric shock;
– there shall be no short-circuit or damage to the insulation of the cable reel or to the flexible cable, and the further use of the cable reel shall not be impaired.

Compliance is checked by inspection, by a test with the standard test finger shown in Figure 1, applied immediately after the temperature rise test and by the electric strength test specified in 17.2, the test voltage being reduced by 500 V.

The humidity treatment is not repeated before the electric strength test.

– The thermal and/or current cut-out shall not be deformed or damaged, and the preset value shall not have increased.

Compliance is checked by inspection and by a comparison release test on a thermal or current cut-out fitted in a cable reel that has not been subjected to the test of 20.1.

– The preset value of weak point shall not have increased.

Compliance is checked by inspection and by a comparison release test on a weak point fitted in a cable reel that has not been subjected to the test of 20.1.

– The earth connection shall not be impaired.

Compliance is checked by the test specified in 9.7.

20.2 *The cable reel is tested fully reeled under the condition described in Clause 19, the test load being that corresponding to 1,5 times the rated current of the socket-outlets in which the plug of the cable reel may be inserted or 1,5 times the rated current of the protective device in the case of fixed cable reels.*

The load is applied until steady conditions are reached or thermal or current cut-out or weak point has operated.

This test is made on a new sample.

After the test:

a) the cable reel shall show no deformation affecting the protection against electric shock;

Compliance is checked by inspection and by a test with the standard test finger shown in Figure 1. It shall not be possible to touch live parts.

b) the earth connection shall not be impaired.

Compliance is checked by the test specified in 9.7.

21 Mechanical strength

21.2 *Replace the penultimate paragraph by the following:*

Portable cable reels having an IP degree higher than or equal to IPX4 are subjected to the impact test of this subclause at a temperature of –15 °C ± 2 °C.

23 Screws, current-carrying parts and connections

23.5 *Replace this subclause by the following new subclause:*

23.5 Current-carrying parts, including those of terminals (also earthing terminals), shall be of a metal having, under the conditions occurring in the cable reel, mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use.

Compliance is checked by inspection and, if necessary, by chemical analysis.

Examples of suitable metals, when used within the permissible temperature range and under normal conditions of chemical pollution, are as follows:

– *copper;*
– *an alloy containing at least 58 % copper for parts made from cold-rolled sheet or at least 50 % copper for other parts;*
– *stainless steel containing at least 13 % chromium and not more than 0,09 % carbon;*
– *steel provided with an electroplated coating of zinc according to ISO 2081, the coating having a thickness of at least*

  5 μm, service condition ISO no. 1, for accessories classified IP code IPX0;

  12 μm, service condition ISO no. 2, for accessories classified IP code IPX4;

  25 μm, service condition ISO no. 3, for accessories classified IP code IPX5;
– *steel provided with an electroplated coating of nickel and chromium according to ISO 1456, the coating having a thickness of at least*

  20 μm, service condition ISO no. 2, for accessories classified IP code IPX0;

  30 μm, service condition ISO no. 3, for accessories classified IP code IPX4;