BS EN 60320-1:2015+A1:2021
Incorporating corrigenda January 2016 and May 2019

BSI Standards Publication

Appliance couplers for household and similar general purposes

Part 1: General requirements

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Full document details: BS EN 60320-1:2015+A1:2021

National foreword

This British Standard is the UK implementation of EN 60320-1:2015+A1:2021. It is identical to IEC 60320-1:2015, incorporating corrigenda January 2016 and May 2019 and amendment 1:2018. It supersedes BS EN 60320-1:2015, which will be withdrawn on 19 March 2024.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by ▌A1⟩ ⟨A1▌.

The UK participation in its preparation was entrusted to Technical Committee PEL/23/3, Connectors for portable appliances.

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Amendments/corrigenda issued since publication

Date	Text affected
29 February 2016	Implementation of IEC corrigendum January 2016: Subclauses 26.2.2 and 26.3.2 modified
31 July 2019	Implementation of IEC corrigendum May 2019: Subclause 24.1 modified
31 March 2021	Implementation of IEC amendment 1:2018 with CENELEC endorsement A1:2021

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60320-1:2015+A1

March 2021

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English Version

Appliance couplers for household and similar general purposes - Part 1: General requirements (IEC 60320-1:2015)

Connecteurs pour usages domestiques et usages généraux analogues - Partie 1: Exigences générales (IEC 60320-1:2015)

Gerätesteckvorrichtungen für den Hausgebrauch und ähnliche allgemeine Zwecke -Teil 1: Allgemeine Anforderungen (IEC 60320-1:2015)

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European foreword

The text of document 23G/345/FDIS, future edition 3 of IEC 60320-1, prepared by SC 23G "Appliance couplers", of IEC/TC 23 "Electrical accessories" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60320-1:2015.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-04-29
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-07-29

This document supersedes EN 60320-1:2001.

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The text of the International Standard IEC 60320-1:2015 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60364-4-44	NOTE	Harmonized as HD 60364-4-44.
IEC 61140	NOTE	Harmonized as EN 61140.
ISO 1466	NOTE	Harmonized as EN ISO 1456.
ISO 2081	NOTE	Harmonized as EN ISO 2081.

Foreword to amendment A1

The text of document 23G/405/FDIS, future IEC 60320-1:2015/A1, prepared by SC 23G "Appliance couplers" of IEC/TC 23 "Electrical accessories" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60320-1:2015/A1:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2021-09-19
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-03-19

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60068-2-31	-	Environmental testing -- Part 2-31: Tests - Test Ec: Rough handling shocks, primarily for equipment-type specimens	EN 60068-2-31	-
IEC 60068-2-60	-	Environmental testing -- Part 2-60: Tests - Test Ke: Flowing mixed gas corrosion test	EN 60068-2-60 [1)]	-
IEC 60068-2-75	-	Environmental testing - Part 2-75: Tests - Test Eh: Hammer tests	EN 60068-2-75	-
IEC 60112	-	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112	-
IEC 60227	series	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V --	-	series
IEC 60245	series	Rubber insulated cables - Rated voltages up to and including 450/750 V	-	series
IEC 60320	series	Appliance couplers for household and similar general purposes	EN 60320	series
IEC 60320-3	2014	Appliance couplers for household and similar general purposes - Part 3: Standard sheets and gauges	EN 60320-3	2014
IEC 60417	-	Graphical symbols for use on equipment. Index, survey and compilation of the single sheets.	-	-
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems -- Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60695-2-10	-	Fire hazard testing -- Part 2-10: Abnormal heat - Ball pressure test method	EN 60695-2-10	-
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	EN 60695-2-11	2001

1) To be published

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IEC 60695-2-12	2000	Fire hazard testing -- Part 2-12: Glowing/hot-wire based test methods - Glow-wire flammability test method for materials	EN 60695-2-12	2001
IEC 60695-2-13	2000	Fire hazard testing -- Part 2-13: Glowing/hot-wire based test methods - Glow-wire ignitability test method for materials	EN 60695-2-13	2001
IEC 60695-10-2	-	Fire hazard testing -- Part 10-2: Abnormal heat - Ball pressure test method	EN 60695-10-2	-
IEC 60730-2-11	-	Automatic electrical controls for household and similar use -- Part 2-11: Particular requirements for energy regulators	EN 60730-2-11	-
IEC 60999-1	-	Connecting devices - Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units -- Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm² up to 35 mm² (included)	EN 60999-1	-
IEC 61058	series	Switches for appliances	EN 61058	series

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

APPLIANCE COUPLERS FOR HOUSEHOLD AND SIMILAR GENERAL PURPOSES –

Part 1: General requirements

FOREWORD

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International Standard IEC 60320-1 has been prepared by subcommittee 23G: Appliance couplers, of IEC technical committee 23: Electrical accessories.

This third edition cancels and replaces the second edition published in 2001 and Amendment 1:2007. This edition constitutes a technical revision.

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

a) Standard sheets moved from IEC 60320-1 to IEC 60320-3.
b) Clarification of requirements for non-standardized appliance couplers.

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

FDIS	Report on voting
23G/345/FDIS	23G/346/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.

A list of all the parts in the IEC 60320 series, under the general title *Appliance couplers for household and similar general purposes*, can be found on the IEC website.

Part 1 is to be used in conjunction with the following parts of the IEC 60320 series, if applicable.

IEC 60320-2-1, *Appliance couplers for household and similar general purposes – Part 2-1: Sewing machine couplers*

IEC 60320-2-3, *Appliance coupler for household and similar general purposes – Part 2-3: Appliance coupler with a degree of protection higher than IPX0*

IEC 60320-2-4, *Appliance couplers for household and similar general purposes – Part 2-4: Couplers dependent on appliance weight for engagement*

IEC 60320-3, *Appliance couplers for household and similar general purposes – Part 3: Standard sheets and gauges*

NOTE If these standards are referring to another edition of IEC 60320-1, that edition is applicable.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

A bilingual version of this publication may be issued at a later date.

The contents of the corrigenda of January 2016 and May 2019 have been included in this copy.

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APPLIANCE COUPLERS FOR HOUSEHOLD AND SIMILAR GENERAL PURPOSES –

Part 1: General requirements

1 Scope

This part of IEC 60320 sets the general requirements for appliance couplers for two poles and two poles with earth contact and for the connection of electrical devices for household and similar onto the mains supply.

This part of IEC 60320 is also valid for appliance inlets/appliance outlets integrated or incorporated in appliances.

The rated voltage does not exceed 250 V (a.c.) and the rated current does not exceed 16 A.

Appliance couplers complying with this part of IEC 60320 are suitable for normal use at ambient temperatures not normally exceeding +40 °C, but their average over a period of 24 h does not exceed +35 °C, with a lower limit of the ambient air temperature of –5 °C.

Appliance couplers are not suitable for

– use in place of plug and socket-outlet systems according to IEC 60884-1.
– use in place of devices for connecting luminaires (DCLs) according to IEC 61995 or luminaire supporting couplers (LSCs).

NOTE Requirements for d.c. are under consideration.

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 60068-2-31, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*

IEC 60068-2-60, *Environmental testing – Part 2-60: Tests – Test Ke: Flowing mixed gas corrosion test*

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

IEC 60112, *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 voltages up to and including 450/750 V*

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

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IEC 60320 (all parts), *Appliance couplers for household and similar general purposes*

IEC 60320-3:2014, *Appliance couplers for household and similar general purposes – Part 3: Standard sheets and gauges*

IEC 60417, *Graphical symbols for use on equipment* (available from: http://www.graphical-symbols.info/equipment)

IEC 60664-1:2007, *Insulation coordination for equipment within low voltage systems – Part 1: Principles, requirements and tests*

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 (GWEPT)*

IEC 60695-2-12:2000, *Fire hazard testing – Part 2-12: Glowing/hot-wire based test methods – Glow-wire flammability index (GWFI) test method for materials*

IEC 60695-2-13:2000, *Fire hazard testing – Part 2-13: Glowing/hot-wire based test methods – Glow-wire ignition temperature (GWIT) test method for materials*

A1 IEC 60695-10-2, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test method* A1

IEC 60730-2-11, *Automatic electrical controls for household and similar use – Part 2-11: Particular requirements for energy regulators*

IEC 60999-1, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm^2 up to 35 mm^2 (included)*

IEC 61032, *Protection of persons and equipment by enclosures – Probes for verification*

IEC 61058 (all parts), *Switches for appliances*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
appliance coupler
means enabling the connection and disconnection of an appliance or equipment to the supply

SEE: Figure 1.

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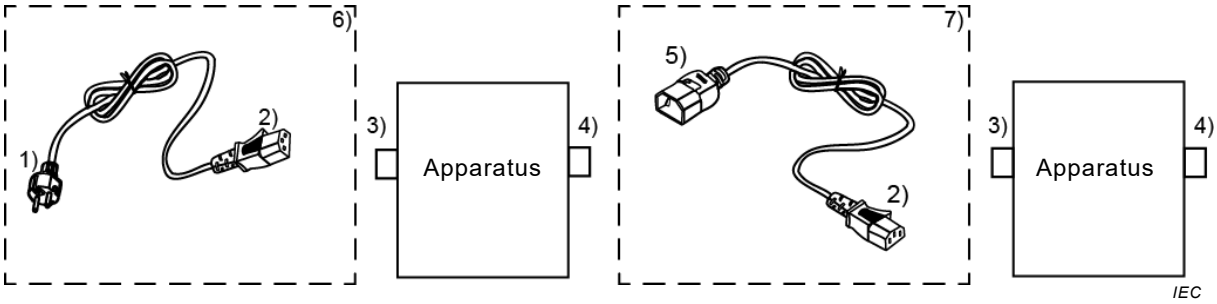

1 Plug
2 Connector (see 3.1.1)
3 Appliance inlet (see 3.1.2)
4 Appliance outlet (see 3.2.2)
5 Plug connector (see 3.2.1)
6 Cord set (see 3.5)
7 Interconnection cord set (see 3.6)

Figure 1 – Intended use of appliance couplers

3.1.1
connector
part of the appliance coupler integral with, or intended to be attached to, one cord connected to the supply

SEE: Figure 1.

[SOURCE: IEC 60050-442:1998, 442-07-02]

3.1.2
appliance inlet
part of the appliance coupler integrated as a part of an appliance or incorporated as a separate part in the appliance or equipment or intended to be fixed to it

SEE: Figure 1.

3.2
interconnection coupler
appliance coupler enabling the connection and disconnection of an appliance or equipment to a cord leading to another appliance or equipment

SEE: Figure 1.

Note 1 to entry: An interconnection coupler is a type of appliance coupler.

3.2.1
plug connector
part of the interconnection coupler integral with or intended to be attached to one cord

SEE: Figure 1.

[SOURCE: IEC 60050-442:1998, 442-07-09]

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3.2.2
appliance outlet
part of the interconnection coupler which is the part integrated or incorporated in the appliance or equipment or intended to be fixed to it and from which the supply is obtained

SEE: Figure 1.

[SOURCE: IEC 60050-442:1998, 442-07-08]

3.3
rewirable accessory
accessory so constructed that a cable or cord can be replaced

3.4
non-rewirable accessory
accessory so constructed that it forms a complete unit with flexible supply cable or cord after connection and assembly by the manufacturer of the accessory

3.5
cord set
assembly consisting of one cable or cord fitted with one non-rewirable plug and one non-rewirable connector, intended for the connection of an electrical appliance or equipment to the electrical supply

SEE: Figure 1.

3.6
interconnection cord set
assembly consisting of one cable or cord fitted with one non-rewirable plug connector and one non-rewirable connector, intended for the interconnection between two electrical appliances

SEE: Figure 1

[SOURCE: IEC 60050-442:1998, 442-07-06, modified – “a” has been changed to “one” in two places and a reference to Figure 1 has been added.]

3.7
integrated appliance coupler
appliance coupler which is formed by the housing or enclosure of the appliance or equipment and cannot be tested separately

3.8
incorporated appliance coupler
appliance coupler built in or fixed to an appliance or equipment, but that can be tested separately

3.9
base of a pin
part of the pin where it protrudes from the engagement face

3.10
retaining device
mechanical provision/arrangement which holds a connector in proper engagement with a corresponding appliance inlet and prevents its unintentional withdrawal

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3.11
rated voltage
voltage assigned by the manufacturer for a specified operating condition of an accessory

[SOURCE: IEC 60050-442:1998, 442-01-03]

3.12
rated current
current assigned by the manufacturer for a specified operating condition of an accessory

[SOURCE: IEC 60050-442:1998, 442-01-02]

3.13
terminal
part of an accessory to which a conductor is attached, providing a re-usable connection

[SOURCE: IEC 60050-442:1998, 442-06-05]

3.14
termination
part of an accessory to which a conductor is permanently attached

[SOURCE: IEC 60050-442:1998, 442-06-06]

3.15
thread-cutting screw
screw having an interrupted thread which, by screwing in, makes a thread by removing material from the cavity

[SOURCE: IEC 60050-442:1998, 442-06-03]

3.16
type test
test of one or more devices made to a certain design to show that the design meets certain requirements

[SOURCE: IEC 60050-811:1991, 811-10-04]

3.17
routine test
test to which each individual device is subjected during and/or after manufacture to ascertain whether it complies with certain criteria

[SOURCE: IEC 60050-811:1991, 811-10-05]

4 General requirements

Appliance couplers shall be so designed and constructed that in normal use their performance is reliable and without danger to the user or the surroundings.

Non-standardized appliance couplers shall comply with all safety requirements of this standard and shall be tested together with its counterpart.

Compliance is checked by carrying out all the tests specified.

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Appliance couplers according to this standard are not intended to be used in portable accessories covered by IEC TC 23.

5 General notes on tests

5.1 General

Tests shall be made to prove compliance with the requirements laid down in this standard, where applicable.

Tests are as follows:

– Type tests shall be made on representative samples of each accessory.
– Routine tests shall be conducted by the manufacturer and made on each accessory.
– Unless otherwise specified, the tests are carried out in the order of the clauses.
– Unless otherwise specified, appliance couplers are tested with their counterparts, complying with this standard.
– Appliance inlets and appliance outlets integrated or incorporated in an appliance or equipment are tested under the conditions of use of the equipment, the number of test samples then being the same as the number of test samples of equipment required according to the relevant standard for the equipment.
– Appliance couplers are considered to comply with this standard if there is not more than one failure of one test sample in one of the tests. If one test sample fails in a test, that test and those preceding which may have influenced the result of that test are repeated on another set of test samples, all of which shall then comply with the repeated tests.

Subclauses 5.2 to 5.3 are applicable to type tests. For number of samples and test sequences, see Annex C.

5.2 Test samples

Unless otherwise specified, the test samples are tested as delivered and under normal conditions assembled and installed as in normal use according to the manufacturer's instructions at an ambient temperature of 20 °C ± 5 °C; they are tested with a.c. at 50 Hz or 60 Hz. Tests shall not commence earlier than 168 h after manufacture.

Non-rewirable connectors/plug connectors, other than those forming part of a cord set, shall be submitted with a cord at least 1 m long.

5.3 Failures

In general, only the test which caused the failure need be repeated unless

a) a failure occurs to one of the three test samples when tested in accordance with Clauses 19, 20 or 21, in which case the tests are repeated from Clause 16 onwards; or
b) a failure occurs to one of the three test samples when tested in accordance with Clauses 22 or 23 (except 22.3), in which case the tests are repeated from Clause 18 onwards.

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

5.4 Routine tests

Routine tests are specified in Annex B.

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6 Standard ratings

6.1 The maximum permitted rated voltage is 250 V.

6.2 The maximum permitted rated current is 16 A.

Preferred rated currents for appliance couplers are 0,2 A, 2,5 A, 6 A, 10 A and 16 A.

NOTE For details of standard type ratings refer to IEC 60320-3.

7 Classification of appliance couplers

7.1 According to maximum pin temperature at the base of the pins of the corresponding appliance inlet or the socket contacts of the corresponding appliance outlet:

a) appliance couplers for cold conditions, pin temperature not exceeding 70 °C;

b) appliance couplers for hot conditions, pin temperature not exceeding 120 °C;

c) appliance couplers for very hot conditions, pin temperature not exceeding 155 °C.

NOTE Appliance couplers for hot conditions can also be used under cold conditions; appliance couplers for very hot conditions can also be used under cold or hot conditions.

7.2 According to the type of equipment to be connected:

a) appliance couplers for class I equipment;

b) appliance couplers for class II equipment.

NOTE 1 For a description of the classes, see IEC 61140.

NOTE 2 Appliance couplers for 0,2 A are intended only for the connection of small hand-held class II equipment, if allowed by the relevant standard for the equipment.

7.3 Connectors/plug connectors according to the method of connecting the cord:

a) rewirable;

b) non-rewirable.

8 Marking

8.1 General

Appliance couplers shall be marked with:

– name, trade mark or identification mark of the manufacturer or responsible vendor;

– type reference.

NOTE The type reference can be a catalogue number.

8.2 Additional markings

Connectors and plug connectors shall be additionally marked with:

– rated current in amperes, except for 0,2 A connectors;

– rated voltage in volts;

– symbol for nature of supply;

– the marking as specified in IEC 60999-1 to identify the type of conductors suitable for screwless terminals.

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8.3 Appliance couplers for class II equipment

Appliance couplers for class II equipment shall not be marked with the symbol for class II construction.

8.4 Symbols or alphanumeric notations

When symbols or alphanumeric notations are used, they shall be as follows:

amperes	A
volts	V
alternating current	AC or ~
protective earth	⏚ [IEC 60417-5019 (2006-08)] or PE
earth	⏚ [IEC 60417-5017 (2006-08)]
neutral terminal	N

For the marking of rated current and rated voltage, figures may be used alone, the figure for rated current being placed before or above that for rated voltage and separated from the latter by a line. The symbol for nature of supply shall be placed next to the marking for rated current and rated voltage.

NOTE 1 Examples for marking of current, voltage and nature of supply:

$$10\,\mathrm{A}\ 250\,\mathrm{V}\ \sim \quad \text{or} \quad 10/250\ \sim \quad \text{or} \quad \frac{10}{250}\ \sim \quad \text{or} \quad \left(\frac{10}{250}\ \sim\right)$$

NOTE 2 Lines formed by the construction of the tool are not considered as part of the marking.

8.5 Legibility of markings

The marking according to 8.1 of connectors/plug connectors shall still be easily discernible when the connector/plug connector is wired and ready for use.

NOTE The term "ready for use" does not imply that the connector is in engagement with an appliance inlet.

8.6 Terminal markings and wiring instructions

In rewirable, non-reversible connectors/plug connectors, terminals shall be indicated as follows:

– earthing terminal: the symbol ⏚ or PE
– neutral terminal: the letter N

In non-rewirable, polarized connectors/plug connectors, no marking of contacts is necessary, but conductors shall be connected as specified in 22.1.

Appliance inlets/appliance outlets, other than those integrated or incorporated in an appliance or equipment, for use with connectors/plug connectors according to 8.6 shall have terminal markings to correspond with 8.6.

Rewirable connectors/plug connectors shall be supplied with the following instructions:

a) a diagram illustrating the method of connection of the conductors, in particular the excess length of the earthing conductor;
b) a diagram illustrating the method of the operation of the cord anchorage;
c) a diagram showing the length of sleeving and insulation to be stripped back;

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d) the sizes and types of the suitable cable or cord.

NOTE Connectors/plug connectors supplied directly to an equipment manufacturer do not need these instructions with each unit, but will be made available to the equipment manufacturer.

8.7 Durability

The marking required by the standard shall be easily legible and durable. The marking shall not be placed on screws, removable washers or other removable parts.

8.8 Test and inspection

Compliance with the requirements of 8.1 to 8.7 is checked by inspection and by the following test.

The marking is rubbed by hand for 15 s with a piece of cloth soaked with water and again for 15 s with a piece of cloth soaked with petroleum spirit.

After this test and all non-destructive tests of the standard, the marking shall remain legible. It shall not be easily possible to remove labels and they shall not show curling.

Marking made by moulding, pressing or engraving is not subjected to this test.

9 Dimensions and compatibility

9.1 General

Appliance couplers shall be designed and constructed so that unintended or improper connection is prevented.

Compliance is checked by inspection and in case of doubt by the test according to 9.2 to 9.5.

9.2 Single-pole connections

A1 It shall not be possible to make single-pole connections between connectors/appliance outlets and appliance inlets/plug connectors. A1

Compliance is checked by manual test.

9.3 Compatibility

It shall not be possible to engage:

– connectors for class II equipment in appliance inlets/plug connectors for class I equipment;
– plug connectors for devices of the protection class I in connectors/appliance outlets for devices of the protection class II;
– connectors for cold conditions in appliance inlets/plug connectors for hot or very hot conditions;
– plug connectors for cold conditions in appliance outlets for hot or very hot conditions;
– connectors for hot conditions in appliance inlets/plug connectors for very hot conditions;
– plug connectors for hot conditions in appliance outlets for very hot conditions;
– connectors in appliance inlets/plug connectors having a higher rated current than the connector.
– plug connectors in appliance outlets having a lower rated current than the plug connector.

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