

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Appliances couplers for household and similar general purposes –
Part 1: General requirements**

**Connecteurs pour usages domestiques et usages généraux analogues –
Partie 1: Prescriptions générales**

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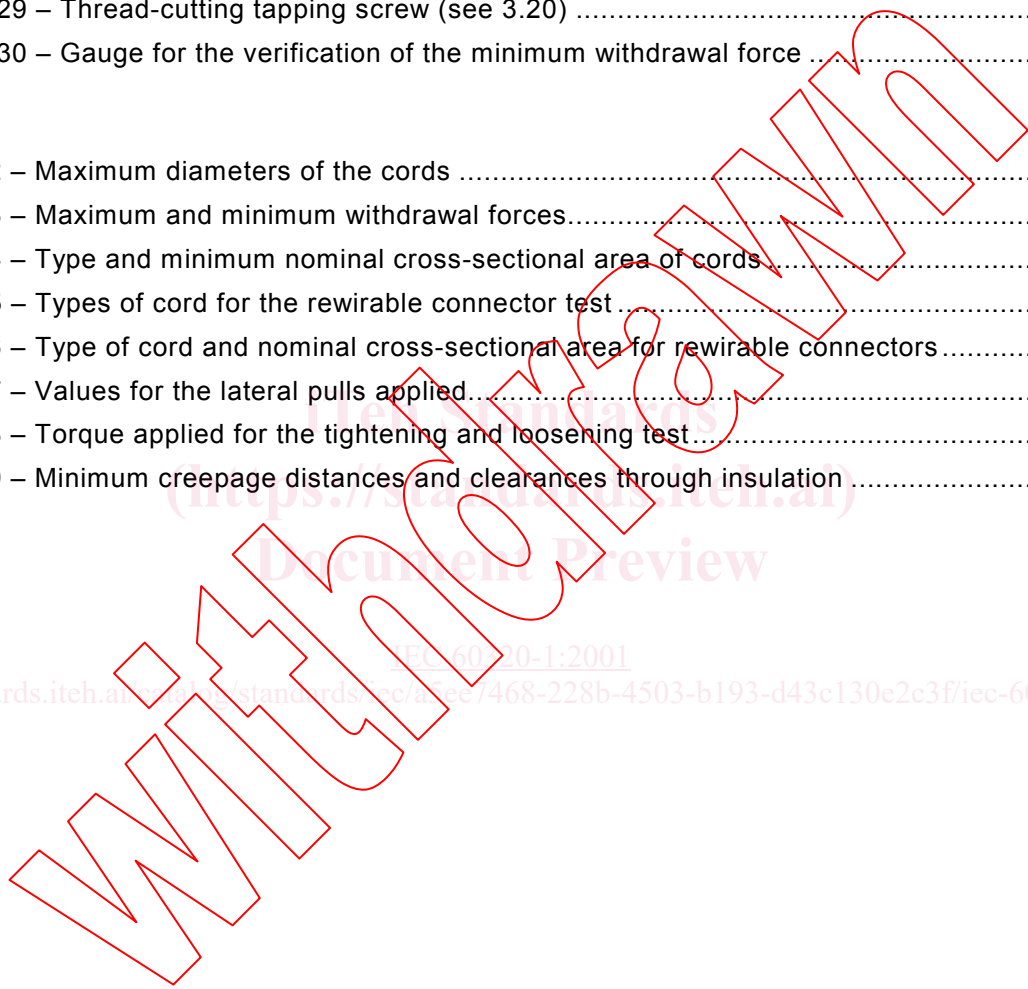
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**APPLIANCE COUPLERS FOR HOUSEHOLD
AND SIMILAR GENERAL PURPOSES –****Part 1: General requirements**

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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 consolidated version of IEC 60320-1 consists of the second edition (2001) [documents 23G/215/FDIS and 23G/218/RVD] and its amendment 1 (2007) [documents 23G/272/FDIS and 23G/274/RVD].

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 2.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

Annex A forms an integral part of this standard.

IEC 60320 consists of the following parts, under the general title: *Appliance couplers for household and similar general purposes*:

- Part 2-1: Sewing machine couplers
- Part 2-2: Interconnection couplers for household and similar equipment
- Part 2-3: Appliance couplers with a degree of protection higher than IPX0

The committee has decided that the contents of the base publication and its amendments 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

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APPLIANCE COUPLERS FOR HOUSEHOLD AND SIMILAR GENERAL PURPOSES –

Part 1: General requirements

1 Scope

This part of IEC 60320 is applicable to two-pole appliance couplers for a.c. only, with or without earthing contact, with a rated voltage not exceeding 250 V and a rated current not exceeding 16 A, for household and similar general purposes and intended for the connection of a supply cord to electrical appliances or other electrical equipment for 50 Hz or 60 Hz supply.

NOTE 1 Appliance inlets integrated or incorporated in appliances or other equipment are within the scope of this standard. The dimensional and general requirements of this standard apply to such inlets, but certain tests may not be relevant.

NOTE 2 The requirements for connectors are based on the assumption that the temperature of the pins of the corresponding appliance inlets does not exceed

- 70 °C for connectors for cold conditions;
- 120 °C for connectors for hot conditions;
- 155 °C for connectors for very hot conditions.

NOTE 3 Appliance couplers complying with this standard are suitable for use at ambient temperatures not normally exceeding 25 °C, but occasionally reaching 35 °C.

NOTE 4 Appliance couplers complying with the standard sheets in this standard are intended for the connection of equipment having no special protection against moisture. If appliance couplers are used with equipment which may be subject to spillage of liquid in normal use then protection against moisture is to be provided by the equipment.

NOTE 5 Special constructions may be required

- in locations where special conditions prevail, for example, as in ships, vehicles and the like;
- in hazardous locations, for example, where explosions are liable to occur.

2 Normative references

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.

IEC 60050(151):1978, *International Electrotechnical Vocabulary (IEV) – Chapter 151: Electrical and magnetic devices*

IEC 60068-2-32:1975, *Environmental testing – Part 2: Tests – Test Ed: Free fall*

IEC/TR 60083:1997, *Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC*

IEC 60112:1979, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions*

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*

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

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

IEC 60730 (all parts), *Automatic electrical controls for household and similar use*

IEC 60999-1:1999, *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)*

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

IEC 61140:1997, *Protection against electric shock – Common aspects for installation and equipment*

ISO 286-1:1988, *ISO system of limits and fits – Part 1: Bases of tolerances, deviations and fits*

ISO 1101:1983, *Technical drawings – Geometrical tolerancing – Tolerancing of form, orientation, location and run-out – Generalities, definitions, symbols, indications on drawings*

ISO 1456:1988, *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

Where the terms "voltage" and "current" are used, they imply the r.m.s. values, unless otherwise specified.

For the purpose of this International Standard, the following definitions apply.

The term "**accessory**" is used as a general term covering connectors and/or appliance inlets (and, in some cases, plugs as well).

3.1

appliance coupler

means enabling the connection and disconnection at will, of a cord to an appliance or other equipment. It consists of two parts: a connector and an appliance inlet

3.2

connector

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

NOTE Only one cord is connected to the connector.

3.3

appliance inlet

part of the appliance coupler integrated or incorporated in the appliance or equipment or intended to be fixed to it

NOTE 1 An appliance inlet integrated in an appliance or equipment is an appliance inlet (the shroud and base of) which is formed by the housing of the appliance or equipment.

NOTE 2 An appliance inlet incorporated in an appliance or an equipment is a separate appliance inlet built in or fixed to an appliance or equipment.

3.4

rewirable accessory

accessory so constructed that the cord can be replaced

3.5

non-rewirable accessory

accessory so constructed that it forms a constructional unit with the cord which is assembled by the manufacturer of the accessory. This unit shall be such that

- the cord cannot be separated from the accessory without making this permanently useless, and
- the accessory cannot be opened by hand or by using a general purpose tool, for example a screwdriver, as intended

NOTE An accessory is considered to be permanently useless when for re-assembling the accessory, parts or materials other than the original are to be used.

3.6

cord set

assembly consisting of one 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

3.7

base of a pin

part of the pin where it protrudes from the engagement face

3.8

retaining device

mechanical arrangement which holds a connector in proper engagement with a corresponding appliance inlet and prevents its unintentional withdrawal

3.9

rated voltage

voltage assigned to the accessory by the manufacturer

3.10

rated current

current assigned to the accessory by the manufacturer

3.11

terminal

part to which a conductor is attached, providing a re-usable connection

3.12

termination

part to which a conductor is permanently attached

3.13**screw-type terminal**

terminal for the connection and subsequent disconnection of a conductor, the connection being made, directly or indirectly by, means of screws or nuts of any kind

3.14**pillar terminal**

screw-type terminal in which the conductor is inserted into a hole or cavity, where it is clamped under the shank of a screw. The clamping pressure may be applied directly by the shank of the screw or through an intermediate clamping plate to which pressure is applied by the shank of the screw

3.15**screw terminal**

screw-type terminal in which the conductor is clamped under the head of a screw. The clamping pressure may be applied directly by the head of the screw or through an intermediate part, such as a washer, clamping plate or anti-spread device

3.16**stud terminal**

screw-type terminal in which the conductor is clamped under a nut. The clamping pressure may be applied directly by a suitably shaped nut or through an intermediate part, such as a washer, clamping plate or anti-spread device

3.17**screwless terminal**

connecting terminal for the connection and subsequent disconnection of a conductor, the connection being made, directly or indirectly, by means of springs, wedges, eccentrics, cones, etc.

3.18**tapping screw**

screw manufactured from a material having a higher resistance to deformation when applied by rotary insertion into a hole in a material having a lower resistance to deformation

NOTE The screw is made with a tapered thread, the taper being applied to the core diameter of the thread at the end section of the screw. The thread produced by application of the screw is formed securely only after sufficient revolutions have been made to exceed the number of threads on the tapered section.

3.19**thread-forming tapping screw**

tapping screw having an uninterrupted thread. It is not a function of this thread to remove material from the hole

NOTE An example of a thread-forming tapping screw is shown in figure 28.

3.20**thread-cutting tapping screw**

tapping screw having an interrupted thread. It is a function of this thread to remove material from the hole

NOTE An example of a thread-cutting tapping screw is shown in figure 29.

3.21

type test

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

[IEV 151-04-15]

3.22

routine test

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

[IEV 151-04-16]

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 surroundings.

In general, compliance is checked by carrying out all the tests specified.

NOTE It is to be understood that appliance couplers are to be capable of meeting all the relevant requirements and tests specified in this standard.

5 General notes on tests

5.1 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 manufactured to this standard, where applicable.

Subclauses 5.2 to 5.7 are applicable to type tests and 5.8 to routine tests.

5.2 Unless otherwise specified, the specimens are tested as delivered and under normal conditions of use, at an ambient temperature of $20\text{ °C} \pm 5\text{ °C}$; they are tested with a.c. at 50 Hz or 60 Hz.

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

5.3 Unless otherwise specified, the tests are carried out in the order of the clauses.

5.4 Unless otherwise specified, connectors and appliance inlets are tested in conjunction with an appropriate appliance inlet or connector, complying with this standard.

5.5 For appliance inlets, three specimens are subjected to the tests specified.

For connectors, nine specimens (11 if of elastomeric or thermoplastic material) are required:

- set 1 of three specimens is subjected to the tests specified, with the exception of those of clauses 14, 15, 16, 19, 20 and 21 and of 22.4 and 24.2;
- set 2 of three specimens is subjected to the tests of clauses 14, 15, 16, 19, 20 and 21 (including the repetition of the tests of clause 16);
- set 3 of three specimens is subjected to the test of 22.4;
- set 4 of two specimens of elastomeric or thermoplastic material is subjected to the test of 24.2 (including the preconditioning according to clause 16).

For non-rewirable connectors with indicators, three additional specimens with one pole of the indicator disconnected are required for the tests of clause 15.

5.6 Appliance inlets integrated or incorporated in an appliance or equipment are tested under the conditions of use of the equipment, the number of specimens then being the same as the number of specimens of equipment required according to the relevant standard for the equipment.

5.7 Connectors and appliance inlets are considered not to comply with this standard if there are more failures than that of one specimen in one of the tests. If one specimen fails in a test, that test and those preceding which may have influenced the result of that test are repeated on another set of specimens of the number specified in 5.5, all of which shall then comply with the repeated tests.

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

- a) a failure occurs to one of the three specimens of set 2 specified in 5.5, when tested in accordance with clauses 19, 20 or 21, in which case the tests required by 5.5 for set 2 are repeated from clause 16 onwards; or
- b) a failure occurs to one of the three specimens of set 1 specified in 5.5, when tested in accordance with clauses 22 or 23 (except 22.4), in which case the tests required by 5.5 for set 1 are repeated from clause 18 onwards.

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

5.8 Routine tests are specified in annex A.

6 Standard ratings

6.1 The standard rated voltage is 250 V.

6.2 Standard rated currents are 0,2 A, 2,5 A, 6 A, 10 A and 16 A, as specified in 9.1.

Compliance with the requirements of 6.1 and 6.2 is checked by visual inspection of the marking.