

AS/NZS 4012:2025



Australian/New Zealand Standard™

Domestic solid fuel burning appliances — Method for determination of power output and efficiency



AS/NZS 4012:2025

This Joint Australian/New Zealand Standard™ was prepared by Joint Technical Committee CS-062, Solid Fuel Burning Appliances. It was approved on behalf of Standards Australia's Standards Development and Accreditation Committee on 26 May 2025 and by the New Zealand Standards Approval Board on 04 June 2025.

This Standard was published on 20 June 2025.

The following are represented on Committee CS-062:

- Applied Research Services (Testing Interests New Zealand)
- Australasian Fire and Emergency Service Authorities Council
- Australian Building Codes Board
- Australian Chamber of Commerce and Industry
- Australian Forest Products Association
- Australian Home Heating Association
- Australian Industry Group
- Australian Solid Fuel Testing (Testing Interests Australia)
- Building System Performance, Ministry of Business, Innovation and Employment
- Clean Air Society of Australia & New Zealand
- Department of Energy, Climate Change, the Environment and Water (NSW)
- Department of Water and Environmental Regulation (WA)
- Employers And Manufacturers Association New Zealand
- Energy Efficiency and Conservation Authority of New Zealand
- Environment, Planning and Sustainable Development Directorate (ACT)
- Firewood Association of Australia
- Ministry for the Environment New Zealand
- National Association of Testing Authorities Australia
- National Retail Association Australia
- New Zealand Home Heating Association
- Pattle Delamore Partners
- The University of Adelaide
- Wood Pellet Producers Advisory Group

This Standard was issued for comment as DR AS/NZS 4012:2024

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 products by visiting:

www.standards.org.au

www.standards.govt.nz

ISBN: 978 1 76175 245 2

Australian/New Zealand Standard™

Domestic solid fuel burning appliances — Method for determination of power output and efficiency

First published in Australia as AS 4012—1992.

First published in New Zealand as NZS 7402:1992.

Jointly revised and redesignated as AS/NZS 4012:1999.

Previous edition 2014.

Third edition 2025.

How to read this Standard

This page explains the meaning of the language and structure of this Standard.

Refer to Standards Australia's [Standardisation Guide 006](#) for more details about drafting rules.

Australian and Australian/New Zealand Standards are voluntary unless they are referenced in legislation or called up in contracts.

Requirements

To conform to a Standard, all requirements in the Standard need to be met.

A requirement is any statement in the Standard which uses the word "shall".

Recommendations, permissions and possibilities

The following words are commonly used in Standards, but statements using them do not have to be followed to conform to the Standard:

- (a) "should" means that something is recommended.
- (b) "may" means that something is permitted.
- (c) "can" means that something is possible.

Structure of Standards

A Standard always has the following parts:

- (i) The Preface states who developed the Standard, what the Standard is aiming to do, and how it relates to other documents.
- (ii) The Scope states what the Standard is about, what it covers and what it does not cover.
- (iii) The Normative references clause lists other documents that are referenced in the Standard as part of requirements.
- (iv) The Terms and definitions clause defines important terms to help with understanding the Standard.

A Standard may also include other parts, such as the following:

- (1) A normative appendix sets additional requirements that need to be conformed to.
- (2) An informative appendix provides additional information or guidance. An informative appendix provides additional information or guidance. They usually do not contain requirements. If an informative appendix does contain requirements, the Standard will explain when those requirements apply.
- (3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CS-062, Solid Fuel Burning Appliances, to supersede AS/NZS 4012:2014.

This document sets out sufficiently comprehensive specifications and instructions to enable all interested organizations with appropriate test facilities to determine the power output and efficiency of solid fuel burning appliances.

The results of testing to this method may be used by consumers during selection of solid fuel burning appliances.

The test method described in this document enables a comparison of appliance performance in a laboratory setting; however, the results may not reflect performance under uncontrolled real-world conditions.

The major change in this edition is as follows:

- (a) If a Standard is referenced in legislation, the legislative instrument or regulation specifies the date on which the Standard comes into effect. Regulatory authorities have indicated three years as an appropriate transition period from the date of publication for the removal of central heating appliances from the list of excluded appliances list in [Clause 1.1](#). Refer to the relevant regulatory authority for further information.

The terms “normative” and “informative” are used in Standards to define the application of the appendices 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	Page
Preface	v
1 Scope and general	1
1.1 Scope	1
1.2 Normative references	1
1.3 Terms and definitions	1
2 Principle	3
3 Apparatus	3
4 Test enclosure and flue	4
4.1 General	4
4.2 Room insulation	4
4.3 Length of flue	4
4.4 Exposed flue within calorimeter room	4
4.4.1 Freestanding appliances	4
4.4.2 Fireplace-insert appliances	4
4.4.3 Built-in appliances	4
4.5 Air temperatures	5
4.6 Air pressure	5
4.7 Wall temperatures	5
4.8 Air flow	5
4.9 Calibration	5
4.9.1 Calorimeter room	5
4.9.2 Barometer	5
4.9.3 Anemometer	6
4.9.4 Weighing instruments	6
5 Measurement accuracy	7
5.1 Temperature and mass flow	7
5.2 Calorimeter room scales	7
5.3 Uncertainty of measurement of efficiency	8
6 Test fuel	8
6.1 General	8
6.2 Fuel chamber usable volume	8
6.3 Test fuel load	8
6.3.1 General	8
6.3.2 Firewood test fuel load mass	8
6.3.3 Coal test fuel load mass	9
6.3.4 Combination firewood and coal fuels	9
6.4 Firewood piece dimensions	9
6.4.1 General	9
6.4.2 Length range	9
6.4.3 Cross-section	9
6.4.4 Calculation of number of fuel pieces in a test fuel load	10
6.4.5 Firewood piece length	10
6.5 Test fuel requirements for Australia	10
6.6 Test fuel requirements for New Zealand	10
7 Test procedure	10
7.1 Preparation before testing	10
7.1.1 Appliance air flow test	10
7.1.2 Conditioning burn	10
7.1.3 Post-conditioning adjustment	11
7.1.4 Ash	11
7.1.5 Fire lighting	11
7.1.6 Pretest burn cycle	11
7.2 Fuel loading	11

7.2.1	General	11
7.2.2	Firewood loading geometry	11
7.2.3	Coal fuel-loading geometry	12
7.2.4	Mixed firewood and coal fuel-loading geometry	12
7.3	Burn rates	12
7.4	Burn cycle	12
7.5	Number of burn cycles	12
7.6	Data-recording interval	13
7.7	Operation of the appliance	13
7.7.1	Baffle bypass damper	13
7.7.2	Burn-rate control	13
7.7.3	Fans	13
7.7.4	Other controls	13
7.7.5	Automatic controls	13
7.8	Appliances with a water-heating facility	13
7.9	Ducted appliances	14
7.10	Post-burn appliance air-flow test	14
8	Calculation and reporting of results	14
8.1	Calculations	14
8.1.1	Average power	14
8.1.2	Heat output	14
8.1.3	Energy input	14
8.1.4	Efficiency	14
8.1.5	Fuel consumption rate	15
8.2	Test report	15
9	Marking	15
9.1	General	15
9.2	Compulsory permanent marking	15
9.3	Fuel types	16
9.4	Additional marking	16
9.5	Retesting exemption	16
9.6	Sample Marking Plates	16
10	Minimum allowable heating efficiency level	18
10.1	General	18
10.1.1	For Australia	18
10.1.2	For New Zealand	19
10.2	Valid tests	19
	Appendix A (informative) Firewood determination—worked example	20
	Appendix B (normative) Method for determination of water heating heat output and power	22
	Bibliography	25

NOTES

Australian/New Zealand Standard™

Domestic solid fuel burning appliances — Method for determination of power output and efficiency

1 Scope and general

1.1 Scope

This document sets out a method for the determination of the average efficiency and average thermal power output from a batch-fed domestic solid fuel burning appliance and the associated efficiency acceptance criteria.

Appliances within the scope of this document include —

- (a) space-heating appliances; and
- (b) space-heating appliances that include water-heating devices.

Appliances excluded from this document are —

- (i) site-built masonry appliances;
- (ii) cooking appliances;
- (iii) appliances intended solely for water heating;
- (iv) appliances intended solely to distribute convective heat via ducting to locations remote from the appliance; and
- (v) appliances that, when fired at the high burn rate [see [Clause 7.3\(a\)](#)] prescribed in this document, have a maximum carbon dioxide output from the combustion chamber of less than 5 % by volume with any optional doors fitted and closed.

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 referenced for informative purposes are listed in the Bibliography.

AS/NZS 4013, *Domestic solid fuel burning appliances—Method for determination of flue gas emission*

AS/NZS 4014 (all parts), *Domestic solid fuel burning appliances—Test fuels*

1.3 Terms and definitions

For the purposes of this document, the definitions given in AS/NZS 2918, AS/NZS 3869, AS/NZS 4013 and the following apply.

1.3.1

appliances above 25 kW

heating appliance that has a maximum heat output rate greater than 25 kW, as measured for a period of not less than six minutes and under high burn rate conditions

Note 1 to entry: This is with a fuel load calculated with a nominal volume of 16.5 % of the fuel chamber usable volume, as described in [Clause 6.3.1](#)