

Australian/New Zealand Standard[®]

**Approval and test specification—
General requirements for household
and similar electrical appliances**

[Based on IEC 335-1:1976, Safety of household and similar electrical appliances—General requirements]

AS 3300—1996/NZS 6300:1996

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL/2, Electrical Approvals Standards. It was approved on behalf of the Council of Standards Australia on 20 December 1995 and on behalf of the Council of Standards New Zealand on 4 March 1996. It was published on 5 April 1996.

The following interests are represented on Committee EL/2:

Association of New Zealand Electrical Appliance Distributors
Australian Chamber of Commerce and Industry
Australian Electrical and Electronic Manufacturers Association
Consumer Electronics Suppliers Association, Australia
Electrical regulatory authorities
Electricity Supply Association of Australia
Electrical test laboratories
Institution of Engineers, Australia
Metal Trades Industry Association of Australia
Ministry of Commerce, New Zealand
New Zealand Manufacturers Federation

Review of Standards. To keep abreast of progress in industry, Joint Australian/New Zealand Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all Joint Standards and related publications will be found in the Standards Australia and Standards New Zealand Catalogue of Publications; this information is supplemented each month by the magazines 'The Australian Standard' and 'Standards New Zealand', which subscribing members receive, and which give details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Joint Standards, addressed to the head office of either Standards Australia or Standards New Zealand, are welcomed. Notification of any inaccuracy or ambiguity found in a Joint Australian/New Zealand Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

Originated in Australia as AS 3300—1978.
Originated in New Zealand as NZS 6300:1980.
Final Australian edition 1992.
Final New Zealand edition 1992.
Jointly revised and designated AS 3300—1996/NZS 6300:1996.

Incorporating:
Amdt 1—1997
Amdt 2—1998
Amdt 3—1998

© Copyright — STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Users of Standards are reminded that copyright subsists in all Standards Australia and Standards New Zealand publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia or Standards New Zealand may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia or Standards New Zealand. Permission may be conditional on an appropriate royalty payment. Australian requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia. New Zealand requests should be directed to Standards New Zealand.

Up to 10 percent of the technical content pages of a Standard may be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia or Standards New Zealand.

Inclusion of copyright material in computer software programs is also permitted without royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia or Standards New Zealand at any time.

AS 3300—1996/NZS 6300:1996

Australian/New Zealand Standard®

**Approval and test specification—
General requirements for household
and similar electrical appliances**

PUBLISHED JOINTLY BY:

STANDARDS AUSTRALIA
1 The Crescent,
Homebush NSW 2140 Australia

STANDARDS NEW ZEALAND
Level 10, Radio New Zealand House,
155 The Terrace,
Wellington 6001 New Zealand

ISBN 0 7337 0328 3

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL/2 on Electrical Approvals Standards to supersede AS 3300—1992/NZS 6300:1992. It was prepared to align Australian Approval and Test Specifications and New Zealand Standards progressively with International Electrotechnical Commission (IEC) Standards for appliances.

This Standard is based on but is not equivalent to IEC 335-1:1976, *Safety of household and similar electrical appliances—General requirements*, including Amendments 1 to 6. It contains requirements of a general nature which form the basis of a series of supplementary Approval and Test Specifications that contain particular requirements for various types of household and similar electrical appliances. This Standard is being retained in parallel with AS/NZS 3350.1:1994, *Approval and test specifications—Safety of household and similar electrical appliances—General requirements*. It is required to support all the Parts 2 that still refer to it.

A number of variations have been made in this Standard to the text of IEC 335-1:1976. The variations are necessary to take into account the national requirements for electrical appliances that apply in both Australia and New Zealand. These variations are indicated, throughout the text of this Standard, by marginal bars located against the changed text or figure. The majority of variations are technical. Other variations to notes, explanatory matter, figures and references to Australian and New Zealand Standards and Specifications are also included for completeness.

Descriptions of these variations are to be found in Annex A to this Standard, given in the order found within the body of this Standard. These variations also form the Australian national variations for purposes of the IEC scheme for recognition of results of testing to Standards for safety of electrical equipment (the CB scheme).

The numbering of clauses and figures closely follow those of IEC 335-1:1976. To allow for the introduction of additional material by the IEC, the numbers 1 to 100 have been reserved. Clauses numbered from 101 are used by the IEC to add to the body of the Standard by the appendices. To allow for additional material to be introduced by Australia or New Zealand, the numbers 201 to 300 are used. 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. Where Australia or New Zealand has added a requirement or made a change to a particular clause of IEC 335-1, that clause number remains unchanged.

Where the word 'VOID' is used it means that the requirement in IEC 335-1:1976 is not applicable in Australia or New Zealand. The word is also used where the deletion of a requirement would lead to consequential renumbering of references within the body of this Standard.

In this Standard the requirements appear in roman type, notes and explanatory matter appear in smaller roman type and tests appear in italics.

It is not intended that this Standard be used where there is no particular standard for an appliance. It may, however, be used for guidance in the assessment of an appliance by reference to an existing particular standard for a similar type of appliance.

In Australia this Standard supersedes AS 3300—1992 on publication. In New Zealand this Standard supersedes NZS 6300:1992 on publication.

This Standard incorporates Amendment Nos 1, 2, 3 and 4 to the 1992 edition and contains changes which more closely align it with IEC 335-1:1976.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix or annexes to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

This Standard requires reference to the following:

NOTE: Where no relevant New Zealand Standard is listed, the referenced Australian Standard is deemed to be appropriate for the purpose of this Standard.

STANDARDS

AS 1125	Conductors in insulated electric cables and flexible cords
AS 1541	Fixed capacitors for use in electronic equipment
AS 1541.14	Part 14: Fixed capacitors for radio interference suppression
AS 1931	High voltage testing techniques
AS 1931.1	Part 1: General definitions, test requirements, test procedures and measuring devices
AS 1931.2	Part 2: Application guide for measuring devices
AS 1939	Degrees of protection provided by enclosures for electrical equipment (IP Code)
AS 2420	Fire test methods for solid insulating materials and non-metallic enclosures used in electrical equipment.
AS 2768	Electrical insulating materials—Evaluation and classification based on thermal endurance.
IEC 127	Miniature fuses
IEC 127-3	Part 3: Sub-miniature fuse-links
IEC 335	Safety of household and similar electrical appliances
IEC 335-1	Part 1: General requirements

NOTE: AS 3300/NZS 6300 is based on this Standard.

CISPR	International Special Committee on Radio Interference
BS 5267	Specification. Capacitors for single-phase a.c. motors
UL 94	Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

APPROVAL AND TEST SPECIFICATIONS

AS 3109	Appliance couplers for household and similar general purposes
AS 3109.1	Part 1: General requirements
AS/NZS 3112	Plugs and socket-outlets
AS 3116	Electric cables—Elastomer insulated—For working voltages up to and including 0.6/1 kV
AS 3133 (NZS/AS 3133)	Air break switches
AS 3147 (NZS/AS 3147)	Electric cables—Thermoplastic insulated for working voltages up to and including 0.6/1 kV
AS 3161 (NZS/AS 3161)	Thermostats and energy regulators
AS 3191 (NZS/AS 3191)	Electric flexible cords
AS/NZS 3200	Medical electrical equipment
AS/NZS 3250	Mains operated electronic and related equipment for household and similar general use
AS 3301/NZS 6325	Particular requirements for microwave ovens

CONTENTS

	<i>Page</i>
1 SCOPE AND APPLICATION	11
1.1 INTERFERENCE SUPPRESSION	11
2 DEFINITIONS	12
2.1 GENERAL	12
2.2 SPECIFIC DEFINITIONS	12
3 GENERAL REQUIREMENTS	18
3.1 DESIGN AND CONSTRUCTION	18
3.201 COMPLIANCE WITH ALTERNATIVE REQUIREMENTS	18
3.202 DIRECT CURRENT COMPONENT FROM ALTERNATING CURRENT APPLIANCES	18
4 GENERAL NOTES ON TESTS	19
4.1 TYPE OF TESTS	19
4.2 SAMPLING	19
4.3 ORDER OF TESTS	19
4.4 POSITION DURING TESTS	19
4.5 TEMPERATURE	19
4.6 VOLTAGE	19
4.7 APPLIANCES WITH ALTERNATIVE HEATING ELEMENTS OR ACCESSORIES	20
4.8 APPLIANCES WITH HEATING ELEMENTS AND MOTORS	20
4.9 APPLIANCES WITH VARIABLE SETTING DEVICES	20
4.10 APPLIANCES FOR BUILDING-IN	20
4.11 APPLIANCES SUPPLIED BY FLEXIBLE CABLE OR CORD	20
4.12 VARIATION OF RATING WITH TEMPERATURE	20
4.13 NORMAL LOAD	20
4.14 CLASS III APPLIANCES	21
4.15 EARTHING OF ACCESSIBLE METAL PARTS	21
4.16 UNEARTHED ACCESSIBLE METAL IN CLASS I APPLIANCES	21
4.17 APPLIANCES OPERATING AT SAFETY EXTRA-LOW VOLTAGE	21
4.18 SPECIAL APPLIANCES	21
5 RATING	21
5.1 MAXIMUM RATED VOLTAGE	21
6 CLASSIFICATION	21
6.1 GENERAL	21
7 MARKING	21
7.1 GENERAL	21
7.2 APPLIANCES FOR SHORT-TIME OR INTERMITTENT OPERATION	22
7.3 DETACHABLE HEATING ELEMENTS	22

	<i>Page</i>
7.4 APPLIANCES WITH ADJUSTABLE VOLTAGE OR INPUT RATINGS	23
7.5 APPLIANCES OR DETACHABLE HEATING ELEMENTS WITH MULTIPLE VOLTAGE RATINGS OR RANGES	23
7.6 SYMBOLS	23
7.7 TERMINALS	24
7.8 CONNECTION DIAGRAM	24
7.9 CONTROL SWITCHES	24
7.10 POSITION OF REGULATING DEVICES AND SWITCHES	24
7.11 ADJUSTABLE DEVICES	24
7.12 INSTRUCTIONS FOR INSTALLATION AND USE	25
7.13 INSTRUCTION SHEETS	25
7.14 LEGIBILITY AND DURABILITY	25
 8 PROTECTION AGAINST ELECTRIC SHOCK	 26
8.1 CONSTRUCTION AND ENCLOSURE	26
8.2 APPLIANCES USED IN CONTACT WITH SKIN OR HAIR	28
8.3 APPLIANCES WITH FLEXIBLE SHAFTS	28
8.4 CONDUCTING LIQUIDS	28
8.5 SHAFTS OF KNOBS, HANDLES, LEVERS AND THE LIKE	28
8.6 HANDLES, KNOBS, AND LEVERS HELD OR ACTUATED IN NORMAL USE	28
8.7 HANDLES CONTINUOUSLY HELD IN NORMAL USE	28
8.8 CAPACITORS	29
8.9 APPLIANCES CONNECTED TO SUPPLY BY A PLUG	29
 9 STARTING OF MOTOR-OPERATED APPLIANCES	 29
9.1 GENERAL	29
9.2 VOID	29
9.3 OVERLOAD PROTECTION DEVICES	29
 10 INPUT AND CURRENT	 29
10.1 RATED INPUT	29
10.2 MOTOR-OPERATED APPLIANCES	30
10.3 HEATING APPLIANCES OR DETACHABLE HEATING ELEMENTS	30
 11 HEATING	 30
11.1 NORMAL USE	30
11.2 LOCATION OR POSITION DURING TESTS	34
11.3 DETERMINATION OF TEMPERATURE	35
11.4 OPERATION OF HEATING APPLIANCES DURING TESTS	35
11.5 OPERATION OF MOTOR-OPERATED APPLIANCES DURING TESTS . . .	35
11.6 OPERATION OF COMBINED APPLIANCES DURING TESTS	35
11.7 OPERATION TIME	36
11.8 LIMITS OF TEMPERATURE RISE	36
11.9 APPLIANCES WITH CORD STORAGE DEVICES	36
11.10 ACCELERATED AGEING TESTS ON INSULATING SYSTEMS OF MOTOR WINDINGS	36

12	OPERATION UNDER OVERLOAD CONDITIONS OF APPLIANCES WITH HEATING ELEMENTS	37
12.1	NORMAL USE	37
12.2	TEST	37
12.3	ADDITIONAL TEST	38
13	ELECTRICAL INSULATION AND LEAKAGE CURRENT AT OPERATING TEMPERATURE	38
13.1	NORMAL USE	38
13.2	LEAKAGE CURRENT TEST	38
13.3	ELECTRIC STRENGTH TEST	40
14	RADIO AND TELEVISION INTERFERENCE SUPPRESSION	41
14.1	GENERAL	41
15	MOISTURE RESISTANCE	41
15.1	ENCLOSURES	41
15.2	TESTS OF ENCLOSURES	41
15.3	EFFECT OF SPILLAGE	42
15.4	EFFECT OF HUMIDITY	42
16	INSULATION RESISTANCE AND ELECTRICAL STRENGTH	43
16.1	GENERAL	43
16.2	LEAKAGE CURRENT TEST	43
16.3	INSULATION RESISTANCE TEST	44
16.4	ELECTRIC STRENGTH TEST	45
17	OVERLOAD PROTECTION	45
17.1	APPLIANCES INCORPORATING CIRCUITS SUPPLIED FROM TRANSFORMERS	45
18	ENDURANCE	46
18.1	GENERAL	46
18.2	OPERATING TIME	47
18.3	STARTING	47
18.4	APPLIANCES PROVIDED WITH AUTOMATIC STARTING	47
18.5	APPLIANCES WITH SELF-RESETTING THERMAL CUTOUTS	47
18.6	TEST RESULTS	48
19	ABNORMAL OPERATION	48
19.1	GENERAL	48
19.2	REDUCED VOLTAGE TEST	49
19.3	INCREASED VOLTAGE TEST 1	49
19.4	INCREASED VOLTAGE TEST 2	49
19.5	INCREASED VOLTAGE TEST 3	49
19.6	STALLED-MOTOR TEST	49
19.7	APPLIANCES WITH THREE-PHASE MOTORS	51
19.8	RUNNING OVERLOAD TEST	51

19.9	APPLIANCES FOR SHORT-TIME OR INTERMITTENT OPERATION	51
19.10	APPLIANCES WITH SERIES MOTORS	51
19.11	TEST RESULTS	51
20	STABILITY AND MECHANICAL HAZARDS	52
20.1	STABILITY	52
20.2	MECHANICAL HAZARDS	53
21	MECHANICAL STRENGTH	53
21.1	GENERAL	53
21.2	SCREWED GLANDS AND CONDUIT ENTRIES	54
21.3	TEST FOR SCREWED GLANDS	54
21.4	TEST FOR CONDUIT ENTRY SHOULDERS	55
22	CONSTRUCTION	55
22.1	PROTECTION AGAINST ELECTRIC SHOCK	55
22.2	PROTECTION AGAINST MOISTURE	55
22.3	OPERATION IN NORMAL POSITIONS	55
22.4	PROTECTION AGAINST PENETRATION FROM BENEATH	55
22.5	APPLIANCES WITH ADJUSTABLE VOLTAGE SETTING	55
22.6	APPLIANCES WITH ADJUSTABLE THERMOSTATS	55
22.7	LOCATION OF BUTTONS OF NON-SELF-RESETTING CONTROLS	55
22.8	APPLIANCES WITH INTEGRAL PINS	56
22.9	APPLIANCES WHERE INTEGRAL PINS ARE PROHIBITED	56
22.10	REMOVAL OF PARTS NEEDED FOR MOISTURE PROTECTION	56
22.11	PROTECTION AGAINST WATER	56
22.12	FIXING OF HANDLES, KNOBS AND THE LIKE	56
22.13	FIXING OF COMPONENTS WHICH MAY REQUIRE REPLACEMENT ...	56
22.14	STORAGE HOOKS AND CORD REELS FOR FLEXIBLE CORDS	57
22.15	VOID	57
22.16	USE OF FIBROUS OR HYGROSCOPIC MATERIAL AS INSULATION ...	57
22.17	USE OF DRIVING BELTS FOR INSULATION	57
22.18	SEGREGATION OF SAFETY EXTRA-LOW VOLTAGE PARTS AND OTHER LIVE PARTS	58
22.19	USE OF REINFORCED INSULATION	58
22.20	REMOVAL AND REPLACEMENT OF INSULATION	58
22.21	USE OF FLEXIBLE CORD SHEATH AS SUPPLEMENTARY INSULATION INSIDE AN APPLIANCE	58
22.22	CREEPAGE AND CLEARANCE DISTANCES OF CLASS II APPLIANCES	58
22.23	SUPPLEMENTARY AND REINFORCED INSULATION	59
22.24	DIRECT CONTACT BETWEEN LIVE PARTS AND THERMAL INSULATION	59
22.25	CONSTRUCTION OF HANDLES	59

	<i>Page</i>
22.26 BARE HEATING ELEMENTS	60
22.27 SAGGING OF HEATING CONDUCTORS	60
22.28 SAFEGUARDS AGAINST EXCESSIVE PRESSURE	60
22.29 FIXING OF SPACERS	60
22.30 CORROSION	60
22.31 APPLIANCES CONNECTED TO GAS OR WATER PIPES AND APPLIANCES INTENDED TO BE PERMANENTLY CONNECTED	60
22.32 APPLIANCES HAVING COMPARTMENTS LIABLE TO BE CLEANED IN NORMAL USE	61
22.33 PROTECTION OF INTERNAL PARTS AGAINST OIL, GREASE AND THE LIKE	61
22.34 BRUSHES, BRUSH-HOLDERS AND BRUSH-CAPS	61
22.35 VOID	61
22.36 USE OF ASBESTOS	61
23 INTERNAL WIRING	61
23.1 MECHANICAL PROTECTION	61
23.2 PROTECTION AND ENCLOSURES	61
23.3 USE OF BEADS AND SIMILAR CERAMIC INSULATORS	61
23.4 WIRING WHICH CAN MOVE	62
23.5 MAINTENANCE OF CREEPAGE DISTANCES AND CLEARANCE	62
23.6 IDENTIFICATION OF WIRING	62
23.7 USE OF D-TYPE FUSE-BASES	63
23.8 USE OF ALUMINIUM CONDUCTORS	63
23.9 USE OF LEAD-TIN SOLDERING	63
24 COMPONENTS	63
24.1 GENERAL	63
24.2 PROHIBITED COMPONENTS	64
24.3 SWITCHES	64
24.4 SOCKETS	65
24.5 CONNECTING DEVICES USED FOR INTERMEDIATE CONNECTIONS	65
24.6 LAMPHOLDERS	65
24.7 SERIES RESISTORS OF GLOW-DISCHARGE LAMPS	65
24.8 THERMAL CUTOUTS	66
24.9 SWITCH REQUIRED FOR MOBILE MOTOR-OPERATED APPLIANCES ..	66
24.10 MERCURY SWITCHES	66
24.11 CLASS I APPLIANCES WITH HEATING ELEMENTS	66
24.201 ELECTRONIC REGULATING DEVICES AND SWITCHES	66
25 SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CABLES AND CORDS	66
25.1 MEANS OF CONNECTION	66
25.2 PROVISION OF CONNECTION FACILITY	66
25.3 APPLIANCE INLETS	67