

Australian Standard™

Storage water heaters

Part 1: General requirements



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The following are represented on Committee EL-020:

Australian Consumers Association
Australian Electrical and Electronic Manufacturer's Association
Australian Gas Association
Confederation of Australian Industry
Electricity Supply Association of Australia
Engineering and Water Supply Department, S.A.
Heat Exchange Water Heater Manufacturers Association
Metal Trades Industry Association of Australia

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Part 1: General requirements

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PREFACE

This Standard was prepared by the Standards Australia Committee on Electric Water Heating Appliances to supersede the 1985 edition (thrice amended), to remove outdated references, to recognize changes to referenced Standards and Codes, to introduce requirements for the location of the boosting unit thermostat (see Clause 3.1.5.2), to amend the requirements for thermostat setting (see Clause 3.2.2), and to make it clear that safety valves are not lagged during testing (see Appendices B and C).

This Standard incorporates Amendment No. 1 (July 1992), Amendment No. 2 (December 1995), Amendment No. 3 (August 1996), Amendment No. 4 (January 2000) and Amendment No. 5 (September 2005). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

This Standard is one of a series covering storage water heaters as follows:

AS

- | | |
|--------|---|
| 1056 | Storage water heaters |
| 1056.1 | Part 1: General requirements (this Standard) |
| 1056.2 | Part 2: Specific requirements for water heaters with single shells |
| 1056.3 | Part 3: Specific requirements for water heaters with composite shells |
| 1056.4 | Part 4: Calculations of energy consumption |

A5

The amendment to this Standard includes key changes that will improve the accuracy of the existing methods of test for MEPS heat loss testing to acceptable levels.

AS/NZS 4692.1 sets out a new test method for MEPS heat loss testing.

This amended Standard will remain current until confidence and experience have been gained with AS/NZS 4692.1, after which time it will be superseded by AS/NZS 4692.1 and AS/NZS 4692.2.

The new regulatory Standard AS/NZS 4692.2 will allow testing to either the amended AS/NZS 1056.1 or AS/NZS 1361, as applicable, or to AS/NZS 4692.1. MEPS levels, as defined under each test method, are provided in AS/NZS 4692.2. The key elements included in Amendment 5 are as follows:

- Energy correction at the thermostat cut-out.
- Shielding of the water heater from other objects under test that have a temperature difference of greater than 5 K.
- Mounting the water heater on a wooden platform when testing. A cement sheet is also an acceptable mounting.
- 24 h stabilization plus 48 h test period.
- Product specification to be supplied with the test report.
- Frequency of sampling for air and water temperature measurements to be reduced to an acceptable period (5 min or less).

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STANDARDS AUSTRALIA

Australian Standard
Storage water heaters

Part 1: General requirements

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for:

- (a) Storage water heaters heated solely by electricity (hereinafter called 'water heaters') having rated hot-water deliveries within the range 25 L to 630 L and having heating units of the tubular-sheathed immersion type or the bobbin type.
 NOTE: Where non-electric supplementary heating, e.g. from a solar collector or a slow combustion stove, is used, additional requirements may be necessary.
- (b) Gas storage water heaters by cross-reference to Code AG 102 published by The Australian Gas Association and the Australian Liquefied Petroleum Gas Association (see Clauses 1.3.2 and 1.5.2).

This Standard does not apply to heat-exchange water heaters (see AS 1361).

NOTES:

- 1 Water heaters having deliveries in excess of 630 L generally have special requirements. Intending purchasers of such water heaters are advised to include in their specification such requirements of this Standard as are relevant to their needs.
- 2 For the installation of household type hot-water systems, see AS 3500.4.
- 3 Information to be supplied with enquiries and orders for electric water heaters is given in Appendix A.

1.2 APPLICATION

Electric water heaters shall comply with the relevant requirements of this Standard and with the requirements of the following Standards, as applicable:

- (a) Water heaters with single shells AS 1056.2.
- (b) Water heaters with composite shells AS 1056.3.

NOTE: A number of electricity supply authorities specify compliance with various performance and construction requirements of this Standard in order that the water heater be eligible for supply under certain tariffs.

1.3 REFERENCED DOCUMENTS**1.3.1 Standards**

The following Standards are referred to in this Standard:

AS

1056	Storage water heaters
1056.2	Part 2: Specific requirements for water heaters with single shells
1056.3	Part 3: Specific requirements for water heaters with composite shells

AS

1308	Electric water heaters—Thermostats and thermal cutouts
1357	Water valves for use with unvented water heaters
1357.1	Part 1: Protection valves
1357.2	Part 2: Control valves
1361	Automatic electric heat exchange water heaters
1432	Copper tubes for plumbing, gasfitting and drainage applications
1566	Copper and copper alloys—Rolled flat products
1722	Pipe threads of Whitworth form
1722.1	Part 1: Sealing pipe threads
1722.2	Part 2: Fastening pipe threads
1939	Degrees of protection provided by enclosures for electrical equipment (IP Code)
A1, A2 2345	Dezincification resistance of copper alloys
3142	Approval and Test Specification—Electric water heaters
3161	Approval and Test Specification for thermostats and energy regulators
A2 3498	Authorization requirements for plumbing products—Water heaters and hot-water storage tanks
3500	National Plumbing and Drainage Code
3500.4	Part 4: Hot water supply systems
A1, A2 3688	Water supply—Copper and copper alloy compression and capillary fittings and threaded end connectors

Not Applicable**1.3.2 Industrial code**

The following Code is referred to in this Standard:

AG

AG 102 Approval requirements for gas water heaters (published by The Australian Gas Association and the Australian Liquefied Petroleum Gas Association)

1.4 DEFINITIONS

For the purpose of this Standard, the following definitions apply (see also Figure 1.1).

1.4.1 Electric storage water heater (hereinafter referred to as a ‘water heater’)

A water heater which incorporates a thermally insulated water storage container in which the water is electrically heated and its temperature automatically controlled.

1.4.2 Unvented water heater

A water heater in which no provision is made for a vent permanently open to the atmosphere.

1.4.3 Vented water heater

A water heater in which provision is made for a vent permanently open to the atmosphere.

1.4.4 Displacement water heater

A water heater in which water is fed into the container at or near the bottom, displacing the hot water as it is drawn off from or near the top.

1.4.4.1 Mains-pressure water heater

A displacement water heater which is unvented and intended to be connected directly to the water supply so that hot water is available at the supply pressure.

1.4.4.2 Cistern-fed water heater

A displacement water heater which is supplied with water from a separately mounted feed tank in which the level of the water is automatically maintained.

1.4.4.3 Tank-attached water heater

A displacement water heater with no free water surface and in which the inlet water is supplied from an attached feed tank.

1.4.4.4 Side-fed water heater

A displacement water heater with a free water surface in which the inlet water is supplied from a feed tank attached to the side of the heater, and the hot water is drawn off at an outlet located below the free water surface.

1.4.4.5 Free-outlet water heater

A displacement water heater with an open outlet from which hot water is discharged by displacement, the flow of water being controlled by means of a valve or tap in the inlet water feed pipe.

1.4.5 Falling-level water heater

A non-displacement water heater with a free water surface from which hot water is drawn off at or near the bottom, the level of the water falling as the hot water is drawn off.

1.4.6 Hot-water delivery

The quantity of hot water that can be drawn off continuously at a specified flow rate and temperature drop.

1.4.7 Maximum water-supply pressure

The maximum pressure of the water supply to which a water heater (including reduction valve, if fitted) may be connected.

1.4.8 Maximum head

The maximum working pressure to which a water heater may be subjected as measured at the lowest point of the water heater.

NOTE: The units of measurement for maximum working pressure are as follows:

- (a) For vented water heaters..... metres of water (mH₂O).
- (b) For unvented water heaters kilopascals (kPa).

1.4.9 Heating element

The actual electrical conducting medium which is heated by an electric current.

1.4.10 Heating unit

A heating element together with its insulation and supports and any immediate enclosure and gasket.

1.4.10.1 Main heating unit

A heating unit intended to heat the entire quantity of water within the water heater.

1.4.10.2 *Boosting unit*

A heating unit intended to supply additional heat to that supplied by the main heating unit.

1.4.10.3 *Non-simultaneous boosting unit*

A heating unit intended to supply additional heat to that supplied by the main heating unit, but connected so as to prevent it from being energized simultaneously with the main heating unit.

1.4.10.4 *Bobbin heating unit*

A heating unit in which the heating element is strung on insulating bobbins and intended for installation in an element tube in the container.

1.4.10.5 *Tubular-sheathed immersion heating unit*

A heating unit consisting of a mineral-insulated metal-sheathed (MIMS) element.

1.4.11 **Container**

The vessel, including fittings, in which the heated water is stored.

1.4.12 **Shell**

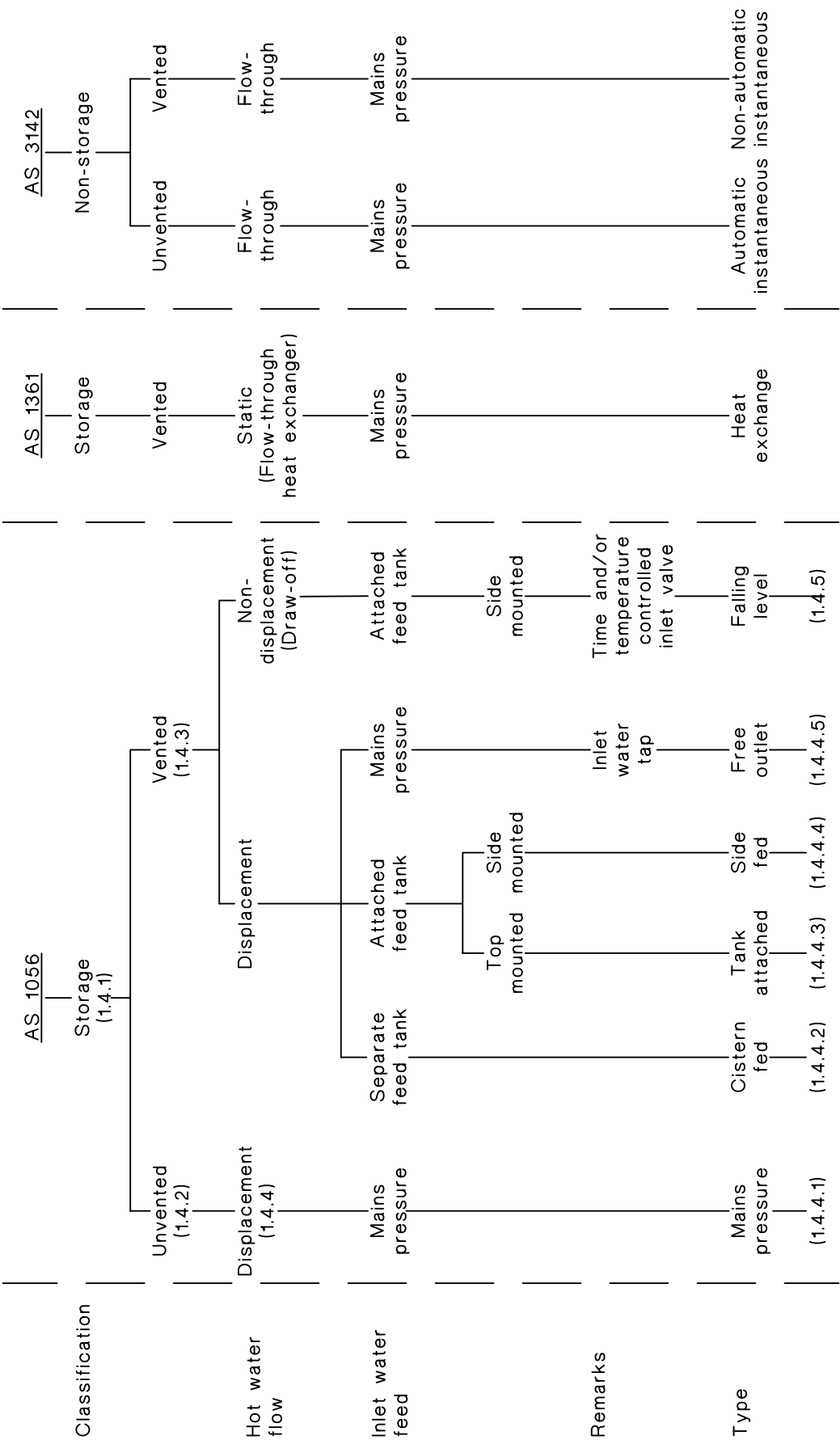
The container excluding all detachable fittings.

1.4.13 **Casing**

The jacket enclosing the container and its thermal insulation.

1.4.14 **Corset**

The brace and stays, or restraints, used to support the container, or the fittings of the container.



NOTE: The figures in brackets refer to the clause numbers of the definitions.

FIGURE 1.1 TYPES OF ELECTRIC WATER HEATERS

1.4.15 Bonded coating

A coating formulated to be resistant to continuous exposure to 1.4.15.1 Class X coating—a coating intended for applications where the water temperature does not exceed 70°C.

1.4.15.1 Class Y coating

A coating of lower solubility than Class X, intended to provide greater resistance to dissolution by water at temperatures up to 70°C or for use at temperatures in excess of 70°C.

1.5 COMPLIANCE WITH OTHER SPECIFICATIONS

1.5.1 Electrical safety requirements

In addition to complying with the requirements of this Standard, an electric water heater shall also comply with AS 3142.

1.5.2 Requirements for gas water heaters

A gas water heater shall comply with Code AG 102.

1.5.3 Requirements of water supply and other regulatory authorities

In addition to complying with the requirements of this Standard, a storage water heater shall comply with AS 3498 and with the regulations of the relevant authorities.

1.6 RATED HOT-WATER DELIVERY/CAPACITY

1.6.1 Electric water heaters

The rated hot-water delivery of an electric water heater, expressed in litres, shall be one of the following values:

25	31.5	40	50	63
80	100	125	160	200
250	315	400	500	630

When determined in accordance with Appendix C, the hot-water delivery shall not be less than the rated value.

1.6.2 Gas water heaters

The capacity of a gas water heater shall be in accordance with Code AG 102.

NOTE: A gas water heater is rated according to total water capacity, not hot-water delivery.

1.7 FACILITIES FOR MAINTENANCE

The design of a water heater shall be such as to facilitate maintenance.

Similar parts of water heaters of the same make, model, and size shall be interchangeable and, as far as is practicable, shall be manufactured and located so as to be capable of easy replacement without the necessity for individual fitting or adjustment.

Provision shall be made for heating units, thermostats, and thermal cut-outs to have adequate clearance from their housing so that they can be withdrawn easily when the water heater is fixed in accordance with the manufacturer's installation instructions. No heating unit shall interfere with any other heating unit during removal or replacement. Thermostats and thermal cut-outs shall be capable of being removed without the water being drained.

1.8 CLEANLINESS IN MANUFACTURE

None of the materials, including residual lubricants, solvents and fluxes, used in the fabrication of water heaters shall impart to the water traces of compounds in excess of those recommended by the World Health Organization *

* International Standards for Drinking-Water, WHO, Geneva (Australian Government Publishing Services, PO Box 84 Canberra, ACT 2600, or at sales offices in capital cities)

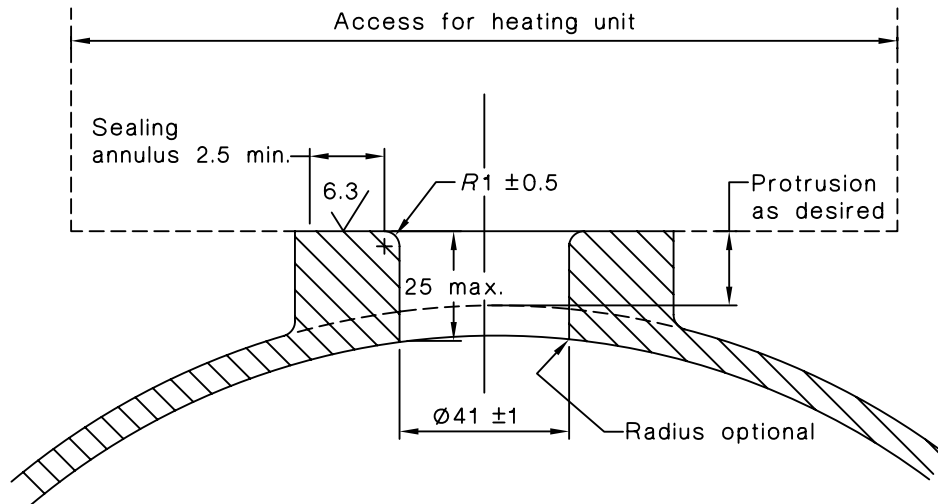
SECTION 2 CONSTRUCTION REQUIREMENTS

2.1 FIXING OF HEATING UNITS TO SHELL

Shells of electric water heaters shall provide facilities for fixing heating units as follows:

- (a) For tubular-sheathed immersion heating units (see Clause 3.1.2), an aperture and a sealing face shall be provided either in the form of a raised annular section (see Figure 2.1) or flush with the outer face of the aperture (see Figure 2.2). Means shall be provided to fix the heating unit flange (see Figure 3.1) to the shell.

A space shall be provided to facilitate insertion and removal of the heating unit. Only detachable thermostat assemblies and wiring may encroach within this space.



DIMENSIONS IN MILLIMETRES

FIGURE 2.1 APERTURE FOR TUBULAR-SHEATHED HEATING UNIT
(WITH PROTRUDING FITTING)