

Australian/New Zealand Standard™

Gas appliances

Part 1.2: Gas fired water heaters for hot water supply and/or central heating



AS/NZS 5263.1.2:2020

This Joint Australian/New Zealand Standard™ was prepared by Joint Technical Committee AG-001, Gas Appliances. It was approved on behalf of the Council of Standards Australia on 6 December 2019 and by the New Zealand Standards Approval Board on 18 December 2019.

This Standard was published on 24 January 2020.

The following are represented on Committee AG-001:

- Association of Accredited Certification Bodies
- Australian Gas Association
- Australian Industry Group
- Consumer Electronics Suppliers Association
- Consumers Federation of Australia
- Energy Networks Australia
- Gas Appliance Manufacturers Association of Australia
- Gas Association of New Zealand
- Gas Energy Australia
- Gas Technical Regulators Committee
- Gas Utilisation Institute, New Zealand
- Joint Accreditation System of Australia and New Zealand
- NSW Fair Trading
- WorkSafe New Zealand — Energy Safety

This Standard was issued in draft form for comment as DR AS/NZS 5263.1.2:2019.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

www.standards.govt.nz

ISBN 978 1 76072 695 9

Australian/New Zealand Standard™

Gas appliances

Part 1.2: Gas fired water heaters for hot water supply and/or central heating

Originated in Australia as AG 102—1976.
Previous and first joint edition AS/NZS 5263.1.2:2016.
Second edition 2020.

COPYRIGHT

© Standards Australia Limited/the Crown in right of New Zealand, administered by the New Zealand Standards Executive 2020

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth) or the Copyright Act 1994 (New Zealand).

Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee AG-001, Gas Appliances, to supersede AS/NZS 5263.1.2:2016, *Gas appliances — Part 1.2: Gas fired water heaters for hot water supply and/or central heating*.

This Standard provides particular requirements for gas fired water heaters for hot water supply and/or central heating that apply in addition to or in place of the general requirements for gas appliances set out in AS/NZS 5263.0, *Gas appliances, Part 0: General requirements*. The combination of AS/NZS 5263.1.2 (this Standard) and AS/NZS 5263.0 supersedes the combination of AS/NZS 5263.1.2:2016 and AS 5263.0—2013.

This Part 1.2 of AS/NZS 5263 supplements or modifies the corresponding clauses of Part 0. The numbering of clauses in this Part 1.2 is consistent with the numbering in Part 0 for related requirements.

Statements used in this Part 1.2 to explain the relationship of clauses in this Standard to the corresponding clauses in Part 0 are as follows:

- (a) “This Clause of AS/NZS 5263.0 applies”, in which case the corresponding clause of Part 0 and its subclauses are used without modification.
- (b) “This Clause of AS/NZS 5263.0 applies, except as modified below”, in which case the corresponding clause of Part 0 and its subclauses are used but with the modifications, as listed in this document.
- (c) “Not applicable”, in which case the corresponding clause of Part 0 is not used in this context.

Otherwise the text in this Standard replaces the corresponding clause of Part 0.

Any clauses in this Standard that are additional to the requirements of Part 0 are numbered beginning from 101 (except for additional definitions, which begin from 201). Additional appendices in this Part 1.2 are designated with letters starting from AA, and additional clauses in appendices are numbered beginning from 101 (e.g. ZA.101).

Where an appendix or part of an appendix (i.e. clause, figure or table) is cited in this Standard, reference should first be made to Part 0 for the content of the Appendix, which may be modified by this Part 1.2.

This Standard (AS/NZS 5263.1.2), together with the Standard AS/NZS 5263.0 (Part 0), constitute a means of conformance to AS 3645, *Essential requirements for gas equipment*, for gas fired water heaters for hot water supply and/or central heating.

The objective of this Standard is to provide manufacturers, designers, regulatory authorities, conformity assessment bodies and similar organizations with uniform minimum requirements for the safety, performance and use of gas appliances.

This Standard should not be regarded as a design specification or as an instruction manual.

Consideration has been given to —

- (i) continuity of satisfactory operation;
- (ii) the prevention of fire hazards, and explosions;
- (iii) the prevention of injury to persons or property;
- (iv) gas rules and regulations now in force; and
- (v) relevant International Standards.

AS/NZS 5601 series of Standards provides essential requirements and means of conformance for gas installations. Any reference to AS/NZS 5601 in AS/NZS 5263 series Standards should be considered

as reference to the appropriate part of the AS/NZS 5601 series of Standards (i.e. AS/NZS 5601.1 or AS/NZS 5601.2).

The terms “normative” and “informative” are used in Standards to define the application of the appendix to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

Contents

Preface	ii
Section 1 Scope and general	1
1.1 Scope and application.....	1
1.1.1 Scope.....	1
1.1.2 Application.....	1
1.2 Normative references.....	1
1.3 Terms and definitions.....	2
1.4 Test methods.....	4
Section 2 Design and construction	6
2.1 Scope.....	6
2.2 General design requirements.....	6
2.2.101 Covers on cold water feed tanks.....	6
2.2.102 Venting of central heating waterways.....	6
2.3 Materials.....	6
2.4 Design for assembly and installation.....	6
2.4.5 Restraint where a hose assembly is used.....	6
2.5 Design for maintenance.....	6
2.5.8 Means for gas pressure measurement.....	6
2.5.101 Collection and removal of corrosion product.....	6
2.5.102 Provision for draining.....	6
2.5.103 Drain valves.....	7
2.6 Design for operation.....	7
2.6.4 Primary guards openings.....	7
2.7 Controls and safety devices.....	7
2.7.3 Main burner shut off provision.....	7
2.7.101 Relief valves for unvented appliances containing more than 1 L of water.....	7
2.7.102 Relief devices for unvented appliances containing less than 1 L of water.....	7
2.7.103 Thermostats.....	7
2.7.104 Over-temperature cut-out devices.....	7
2.7.105 Controls for manually operated instantaneous water heaters.....	8
2.7.106 Controls for automatic instantaneous water heaters.....	8
2.7.107 Cold water feed tank overflow.....	8
2.7.108 Temperature controls for central heating boilers and combination appliances.....	8
2.7.109 Expansion vessel and pressure gauge for central heating boilers.....	9
2.8 Gas train.....	9
2.8.5 Main burner automatic shut off valves.....	9
2.9 Combustion air and flue systems.....	9
2.9.5 Design of flue connection.....	9
2.9.101 Flueing of indoor appliances.....	10
2.10 Fan assisted combustion systems.....	10
2.11 Burners and ignition systems.....	10
2.11.10 Tray type burners-turndown limits.....	10
2.12 Components.....	10
2.13 Cylinders and cylinder compartments.....	10
2.14 Markings.....	10
2.14.2 Permanent markings on appliances.....	10
2.14.12 Label on guard.....	11
2.14.14 Markings on packaging.....	11
2.14.101 Identification of connections.....	11
2.14.102 Relief valve warning notice.....	11
2.14.103 Temperature setting markings.....	11
2.14.104 Marking of cold water feed tank water levels.....	11
2.14.105 Energy label — Water heaters and combination appliances.....	11

2.15	Instructions.....	11
2.15.2	Installation.....	12
Section 3	Preliminary test — Line gases.....	13
3.1	General.....	13
3.2	Preparation for testing.....	13
3.2.101	Additional setting up for hydronic heating appliances.....	13
3.3	Gas leakage.....	13
3.4	Gas consumption.....	13
3.4.2	Determined gas consumption of permanent pilots.....	13
3.5	Gas pressure regulators.....	13
3.6	Ignition and safety shut off systems.....	14
3.6.1	General requirements.....	14
3.6.2	Additional requirements for atmospheric burners with automatic burner ignition systems not based on permanent pilots.....	14
3.6.3	Additional requirements for fan assisted combustion systems with automatic ignition not based on permanent pilots.....	14
3.7	Ignition of draped fabric.....	14
Section 4	Tests under limiting conditions.....	15
4.1	General.....	15
4.2	CO/CO ₂ ratio limits for any independent surface combustion burner — Underload.....	15
4.3	CO/CO ₂ ratio limits for any independent burner — Overload.....	15
4.4	CO/CO ₂ ratio limits for permanent pilots — Overload.....	15
4.5	Flame characteristics at maximum and minimum limiting conditions.....	15
4.6	Burner ignition at maximum and minimum limiting conditions.....	15
4.7	Delayed ignition at maximum and minimum limiting conditions.....	15
4.8	Reignition at turndown under draught conditions.....	15
4.9	Pilot ignition and stability at maximum and minimum limiting conditions.....	15
4.10	Burner stability when changing setting.....	15
4.11	Unburnt gas release from burner system.....	15
4.12	Blocked flueway terminal.....	15
4.13	Case pressure test.....	15
4.14	Effect of opening and closing doors at turndown condition.....	16
4.15	Sooting — Luminous effect appliances.....	16
4.16	Burner interference at ignition or during combustion.....	16
Section 5	Performance specifications.....	17
5.1	Combustion air supply.....	17
5.2	Flue operation.....	17
5.2.3	Performance with updraught, downdraught and blocked flue.....	17
5.2.7	Safety shutdown — Combustion products limits.....	17
5.2.101	Combustion products spillage device — Storage water heaters.....	18
5.3	Condensate.....	18
5.4	Temperature hazards.....	18
5.4.2	Appliance operating conditions.....	18
5.4.6	Temperature limits — Appliance safety.....	18
5.4.7	Temperature limits — Protection from contact with the heat source.....	19
5.5	Heat resistance of appliance.....	19
5.5.1	Resistance to temperatures.....	19
5.5.3	Minimum temperature requirements of heat exchangers during warming-up period.....	19
5.5.4	Maximum temperature requirements for heat exchanger materials.....	19
5.6	Durability.....	19
5.6.101	Hydrostatic cycling requirements — Water heaters and combination appliances.....	19
5.6.102	Water operated automatic gas valves.....	19
5.7	Electrical supply variation or failure.....	19
5.8	Appliance operation under linting conditions.....	19
5.9	Rain test for outdoor and room sealed appliances.....	19

5.10	Operation under windy conditions.....	20
5.11	Strength and stability	20
	5.11.4 Hydrostatic strength.....	20
	5.11.7 Attachment of primary guard.....	20
	5.11.8 Strength of primary guard incorporating glass.....	20
5.12	Thermal efficiency.....	20
	5.12.101 Minimum thermal efficiency.....	21
	5.12.102 Maintenance gas consumption — Storage water heaters (Australia only).....	21
	5.12.103 Stratification	21
5.13	Vitiation and emissions.....	22
5.101	Operation of controls and relief devices	22
	5.101.1 Drain performance.....	22
	5.101.2 Over-temperature cut-out device — Water heaters.....	22
	5.101.3 Temperature control — Storage water heaters.....	22
	5.101.4 Instantaneous water heaters without automatic outlet temperature control.....	23
	5.101.5 Instantaneous water heaters with automatic outlet temperature control.....	23
	5.101.6 Relief device of unvented water heaters containing less than 1 L of water.....	23
	5.101.7 Central heating boilers and combination appliances.....	23
5.102	Verification of marked values.....	24
	5.102.1 Heat output.....	24
	5.102.2 Water heating capacity — Instantaneous water heaters.....	25
	5.102.3 Storage capacity tolerance for storage water heaters.....	25
Appendix AA (normative) Energy labelling		26
Appendix BB (informative) Discharge flow rate for relief device test.....		32
Appendix ZA (normative) Preliminary test methods.....		34
Appendix ZB (normative) Limiting conditions test methods.....		37
Appendix ZC (normative) Performance test methods.....		40
Bibliography.....		86

Australian/New Zealand Standard

Gas appliances

Part 1.2: Gas fired water heaters for hot water supply and/or central heating

Section 1 Scope and general

1.1 Scope and application

1.1.1 Scope

This Standard provides specific requirements and test methods for gas water heaters and central heating boilers, with an energy input not exceeding 500 MJ/h, and includes types intended for the supply of hot water at a maximum temperature of 99 °C for —

- (a) sanitary, potable and drinking purposes;
- (b) hydronic space heating; and
- (c) a combination of Item (a) and Item (b).

For Australia, the fuel gases are natural gas (as described by AS 4564), town gas, liquefied petroleum gas (LP Gas, as described by AS 4670), simulated natural gas (SNG) and tempered liquefied petroleum gas (TLP).

For New Zealand:

- (i) The fuel gases are natural gas (as specified in NZS 5442) and general product liquefied petroleum gas (NZLPG) (as specified in NZS 5435).
- (ii) The thermal efficiency requirements are informative only, except where they relate to safety.

NOTE Other statutory and regulatory requirements may be applicable to a product that falls within the scope of this Standard. It is the responsibility of the manufacturer, importer or distributor (as appropriate) to ensure that products conform to such requirements.

Test methods are set out in [Appendices ZA, ZB and ZC](#) (see [Clause 1.4](#)).

1.1.2 Application

This Standard is complementary to, and is intended to be used in conjunction with, AS/NZS 5263.0. The requirements given herein shall take precedence over corresponding requirements in that Standard.

AS 3645 specifies essential requirements for gas equipment that requires regulatory approval before sale. This Standard, together with AS/NZS 5263.0, is intended to provide a means of demonstrating conformance to AS 3645.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document:

NOTE Documents for informative purposes are listed in the Bibliography.

AS 1357.1, *Valves primarily for use in heated water systems, Part 1: Protection valves*

AS/NZS 5263.0, *Gas appliances, Part 0: General requirements*

IEC 60730-2-9, *Automatic electrical controls, Part 2-9: Particular requirements for temperature sensing control*