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1357.1—1988

WATER VALVES FOR USE WITH UNVENTED WATER HEATERS
Part 1—PROTECTION VALVES

AUSTRALIAN STANDARDS

AS 1357 Water supply—Valves for use with unvented water heaters
AS 1357.1—1992 Protection valves
(In Professional Packages 61A, 61B) 34pp *H*

Specifies requirements for the design, construction, testing and performance of temperature/pressure relief valves, expansion control valves and non-return valves specifically intended for use with unvented storage water heaters.

*Committee WS/21. **Supersedes AS 1357.1—1988: Publication date 1992-07-20: ISBN 0 7262 7530 1.***

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This Australian Standard was prepared by Committee WS/21/1, Water Fittings for Water Heaters. It was approved on behalf of the Council of the Standards Association of Australia on 27 November 1987 and published on 15 July 1988.

The following interests are represented on Committee WS/21/1:

Australian Electrical and Electronic Manufacturers Association
Australian Gas Association
Australian Institute of Building
Confederation of Australian Industry
Engineering and Water Supply Department, S.A.
Federated Master Plumbers of Australia
Gas Appliance Manufacturers Association of Australia
Melbourne and Metropolitan Board of Works
Metal Trades Industry Association of Australia
Queensland Water Resources Commission
Royal Australian Institute of Architects
State Electricity Commission of Victoria
Water Authority of Western Australia
Water Board, Sydney

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

This Standard was issued in draft form for comment as DR 85258.

STANDARDS AUSTRALIA

Amendment No 1
to
AS 1357.1—1988
Water valves for use with unvented water heaters
Part 1—Protection valves

REVISED TEXT

The 1988 edition of AS 1357.1 is amended as follows; the amendment(s) should be inserted in the appropriate place.

SUMMARY: This Amendment applies to Clauses 2.2 and 4.5.2; Figure E1; Appendices, G, H and J.

Published on 4 September 1989.

AMDT No 1 SEPT. 1989

Page 7. Clause 2.2.

Delete existing Clause and *substitute* the following:

2.2 EFFECT ON WATER. Materials in contact with potable water shall comply with the following:

(a) Metal or metal-alloy components shall not contain more than 6 percent lead.
NOTE: It is intended that the maximum lead content for metal-alloy will be reduced to 4.5 percent by 1 January 1992.

(b) Non-metal components shall be tested in accordance with and comply with BS 6920.

(c) Non-metal components shall be certified as suitable for contact with potable water by one of the following:
(i) National Health and Medical Research Council, Australia
(ii) Food and Drug Administration, U.S.A.
(iii) The Water Research Centre, U.K.
(iv) National Sanitation Foundation, U.S.A.

AMDT No 1 SEPT. 1989

Page 11. Clause 4.5.2.

Delete existing Clause and *substitute:*

4.5.2. Test schedule. Valves shall be tested in accordance with the schedule given in Table 4.2 (Tests 1 to 14). The following shall apply:

(a) *Test 1.* Three valves of each design (see Note), size and maximum set pressure.

(b) *Test 2.*
(i) For compliance with Clause 4.5(a), three valves of each combination of design (see Note), size and set pressure. The three valves used in Test 1 shall be included.
(ii) For compliance with Clause 4.6(b), three valves used in Test 1 only

(c) *Test 3.* The three valves used in Test 1 shall be used.

(d) *Test 4.* Three valves of each combination of rating and set pressure shall be used except that in the case of valves with auxiliary pressure-relief devices which are separately attachable, one valve of each combination of rating and set pressure may be used plus sufficient relief devices to complete the series of tests. The samples shall include those valves from Tests 1, 2 and 3.

(e) *Tests 5 to 7.* Three valves of each combination of design (see Note), size and set pressure shall be subjected to all three tests. All valves tested previously shall be included.

(f) *Tests 8 and 9.* Three valves of each combination of design (see Note), size and set pressure shall be tested. These valves may be either those used in Tests 1 to 7 or new valves. If new valves are used, they shall be first submitted to Tests 5 and 6.

(g) *Test 10.* Three valves of each design (see Note) and maximum set pressure shall be used. They shall be the same valves included in Tests 8 and 9.

(h) *Tests 11 to 13.* Three valves of each design (see Note), size and set pressure shall be subjected to all three tests. These valves shall be the same valves submitted to Tests 8 and 9.

(i) *Test 14.* Three valves of each combination of design (see Note), size and set pressure which have not been subjected to any of the preceding tests shall be used, with the temperature probes rendered inoperative.

NOTE: Valves with optional features such as hot water take-off connections or extended length of inlet connection are considered to be of the same design as the basic valve for the purposes of all tests, other than Tests 1 and 3.

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Page 22. Figure E1.

Under Legend, Item (15):

Delete 'Clause 4.2.3.2' and *substitute* 'Clause 4.5.3'.

Page 24. Appendix G.

Delete Paragraph G3(n) and *substitute:*

(n) Place the test valves in an autoclave.

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Page 25. Appendix H.

In Paragraphs H3(g) and H3(j):

Delete 'adjacent to the temperature probe' and *substitute* 'at the inlet to the inlet connection'.

Page 26. Appendix J.

Delete Paragraph J3(d) and *substitute:*

(d) Place the test valves in an autoclave.

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AUSTRALIAN STANDARD

WATER VALVES FOR USE WITH UNVENTED WATER HEATERS

Part 1
PROTECTION VALVES

AS 1357.1—1988

First published as part of AS B271—1968.
Revised and redesignated AS 1357—1972
In part revised and redesignated AS 1357.1—1988

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PREFACE

This Standard was prepared by the Association's Committee on Water Fittings for Water Heaters to supersede (in part) AS 1357—1972, *Water fittings for protection and control of unvented storage water heaters*. It is the first of a series of two Standards on valves for use with unvented storage water heaters, the Standards being as follows:

AS 1357.1 *Water valves for use with unvented water heaters*
Part 1: *Protection valves* (this Standard)

AS 1357.2 *Water valves for use with unvented water heaters*
Part 2: *Control valves*

In the period since this Standard was first published as AS B271 in 1968, a large body of experience has been gained on this topic but over the years a number of requirements have been demonstrated to be either ambiguous or open to interpretation. In an endeavour to eliminate these discrepancies, the committee felt that it would be appropriate to classify valves as either protection type or control type and to issue separate Standards accordingly.

This Standard (AS 1357.1) deals with three types of protection valves, i.e. temperature/pressure relief valve, expansion control valve and non-return valve. Of these three, the expansion control type is a new classification of what was previously described as a pressure relief valve. The requirements for all three types have been substantially revised and expanded since the issue of AS 1357—1972 and the methods of test (which are now all placed in the appendices) more closely reflect the conditions under which these valves operate in service.

The Standard deals only with protection valves for unvented storage water heaters and gives the minimum requirements for material, design and construction, testing and approval, to provide safe operation when correctly selected and installed. Certain dimensions and settings have been Standardized to facilitate economic production and use.

In the preparation of this Standard, a great deal of assistance concerning operation under Australian conditions was received from water, gas and electricity authorities, departments of labour and industry, and manufacturers of valves and water heaters and the assistance received from these sources is gratefully acknowledged.

It should be noted that this Standard does not specify where these protection valves are to be used; for this information reference should be made to the requirements of regulatory and other authorities and to the following Standards and industrial codes, as appropriate.

Standards:

AS
1056 *Storage water heaters*
Part 1: *General requirements* (AS 1056.1)
1361 *Automatic electric heat exchange water heaters*
1529 *Code of practice for installation of household type hot water supply systems*
2002 *Solar water heaters—Installation*
2712 *Solar water heaters—Design and construction*
3142 *Approval and test specification for electric water heaters*

Industrial Codes (published by the Australian Gas Association and the Australian Liquified Petroleum Gas Association).

AG
102 *Approval requirements for Class A gas water heaters equipped with natural draught combustion systems*
.09 *Approval requirements for Class A gas water heaters equipped with forced or induced draught combustion systems*
110 *Approval requirements for swimming pool heaters*

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
WATER VALVES FOR USE WITH UNVENTED WATER HEATERS

PART 1: PROTECTION VALVES

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard sets out requirements for the design, construction, testing and performance of the following types of water valves of DN 15 minimum size:

(a) Temperature/pressure relief valves.

(b) Expansion control valves.

(c) Non-return valves.

The valves specified above (referred to in this Standard as 'valves') are specifically intended for use with unvented storage water heaters which are required to operate at temperatures—

(a) not normally exceeding 85 °C; and

(b) under emergency conditions, not exceeding 99 °C.

NOTES:

1. For valves used with water heaters which are intended to operate at temperatures above 99 °C (e.g. hot water boilers), see AS 1271.
2. The methods of test detailed in the appendices determine the ability of the water valves specified herein to perform within specified limits of water temperature, pressure and non-return conditions for the protection of unvented storage water heaters.

1.2 APPLICATION. The valves specified in this Standard shall comply with the requirements of the following sections, as appropriate:

Section 1. Scope and General

Section 2. Materials

Section 3. General Design and Construction

Section 4. Temperature/pressure Relief Valves

Section 5. Expansion Control Valve

Section 6. Non-return Valve

1.3 REFERENCED DOCUMENTS. The documents below are referred to in this Standard.

AS

1271 Valves, water gauges and other fittings for boilers and unfired pressure vessels

1349 Bourdon tube pressure and vacuum gauges

1432 Copper tubes for water, gas and sanitation

1572 Copper and copper alloys—Seamless tubes for engineering purposes

1565 Copper alloy ingots and copper and copper alloy castings

1590 Copper alloy threaded pipe fittings for use with tubes threaded with pipe threads of Whitworth form

1645 Copper and copper alloy compression fittings for use in water supply and hot water services

1722 Pipe threads of Whitworth form
Part 1: Sealing pipe threads (AS 1722.1)
Part 2: Fastening pipe threads (AS 1722.2)

2345 An accelerated laboratory test method for assessment of the susceptibility of brass to dezincification

2837 Wrought alloy steels—Stainless steel bars and semi-finished products

BS

6920 Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water

1.4 DEFINITIONS. For the purpose of this Standard, the definitions below apply.

1.4.1 Auxiliary pressure-relief device—pressure operated device forming part of an expansion control valve or temperature/pressure relief valve which is to provide expansion relief in the event of blockage of the drain outlet.

1.4.2 Expansion control valve—pressure-actuated relief valve which opens in response to an increase in pressure caused by the expansion of the water during the normal heating cycle of the water heater and which is designed for installation on the cold water supply to the water heater.

1.4.3 Non-return valve—valve which prevents reversal of flow by means of the non-return mechanism.

1.4.4 Pressures—unless otherwise stated, all pressures quoted in this Standard are gauge pressures.

1.4.5 Opening pressure—pressure at the inlet of a valve that first causes it to open.

1.4.6 Reseating pressure—pressure at the inlet of a valve that first allows it to close.

1.4.7 Set pressure—pressure at which a valve is designated to operate.

1.4.8 Opening temperature—temperature at the inlet of a valve that first causes it to open.

1.4.9 Reseating temperature—temperature at the inlet of a valve that first allows it to close.

1.4.10 Set temperature—temperature at which a valve is designated to operate.

1.4.11 Temperature/pressure relief valve—valve designed to provide automatic relief in case of excess temperature or pressure, or both.

1.4.12 Stringer(s)—an elongated mass of microconstituents or foreign material in wrought metal oriented in the direction of working.