AS/NZS 3122:2005

Australian/New Zealand Standard™

Approval and test specification—Socket-outlet adaptors

STANDARDS AUSTRALIA

STANDARDS NEW ZEALAND
Paerewa Aotearoa

AS/NZS 3122:2005

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Australian/New Zealand Standard™

Approval and test specification—Socket-outlet adaptors

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-004, Electrical Accessories to supersede AS/NZS 3122:1993, *Approval and test specification—Socket-outlet adaptors* on publication.

The objective of this Standard is to provide the Australian and New Zealand electrical industry including manufacturers, test laboratories and regulators with requirements and test methods for electrical portable outlet devices.

This Standard is one of a series of approval and test specifications to be read in conjunction with AS/NZS 3100, *Approval and test specifications—General requirements for electrical equipment*. The purpose of this series is to outline conditions which must be met to secure approval for the sale and use of electrical equipment in Australia and New Zealand. Only safety matters and related conditions are covered.

The essential safety requirements in AS/NZS 3820 that could be applicable to socket-outlet adaptors are covered by this Standard taken in conjunction with any other relevant requirements affecting safety.

This Standard was revised to incorporate Amendments 1 and 2 to AS/NZS 3122:1993 and to introduce the following technical and editorial changes:

(a) Modification of Clause 7 to include additional requirements from AS/NZS 3112.

(b) Inclusion of requirements for travel adaptors in Appendix A.

(c) Updating of cross-references to referred Standards and other minor editorial changes.

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

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
Approval and test specification—Socket-outlet adaptors

1 SCOPE

This Standard applies to socket-outlet adaptors, as defined in Clause 4, and intended for use at low or extra-low voltage.

NOTE: As of 1 November 1990, Australian regulatory authorities will not approve rewirable socket-outlet adaptors.

2 APPLICATION

2.1 General requirements of AS/NZS 3100

This Standard shall be read in conjunction with AS/NZS 3100 and the appropriate provisions of AS/NZS 3100 shall apply to the construction of a socket-outlet adaptor and the insulation and safeguarding of parts which normally carry current.

2.2 Specific requirements of this Standard

A socket-outlet adaptor shall be deemed to comply with this Standard only if it complies with all requirements of this Standard and passes the specified tests.

3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

IEC

60384	Fixed capacitors for use in electronic equipment
60384-14	Part 14: Sectional specification—Fixed capacitors for electromagnetic interference suppression and connection to the supply mains

APPROVAL AND TEST SPECIFICATIONS

AS/NZS

3100	General requirements for electrical equipment
3112	Plugs and socket-outlets
3120	Cord extension sockets
3199	Cord extension sets

4 DEFINITIONS

For the purpose of this Standard the definitions below apply.

4.1 Non-rewirable socket-outlet adaptor

A socket-outlet adaptor so constructed that it forms an integral unit with any flexible cable or cord, such that—

(a) any flexible cable or cord cannot be detached from the accessory without making the accessory useless; or

(b) any flexible cord cannot be replaced by hand or by using a general purpose tool.

4.2 Plug portion

The portion of the socket-outlet adaptor which carries the pins intended for making a detachable connection with the contacts of a socket-outlet. For socket-outlet adaptors incorporating flat-pins, the 'plug portion' includes all parts dimensioned in accordance with AS/NZS 3112.

4.3 Rewirable socket-outlet adaptor

A socket-outlet adaptor so constructed that any flexible cable or cord can be replaced.

4.4 Socket-outlet adaptor

An accessory for insertion into a socket-outlet and containing metal contacts, to accommodate one or two plugs, or a flexible cord and one plug.

4.5 Socket portion

The portion of the socket-outlet adaptor which carries the contacts intended for making a detachable connection with the pins of a plug.

5 PROHIBITED FEATURES

Socket-outlet adaptors shall not—

(a) have more than two outlets, the term 'outlet' being deemed to include facilities for the connection of a flexible cord;

(b) have more than one outlet for a flexible cord;

(c) have an outlet in the form of a lampholder;

(d) be capable of insertion in a lampholder;

(e) incorporate a plug portion having only two pins and an outlet providing for the connection of other than a 2-pin plug or a 2-core flexible cord;

(f) incorporate a plug portion having an earthing pin and an outlet not provided with an earthing terminal or earthing contact for each plug configuration able to be used with the adaptor;

(g) incorporate any fuse or thermal overload device;

(h) have an outlet providing for the connection of a plug having a current rating exceeding that of the plug portion of the adaptor;

(i) have an outlet with a current rating exceeding 20 A;

(j) have an outlet with a voltage rating exceeding low voltage; and

(k) have an outlet with polarity differing from that of the plug portion of the adaptor.

6 EXTRA-LOW VOLTAGE TYPES

Extra-low voltage socket-outlet adaptors are not required to comply with Clauses 15 and 17.

7 PLUG AND SOCKET PORTIONS

The socket portion of the adaptors shall comply with the appropriate requirements of AS/NZS 3112.

The plug portion of adaptors with integral pins for insertion into socket-outlets shall comply with the requirements for equipment with integral pins for insertion into socket-outlets in accordance with AS/NZS 3112.

8 INSULATING MATERIALS

The insulating portions of a socket-outlet adaptor shall consist of—

(a) insulating material having properties not inferior to those of Class 80 moulding complying with AS/NZS 3112;or

(b) ceramic material of a type such that, after immersion in water for 48 h and after all visible drops of water have been removed from the surface by means of a clean dry cloth, it shall not have increased in mass by more than 2 percent.

In addition, all insulating portions, except ceramic, of a socket-outlet adaptor shall comply with the requirements of AS/NZS 3112 for ignitability and combustion propagation.

9 TERMINALS AND INTERNAL CONNECTIONS

9.1 Material

Terminals and internal connections intended primarily for carrying current shall be of suitable corrosion-resisting metal of sufficient hardness and rigidity for the intended application.

9.2 Construction of terminals

Terminals of a socket-outlet adaptor having facilities for the connection of a flexible cord shall be capable of accommodating the conductors of a flexible cord of current rating corresponding to the marked current rating of the socket-outlet adaptor.

Facilities shall be provided to prevent slipping or spreading of the conductor strands. Where the facilities are such that the conductor is to be located around the shank of the terminal screw and clamped under the screw head, the following requirements shall apply:

(a) When the terminal screw is screwed into the limit of its thread, the clearance between the head of the screw and the washer or means of retention of the conductor shall not exceed 0.4 mm.

(b) The terminal screw shall be of sufficient length to enable it to be backed off sufficiently from the washer or means of retention of the conductor so that the conductor may be located around the shank without difficulty.

(c) Where the means of retention of the conductor is not continuous, e.g. prongs, there shall be at least three points of retention and the maximum angle between any two points shall not exceed 150 degrees.

(d) Where the means of retention of the conductor is continuous, e.g. portion of the insulating moulding, the angle subtended by the arc of the means of retention shall be not less than 180 degrees.

When the socket-outlet adaptor is correctly assembled, the terminals shall be held firmly in position.

9.3 Polarity sequence

Where a socket-outlet adaptor has a 3-pin flat-pin plug portion, the internal connections shall be such that the contacts of the socket portions have a polarity sequence of earth, active, neutral, in a clockwise direction when viewed from the front of the socket.

Where a flexible cord is integrally moulded with a socket-outlet adaptor, the conductor with the light blue or black insulation shall be connected to the neutral connection of the socket-outlet adaptor, determined from the above polarity sequence for 3-pin flat-pin types.

10 PINS AND CONTACTS

10.1 Material

Pins and contacts shall be of suitable corrosion-resisting metal of sufficient rigidity and durability for the intended application.

10.2 Construction

Contacts of any socket portion shall make and maintain, under normal service conditions, satisfactory electrical and mechanical contact with the pins of the appropriate type of plug. For a socket-outlet intended to accommodate plugs with flat pins, contact shall be made with both sides of each pin.

The alignment and contact-making properties of contacts shall be independent of terminal screws.

The effectiveness of the contacts shall be independent of pressure from any thermoplastic or resilient moulding.

In a socket-outlet designed for use with flat-pin plugs complying with AS/NZS 3112, the contacts shall be self-adjusting in pitch and contact making.

10.3 Entry or withdrawal of plug pins into a socket-outlet

Within the socket-outlet there shall be provision for effective guidance of the appropriate corresponding plug pins to ensure direct entry and withdrawal without critical distortion of the socket-outlet contacts.

Compliance shall be checked by visual inspection and, if necessary, by manual or electrical test.

10.4 Assembly of pins

If, during assembly, pins can become readily detached from the plug portion while remaining attached to the conductors of a flexible cord, or have to be detached from the plug portion in order that connection can be effected, it shall not be possible for the socket-outlet adaptor to be assembled with any pin located in a position other than that intended to be occupied.

In a socket-outlet adaptor made of resilient insulating material, the pins, contacts and terminals shall be held securely in position.

11 EXPOSED METAL

A socket-outlet adaptor shall have no exposed metal parts when inserted in an appropriate socket-outlet.

12 MEANS OF ENTRY AND CORD ANCHORAGE FOR FLEXIBLE CORD

12.1 General

A socket-outlet adaptor having facilities for the connection of a flexible cord shall be provided with a single aperture for the entry of the flexible cord together with any protective covering, and for effective anchorage of any flexible cord which the socket-outlet adaptor is intended to accommodate such that any stress on the terminals will be substantially reduced. For rewirable socket-outlet adaptors, the anchorage shall be effective for the range of flexible cords listed in Table 1 except where—

(a) there is a special aperture for accommodation of only one type or size of flexible cord, a circular hole not being regarded as restricting entry of cords having diameters smaller than that of the hole; or

(b) a socket-outlet adaptor is marked with the sizes and types of flexible cords with which the manufacturer specifies that it is intended to be used.

TABLE 1

RANGE OF FLEXIBLE CORDS

Plug rating A	Flexible cord	
	Size mm^2	Type
≤7.5	0.5 up to 0.75	Appropriate to design of socket-outlet adaptor
>7.5 ≤10	0.75, 1.0	Light duty Ordinary duty Heavy duty
>10	Maximum size appropriate to design of plug and next smallest size	Ordinary duty or heavy duty as appropriate

12.2 Anchorage

The cord anchorage shall be in accordance with AS/NZS 3100. In addition, except where the socket-outlet adaptor is specially designed to accept only parallel 2-core unsheathed flexible cord, the following shall apply to rewirable resilient and thermoplastic socket-outlet adaptors having a plug portion of the three-pin, flat-pin type in accordance with AS/NZS 3112:

Two means of cord grip shall be provided, the first being anchorage of each insulated core by a pillar, post, grip, tortuous path or equally effective means, and the second being gripping or clamping the sheathing of the flexible cord. Both means may be incorporated in one device.

12.3 Side-entry (of the flexible cord) socket-outlet adaptors

In addition to complying with the requirements of Clauses 12.1 and 12.2, side-entry socket-outlet adaptors shall comply with the requirements for side entry plugs of AS/NZS 3112.

13 NON-REWIRABLE SOCKET-OUTLET ADAPTORS

A non-rewirable socket-outlet adaptor incorporating a flexible cord shall be designed to comply with the following requirements:

(a) Each conductor shall be rigidly and effectively attached to the appropriate pin. Each pin, the conductor attached to it and the insulation on the conductor adjacent to the connection, shall be adequately supported and secured in position in the plug.

(b) The conductors shall be attached to the pins by clamping, crimping, welding or soldering. Soldered connections shall comply with AS/NZS 3100 and soldering may be used only to supplement a clamped or crimped connection unless the design of the plug is such that the soldered connection will not be subjected to flexure during normal use of the adaptor.

(c) The flexible cord, complete with any braid, cover or sheath, shall be taken into the body of the adaptor and the complete flexible cord shall be securely held in position in the adaptor by the moulding, encapsulation, cover or other suitable means which will effectively prevent any part of the flexible cord from moving out of the adaptor during normal use.

(d) The plug pins shall be adequately proportioned throughout and the portion adjacent to the connection shall be designed so as not to introduce a stress concentration which may lead to fracture of the pin, and shall be suitably shaped to prevent abrasion or cutting of conductor strands due to flexure in normal use.

(e) The moulding or encapsulating material shall be of even texture throughout and of suitable proportions to ensure adequate physical properties. It shall be free of voids which may lessen significantly the mechanical strength or electrical properties of the adaptor.

14 RATING

The marked rating of a socket-outlet adaptor having a flat-pin plug portion complying with AS/NZS 3112 shall not exceed 250 V, 10 A, or 250 V, 15 A, as appropriate.

15 INTERNAL CONNECTIONS

The design and construction of a socket-outlet adaptor provided with earthing connections shall be such that when the socket-outlet adaptor is correctly wired and completely assembled—

(a) a loose terminal screw or conductive material cannot bridge any live parts or earthing parts;

(b) the earthing parts are effectively isolated from contact with a live conductor which may become detached; and

(c) the live parts are effectively isolated from contact with any earthing conductor which may become detached.

16 ARRANGEMENT OF EARTHING CONNECTION

The design and construction of a socket-outlet adaptor provided with an earthing connection shall be such that, during normal insertion of a plug into the socket portion or the plug portion into a socket-outlet, the earthing connection is made before the connection of live pins, and during normal withdrawal the earthing connection is broken after disconnection of the live pins.

The earthing pin aperture and contact of any low voltage socket-outlet which is intended to accommodate a 3-pin flat-pin plug shall be that aperture and contact which is radial to the circle embracing the pins (see AS/NZS 3112).

17 PREVENTION OF CONTACT WITH LIVE PINS

17.1 During insertion

Socket-outlet adaptors shall comply with the requirements of AS/NZS 3112 for socket-outlets, for the prevention of contact with live pins of any appropriate plug with which the adaptor is intended to be used during insertion of the plug into a socket-outlet.

17.2 Assembly and alignment of covers

The design and construction of a socket-outlet adaptor shall be such that it is not possible to assemble the socket-outlet adaptor incorrectly, and that the plug pin apertures in the cover of a socket-outlet shall always be aligned with the appropriate contacts of the socket-outlet.

18 CLEARANCES

The general arrangement and clearance between conductive parts shall be such that the socket-outlet adaptor complies with the current-breaking test of AS/NZS 3112.

19 SWITCHES

Any switch incorporated in a socket-outlet adaptor shall be a Category 1 switch, however, the 'off' position need not be marked.

20 RADIO INTERFERENCE SUPPRESSION DEVICES

Where a device is incorporated in a socket-outlet adaptor for the suppression of radio interference, it shall comply with IEC 60384-14.

21 MARKING

21.1 Required marking

Every socket-outlet adaptor shall be marked with the following information in accordance with AS/NZS 3100:

(a) The name or registered trade name or mark of the manufacturer or of the responsible vendor.

(b) The words 'Total Loading' followed by the current rating, in amperes.

(c) The voltage.

(d) If limited by any component to use on alternating current or direct current, the socket-outlet adaptor shall be marked 'a.c.' or 'd.c.', as appropriate.

(e) If not the only type of socket-outlet adaptor marketed by the manufacturer or by the responsible vendor, it shall also be marked with a catalogue number, type number or name, or other marking which will distinguish it from any other type of socket-outlet adaptor marketed by that manufacturer or responsible vendor.

NOTE: Manufacturers making a statement of compliance with this Joint Australian/New Zealand Standard on a product, packaging, or promotional material related to that product are advised to ensure that such compliance is capable of being verified.

(f) The type of plug and socket-outlet, if other than an AS/NZS 3112, Figure 2.1 type with which the adaptor is intended to be used.

NOTE: The marking required by Item (f) may be included in the manufacturer's instructions.

21.2 Location of marking

The marking of Items (b), (c) and (d) of Clause 21.1 shall be placed on the external body of the socket-outlet adaptor.

The marking required under Items (a) and (e) of Clause 21.1 may be made on any portion of the socket-outlet adaptor.

21.3 Additional requirements for rewirable socket-outlet adaptors

A rewirable socket-outlet adaptor having facilities for the connection of a flexible cord shall also be supplied with instructions detailing the following:

(a) A diagram illustrating the method of connection of the conductors and in particular the earthing conductor and the cord anchorage. This diagram shall show the earthing conductor printed in green/yellow colours. The live conductors shall not be coloured.

(b) A full-scale diagram showing the length of sleeving and insulation to be stripped back.

(c) A description of the method of connection of each conductor giving the alternative colours permissible for the active, neutral and earthing conductors, respectively.

(d) The size and types of flexible cords with which it is intended to be used.

(e) A diagram, either in or on accompanying packaging, depicting both the correct and incorrect method of connection, and the correct and incorrect applications of a socket-outlet adaptor.

NOTES:

1 As specified in AS/NZS 3199, only a three-pin flat-pin plug conforming to AS/NZS 3112 and a cord extension socket complying with AS/NZS 3120 are to be used for a cord extension set.

2 Socket-outlet adaptors intended to be marketed in bulk, e.g. to equipment manufacturers, may be supplied with one set of instructions per package.

21.4 Earthing connections

Where a rewirable socket-outlet adaptor incorporates a contact intended to provide an earthing facility, its terminal shall be distinguished by marking in accordance with AS/NZS 3100 located either on, or adjacent to, the earthing terminal.

This marking shall be supplemented by the conspicuous application of a green colour on or adjacent to the earth terminal, if the socket-outlet adaptor is of the rewirable type.

If, during assembly, pins or contacts can become readily detached from the body of the socket-outlet adaptor while remaining attached to the conductors of the flexible cord, or are required to be detached from the body in order that connection may be effected, the above information shall be conspicuously marked inside the body adjacent to the position for the earthing pin or contact and on the pin or contact.

21.5 Live connections

21.5.1 *General*

The live connections of rewirable socket-outlet adaptors shall be marked as required by AS/NZS 3100, except that the active connection of flat pin plugs shall be indicated by the letter 'A'.

21.5.2 *Location of marking*

The marking shall be on the body of the socket-outlet adaptor, adjacent to the terminals if pins can become readily detached from the body or are required to be detached so that connection to the terminals may be effected.

In other cases, the marking may be on the terminals.

21.6 Configuration of socket-outlet adaptor fitted with flat-pins

Where a socket-outlet adaptor conforming to Figure 2.1(a) or (c), of AS/NZS 3112 is fitted with flat pins, the pins shall be disposed so that, when the pins are correctly connected, the pin configuration, viewed from the pins, shall be earth, neutral, active in a clockwise direction.

22 COMPLIANCE WITH TESTS IN AS/NZS 3112

A socket-outlet adaptor shall satisfy all the tests specified in AS/NZS 3112, which are relevant to its type of construction. Where applicable, the tests shall be applied to the plug portion and socket portions independently.

The additional tests for non-rewirable plug and cord sets of AS/NZS 3112 shall be applied to socket-outlet adaptors which are of non-rewirable construction with a flexible cord.

APPENDIX A

TRAVEL ADAPTORS

(Normative)

A1 SCOPE

This appendix sets out requirements for travel adaptors that supplement all other requirements of this Standard.

A2 DEFINITION

Travel adaptor—a portable accessory constructed as an integral unit or has several parts that have pins that fit into a socket-outlet complying with AS/NZS 3112 or has a socket-outlet that will accept pins of a plug complying with AS/NZS 3112.

A3 SOCKET PORTION

A socket-outlet portion that will only accept a plug complying with AS/NZS 3112 shall comply with the relevant requirements of AS/NZS 3112.

Other socket-outlet portions shall comply with the relevant requirements of AS/NZS 3112 except that the 'Maximum Dimension of Pin Entry Apertures' need not be applied.

A4 PLUG PORTION

A plug portion that will fit into a socket-outlet complying with AS/NZS 3112 shall comply with the relevant requirements of AS/NZS 3112.

A5 PROTECTION AGAINST LIVE PARTS

The adaptor shall be constructed so that when the adaptor is standing, supported, or fixed, in a normal manner no person can inadvertently come into contact with any live parts in accordance with AS/NZS 3100.

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