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Australian Standard® 3104—1987

APPROVAL AND TEST SPECIFICATION— ELECTRIC PORTABLE IMMERSION HEATERS



**PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
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The following interests are represented on Committee EL/2:

Australian Consumers Association
Australian Electrical and Electronic Manufacturers Association
Confederation of Australian Industry
Consumer Electronics Suppliers Association
Electrical Apparatus Approvals Authorities
Electrical Supply Association of Australia
Electrical Testing Laboratories
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HISTORY BLOCK AS 3104

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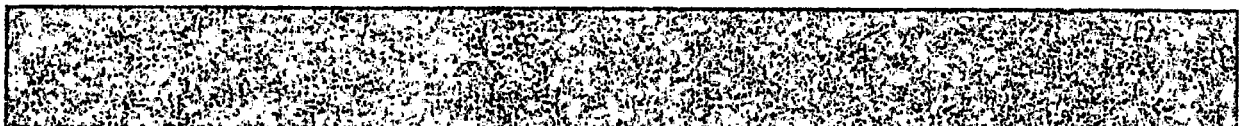
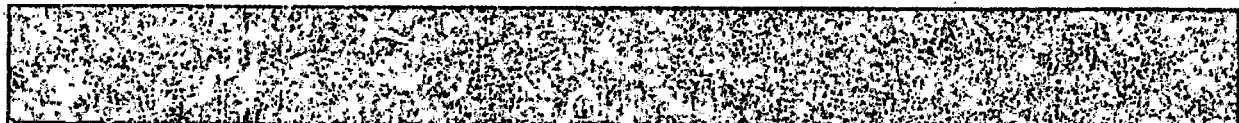
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PREFACE

This standard was prepared by Committee EL/2, Electrical Approvals Standards. It is one of a series of approval and test specifications issued by the Association. These specifications are accompanied by a general specification AS 3100, containing definitions and general requirements for electrical materials and equipment. The purpose of these specifications is to outline conditions which must be met to secure approval for the sale and use of electrical equipment in Australia. Only safety matters and related conditions are covered.

This edition was published to incorporate into the specification Amendment No 1 to AS 3104—1982 and to effect a change to Clause 6 with regard to length of flexible cord. Also a list of reference documents has been added to Clause 1 and a note with regard to the StandardsMark added to Clause 11.

This specification supersedes AS 3104—1982 from date of publication.

The Association desires to call attention to the fact that this specification does not purport to include all the necessary provisions of a contract.

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30 MAR 1987

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

APPROVAL AND TEST SPECIFICATION—

ELECTRIC PORTABLE IMMERSION HEATERS

This specification shall be read in conjunction with AS 3100. (See also Clause 3, below.)

1 SCOPE AND REFERENCED DOCUMENTS.

1.1 Scope. This specification applies to electric portable immersion heaters, as defined below, which are intended for electrical operation by direct or alternating current at low or medium voltages.

It does not apply to electric jugs, kettles or other vessels/appliances to which heating units are permanently affixed, or to heating units intended for permanent fixing, in such vessels, or to aquarium immersion heaters, or to heaters specifically designed for industrial or commercial usage.

1.2 Referenced documents. The following approval and test specifications are referred to in this standard:

- AS 3100 Definitions and General Requirements for Electrical Materials and Equipment
- AS 3109 Appliance Couplers for Household and Similar General Purposes
- AS 3161 Thermostats and Energy Regulators
- AS 3191 Electric Flexible Cords.

2 DEFINITIONS. For the purpose of this specification a portable immersion heater (hereinafter referred to as an 'immersion heater') is a portable electrical appliance designed for connection by means of a flexible cord and intended for heating liquid in which it may be immersed.

3 COMPLIANCE WITH SPECIFICATIONS.

3.1 General requirements of AS 3100. This specification shall be read in conjunction with AS 3100, and the appropriate provisions of AS 3100 shall apply to the construction of the immersion heater and the insulation and/or safeguarding of parts which normally carry current.

3.2 Specific requirements of this specification. An immersion heater shall be deemed to comply with this specification only if it complies with all the requirements of this specification and passes the relevant tests specified herein.

3.3 Requirements of other specifications. Components incorporated in an immersion heater which are depended upon for safety shall comply with the appropriate requirements of any relevant approval and test specification unless such requirements are varied herein.

4 ENCLOSURE OF ELEMENTS. The element of the immersion heater shall be completely enclosed in a metal sheathing of such material and form as will ensure that, under normal operating conditions, liquid in which it is immersed will not gain access to the element or live parts.

The element shall be located centrally within the sheathing in such a manner as will prevent relative movement or contact between the element and the sheathing. Loose filling without spacers shall be deemed in sufficient protection against contact between the element and the casing.

A spacer, bushing or filling shall be provided at the point of egress of the element from the sheathing.

The outer sheathing shall be made from a corrosion-resistant alloy or, alternatively, be plated or otherwise treated in a manner which will prevent undue corrosion under normal conditions of use.

5 MEANS OF CONNECTION. The immersion heater shall be provided with one of the following means of connection to the supply:

- (a) A Type C appliance inlet complying with AS 3109. The socket shall be arranged so that the temperature of the inserted plug will not exceed the limiting temperatures specified in AS 3100 for the materials used, when the heater is operated under the conditions prescribed in Clause 13.4.
- (b) A power supply cord which shall be assembled with the appliance by one of the following methods:
 - Type X attachment.
 - Type M attachment.
 - Type Y attachment.
 - Type Z attachment.

6 FLEXIBLE CORD AND CONNECTING PLUG. Where required by Clause 4.4 of AS 3100, the immersion heater shall be provided with a supply flexible cord and connecting plug.

Any flexible cord provided with the immersion heater for the purpose of connecting it to the supply shall comply with AS 3191. In addition, it shall—

- (a) be of the unkinkable or light duty sheathed type for heaters rated at 1200 W or less, or of a type not inferior to an ordinary duty sheathed type for heaters rated in excess of 1200 W; and
- (b) be correctly wired in accordance with the appropriate requirements of Clause 4.4 of AS 3100.

7 IMMERSION HEATERS WITH EARTHING FACILITIES. All exposed metal (see Clause 2.21 of AS 3100) of an immersion heater shall be in effective electrical contact with an earthing terminal or contact and the arrangement shall be such as to comply with the test of earthing connection specified in Table 1.

The earthing terminal, if any, shall be marked in accordance with Clause 7.4 of AS 3100.