

Australian/New Zealand Standard™

**Appliance couplers for household and
similar general purposes**

**Part 2.2: Interconnection couplers for
household and similar equipment (IEC
60320-2-2, Ed. 2.0 (1998) MOD)**



AS/NZS 60320.2.2:2004

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Australian/New Zealand Standard™

Appliance couplers for household and similar general purposes

Part 2.2: Interconnection couplers for household and similar equipment (IEC 60320-2-2, Ed. 2.0 (1998) MOD)

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-004, Electrical Accessories.

This Standard forms the first edition of AS/NZS 60320.2.2, *Appliance couplers for household and similar general purposes*, Part 2.2: *Interconnection couplers for household and similar equipment*.

The objective of this Standard is to provide Australian and New Zealand electrical industries, manufacturers and regulatory bodies with safety requirements for interconnection couplers for household and similar equipment for household and similar general purposes, and which may be used as the basis for approval for sale or for connection to supply in Australia and New Zealand. This Standard is to be used in conjunction with AS/NZS 60320.1.

This Standard is an adoption with national modifications and contains the full text of IEC 60320-2-2, Ed. 2.0 (1998), *Appliance couplers for household and similar general purposes Part 2-2: Interconnection couplers for household and similar equipment*.

The clauses of this Standard supplement or modify the corresponding clauses of AS/NZS 60320.1. When a particular clause of AS/NZS 60320.1 is not mentioned in this Standard, the clause of AS/NZS 60320.1 applies without modification as far as is reasonable. Where this Standard states 'addition', 'modification' or 'replacement', the relevant requirement, test specification or explanatory matter in AS/NZS 60320.1 should be adapted accordingly.

Clauses which are additional to those in AS/NZS 60320.1 are numbered starting from 101.

Where in AS/NZS 60320.1 the words 'appliance coupler', 'connector' or 'appliance inlet' appear, they should be deleted and replaced by 'interconnection coupler', 'plug connector' or 'appliance outlet' respectively.

Variations to IEC 60320-2-2 are indicated at the appropriate places throughout this standard. Strikethrough (~~example~~) identifies IEC text, tables and figures which, for the purposes of this Australian/New Zealand Standard, are deleted. Where text, tables or figures are added, each is set in its proper place and identified by shading (**example**). Added figures are not themselves shaded, but are identified by a shaded border.

The essential safety requirements in AS/NZS 3820 that could be applicable to interconnection couplers for household and similar equipment are covered by this Standard taken in conjunction with any other relevant requirements affecting safety.

The terms 'normative' and 'informative' are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) A full point should be substituted for a comma when referring to a decimal marker.
- (c) In Clauses 15.2, 22.3 and 22.4, replace IEC 'Type of cord' with the following:
 - (i) 60227 IEC 53 – Ordinary duty PVC insulated sheathed.
 - (ii) 60245 IEC 53 – Ordinary duty elastomer insulated sheathed.

The numbering of clauses, subclauses, notes, tables, figures and annexes follows that of IEC 60320-1. To allow for additional material to be introduced by Australia and New Zealand, the numbers 201 to 300 are used to number further clauses, subclauses, notes, tables and figures in this Standard.

This scheme has been introduced to reduce the likelihood of the IEC and Australia or New Zealand using the same clause or figure number for differing requirements. The use of the word VOID indicates that the IEC requirement is not used in Australia or New Zealand. The word is also used where the deletion of a particular requirement such as a Table would lead to the consequential renumbering of references within the body of the Standard and succeeding tables. Where Australia and New Zealand have added a requirement or made a change to a particular clause of IEC 60320-1 that clause number remains unchanged.

This Standard does not purport to include all the necessary conditions of a contract.

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Australian/New Zealand Standard

Appliance couplers for household and similar general purposes
Part 2.2: Interconnection couplers for household and similar equipment
(IEC 60320-2-2, Ed. 2.0 (1998) MOD)

Any table, figure or text of the international standard that is struck through is not part of this standard. Any Australian/New Zealand table, figure or text that is added is part of this standard and is identified by shading.

1 Scope

This clause of ~~IEC 60320-1~~ **AS/NZS 60320.1** is replaced as follows:

This standard is applicable to two-pole interconnection couplers for a.c. only, with and without earthing contact, with a rated voltage not exceeding 250 V and a rated current not exceeding 16 A, for household and similar appliances and equipment and intended for the interconnection of the electrical supply to electrical appliances or equipment for 50 Hz or 60 Hz supply.

NOTE 1 – Appliance outlets integrated in 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 outlets, but certain tests may not be relevant.

NOTE 2 – The requirements for plug connectors are based on the assumption that the temperature of the socket contacts of the corresponding appliance outlets does not exceed 65 °C (cold conditions).

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

NOTE 4 – Interconnection couplers complying with the standard sheets in this standard are intended for the interconnection of appliances or equipment having no special protection against moisture; for the interconnection of other appliances or equipment and of an appliance or equipment which is subject to spillage of liquid in normal use, additional requirements are necessary.

NOTE 5 – Special constructions may be required

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

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60320. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 60320 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

~~IEC 60083:1997, Plugs and socket outlets for domestic and similar general use standardized in member countries of IEC~~

AS/NZS 3112, Approval and test specification—Plugs and socket outlets

~~IEC 60320-1:1994, Appliance couplers for household and similar general purposes—Part 1: General requirements~~

AS/NZS 60320.1, *Appliance couplers for household and similar general purposes, Part 1: General requirements*

IEC 60536:1976, Classification of electrical and electronic equipment with regard to protection against electric shock

IEC 60906 (all parts), *IEC system of plugs and socket-outlets for household and similar purposes*

~~ISO 1101, — Geometrical Product Specifications (GPS) — Geometrical tolerancing — Generalities, definitions, symbols, indication on drawings~~

AS 1100.101, *Technical drawing—General principles*

AS/NZS 3100, *Approval and test specification—General requirements for electrical equipment*

AS/NZS 3120, *Approval and test specification—Cord extension sets*

3 Definitions

This clause of ~~IEC 60320-1~~ AS/NZS 60320.1 applies with the following additions:

Additional definitions:

3.101 An **interconnection coupler** is a means enabling the connection and disconnection at will of an appliance or equipment to a cord leading to another appliance or equipment.

It consists of two parts:

- a **plug connector**, which is the part integral with, or intended to be attached to, the cord;
- an **appliance outlet**, 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.

NOTE – An appliance outlet integrated in an appliance or equipment is an appliance outlet (the shroud and bottom of) which is formed by the housing of the appliance or equipment. An appliance outlet incorporated in an appliance or equipment is a separate appliance outlet built in or fixed to an appliance or equipment.

3.3 *Replacement:*

The term "accessory" is used as a general term covering plug connectors and/or appliance outlets.

4 General requirements

This clause of ~~IEC 60320-1~~ AS/NZS 60320.1 is replaced as follows.

Interconnection 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.

5 General notes on tests

This clause of ~~IEC 60320-1~~ **AS/NZS 60320.1** applies amended as follows:

5.4 Replacement:

Unless otherwise specified, plug connectors and appliance outlets are tested in conjunction with an appropriate appliance outlet or plug connector complying with this standard.

5.5 Replacement:

For appliance outlets, six specimens are required, three of which are subjected to the tests specified with the exception of those of clauses 14, 15, 16, 19, 20 and 21; the other three specimens are subjected to the tests of clauses 14, 15, 16, 19, 20 and 21 (including the repetition of the test of 16.2).

For plug connectors, nine specimens are required, three of which are subjected to the tests specified with the exception of those of clauses 14, 15 and 17 and subclauses 22.4 and 24.2; three other specimens are subjected to the tests of clauses 14, 15 and 17; the other three specimens are subjected to the test of 22.4.

For plug connectors of rubber or similar material, two additional specimens are required which are subjected to the test of 24.2.1.

For plug connectors of polyvinyl chloride (PVC) or similar material, two additional specimens are subjected to the test of 24.2.3.

Accordingly, for plug connectors the total number of specimens is:

Plug connector made of	Number of specimens
Rigid insulating material	9
PVC, rubber or similar material	11

6 Standard ratings

This clause of ~~IEC 60320-1~~ **AS/NZS 60320.1** applies amended as follows:

6.2 Replacement:

Standard rated currents are 2,5 A, 10 A and 16 A as specified in 9.1 of this standard.

7 Classification

This clause of ~~IEC 60320-1~~ **AS/NZS 60320.1** applies amended as follows:

Replacement:

7.1 Interconnection couplers are classified according to the type of appliance or equipment to be connected:

- interconnection couplers for class I equipment;

- interconnection couplers for class II equipment.

NOTE – For a description of the classes, see IEC 60536.

7.2 Plug connectors are, moreover, classified according to the method of connecting the cord:

- rewirable plug connectors;
- non-rewirable plug connectors.

8 Marking

This clause of ~~IEC 60320-1~~ **AS/NZS 60320.1** applies amended as follows:

8.1 *Replacement:*

Plug connectors shall be marked with:

- rated current in amperes;
- rated voltage in volts;
- symbol for nature of supply;
- name, trade mark or identification mark of the manufacturer or of the responsible vendor;
- type reference.

NOTE – The type reference may be a catalogue number.

8.2 *Replacement:*

Appliance outlets other than those integrated in an appliance or equipment shall be marked with

- the name, trade mark or identification mark of the manufacturer or of the responsible vendor, and
- a type reference, the latter being not visible after the appliance outlet is correctly mounted or when a plug connector is in engagement.

NOTE – The type reference may be a catalogue number.

8.3 *Replacement:*

Plug connectors and appliance outlets for class II equipment shall not be marked with the symbol for class II construction.

8.5 *Replacement:*

The marking specified in 8.1 shall be easily discernible when the plug connector is wired ready for use.

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

8.6 *Replacement:*

In non-reversible plug connectors, the contact positions shall be established by looking at the engagement face of the plug connectors and their disposition shall be as follows:

earthing contact: upper central position;

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line contact: lower left-hand position;
 neutral contact: lower right-hand position.

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

earthing terminal: the symbol  ;
 neutral terminal: the letter N.

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

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

The marking symbol or letters shall not be placed on screws, removable washers or other removable parts.

NOTE – The requirement concerning the marking of terminals and the connection of conductors has been introduced to align with the corresponding requirement for appliance couplers, which was introduced to take account of those countries which require a polarized supply system and the introduction of the IEC plug and socket-outlet system (see IEC 60906).

9 Dimensions and compatibility

This clause of ~~IEC 60320-1~~ **AS/NZS 60320.1** applies amended as follows:

Replacement:

9.1 Interconnection couplers shall comply with the appropriate standard sheets as specified below, except as permitted by 9.6:

2,5 A 250 V interconnection coupler for class I equipment:

- plug connector Sheet A
- appliance outlet Sheet B

2,5 A 250 V interconnection coupler for class II equipment:

- plug connector Sheet C
- appliance outlet Sheet D

10 A 250 V interconnection coupler for class I equipment:

- plug connector Sheet E
- appliance outlet Sheet F

10 A 250 V interconnection coupler for class II equipment:

- plug connector Sheet G
- appliance outlet Sheet H

16 A 250 V interconnection coupler for class I equipment

- plug connector Sheet I
- appliance outlet Sheet J

16 A 250 V interconnection coupler for class II equipment:

- plug connector Sheet K
- appliance outlet..... Sheet L

Compliance is checked by measurement or by means of gauges at an ambient temperature of $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

The accessories shall be tested with the gauges according to the following table:

Accessory to be tested	Gauge
10 A plug connectors of standard sheets E and G	Figure 9H
16 A plug connectors of standard sheets I and K	Figure 9M
10 A appliance outlet of standard sheet F	Figure 101
10 A appliance outlet of standard sheet H	Figure 102
16 A appliance outlet of standard sheet J	Figure 103
16 A appliance outlet of standard sheet L	Figure 104

9.2 Provision, if any, for retaining the plug connector in the appliance outlet shall comply with standard sheet... (under consideration).

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

~~Appliance outlets shall not allow improper connections with plugs complying with IEC 60083~~

Appliance outlets shall not allow improper connections with plugs complying with AS/NZS 3112.

~~Plug connectors shall not allow improper connections with portable socket outlets complying with the same IEC 60083 nor with connectors complying with IEC 60320-1~~

Plug connectors shall not allow improper connections with cord extension sockets complying with AS/NZS 3120 and designed for use with plugs complying with Figure 2.1 of AS/NZS 3112 nor with connectors complying with AS/NZS 60320.1.

Compliance is checked by manual test.

NOTE 1 – Improper connections include single-pole connections and other connections which do not comply with the requirements concerning protection against electric shock.

NOTE 2 – Conformity to the standard sheets ensures compliance with these requirements.

9.4 It shall not be possible to engage

- plug connectors for class I equipment with appliance outlets for class II equipment;
- plug connectors with appliance outlets having a lower rated current than the plug connector.

Compliance is checked by inspection, by manual test and by means of gauges at an ambient temperature of $35\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

NOTE 1 – Conformity to the standard sheets ensures compliance with the requirements, other than those verified by means of the gauges.

NOTE 2 – Gauges are under consideration.

9.5 Not applicable.

10 Protection against electric shock

This clause of ~~IEC 60320-1~~ AS/NZS 60320.1 applies amended as follows:

10.1 Replacement:

Interconnection couplers shall be so designed that live parts are not accessible when the plug connector is in partial or complete engagement.

Appliance outlets shall be so designed that live parts are not accessible when the appliance outlet is properly mounted as in normal use.

Compliance is checked by inspection and, if necessary, by a test with the standard test finger shown in figure 10.

This finger is applied in every possible position, an electrical indicator being used to show contact with the relevant parts. For plug connectors and appliance outlets with shrouds, enclosures or bodies of rubber or thermoplastic material, the standard test finger is applied for 30 s with a force of 20 N at all points where yielding of the insulating material could impair the safety of the plug connector; this test is made at an ambient temperature of $35\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

NOTE 1 – The standard test finger must be so designed that each of the jointed sections can be turned through an angle of 90° with respect to the axis of the finger in the same direction only.

NOTE 2 – An electrical indicator with a voltage between 40 V and 50 V is used to show contact with the relevant part.

NOTE 3 – Conformity to the standard sheets ensures compliance with the requirements so far as the inaccessibility of contact members during insertion of a plug connector into an appliance outlet is concerned.

10.2 Replacement:

It shall not be possible to make connection between a pin of a plug connector and a contact of an appliance outlet as long as any live part of the pins is accessible.

Compliance is checked by manual test and by the test of 10.1.

NOTE – Conformity to the standard sheets ensures compliance with the requirements.

10.4 Replacement:

External parts of plug connectors and of appliance outlets, with the exception of assembly screws and the like, shall be of insulating material.

Compliance is checked by inspection.

NOTE 1 – The suitability of the insulating material is checked during the insulation tests of clause 15.

NOTE 2 – Lacquer or enamel is not considered to be insulating material for the purposes of 10.1 to 10.4.

11 Provision for earthing

This clause of ~~IEC 60320-1~~ AS/NZS 60320.1 applies amended as follows:

11.2 Replacement:

Interconnection couplers with earthing contact shall be so constructed that, when inserting the plug connector, the earth connection is made before the current-carrying contacts of the plug connector are energized.

When withdrawing a plug connector, the current-carrying contacts shall separate before the earth connection is broken.

~~For interconnection couplers not complying with the standard sheets, compliance is checked by inspection of drawings, taking into account the effect of tolerances, and by checking the specimens against these drawings.~~

NOTE – Conformity to the standard sheets ensures compliance with the requirement.

12 Terminals and terminations

This clause of IEC 60320-1 AS/NZS 60320.1 applies.

13 Construction

This clause of IEC 60320-1 AS/NZS 60320.1 applies amended as follows:

13.1 Replacement:

Interconnection couplers shall be so designed that there is no risk of accidental contact between the earthing contact of the plug connector and the current-carrying contacts of the appliance outlet.

Compliance is checked by inspection.

NOTE – Conformity to the standard sheets ensures compliance with this requirement.

13.3 Replacement:

Pins of plug connectors and contacts of appliance outlets shall be locked against rotation.

Compliance is checked by inspection and by manual test.

NOTE – Clamping screws may serve to prevent contacts from rotating.

13.4 Replacement:

Pins of plug connectors shall be securely retained and shall have adequate mechanical strength. They shall be surrounded by a shroud and it shall not be possible to remove them without the aid of a tool.

The security of the pin retention is checked by inspection and, in case of doubt, by the following test.

The specimen is heated to a temperature of $70\text{ °C} \pm 2\text{ °C}$ for 1 h and maintained at this temperature for the duration of the test, including the 5 min period after removal of the test load.

The plug connector is held firmly in such a manner that there will be no undue squeezing or distortion of the body, and the means of holding shall not assist in maintaining the pins in their original position.

Each pin is subjected to a force of $60\text{ N} \pm 0,6\text{ N}$, applied without jerks, in a direction along the axis of the pin and maintained at this value for a period of 60 s.