

AS 4014.1/NZS 7404.1

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Australian Standard®
New Zealand Standard

**Domestic solid fuel burning
appliances—Test fuels**

Part 1: Hardwood

AUS B
NZ AA



Standards Association
of New Zealand



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Standards Australia Committee CS/62, Solid Fuel Burning Appliances

AMDEL Limited
Australian and New Zealand Environment and Conservation Council
Australian Assembly of Fire Authorities
Australian Chamber of Manufactures
Australian Consumers Association
Australian Federation of Consumer Organizations
Australian Fire Protection Association
Australian Institute of Building Surveyors, N.S.W. Chapter
Australian Solid Fuel & Wood Heating Association
Australian Uniform Building Regulations Coordinating Council
Business and Consumer Affairs, N.S.W.
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Insurance Council of Australia
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Ministry of Consumer Affairs
Office of Consumer Affairs, Tas.
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New Zealand Home Heating Association
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NZS 7404.1:1992

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Part 1: Hardwood

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PREFACE

This Standard was prepared by the Standards Australia Committee on Solid Fuel Burning Appliances to provide testing agencies with a consistent fuel specification when testing solid fuel burning appliances for compliance with the requirements of AS 4012/NZS 7402 and AS 4013/NZS 7403. It is issued as a joint Standard under the terms of the Memorandum of Understanding between Standards Australia and the Standards Association of New Zealand with the objective of reducing technical barriers to trade between the two nations.

This Standard is part of a series used when testing solid fuel burning appliances intended for operation in Australia and New Zealand. Other Standards in this series are as follows:

- Part 2: Softwood
- Part 3: Lignite briquettes
- Part 4: Sub-bituminous coal

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FOREWORD

Determination of reliable and repeatable test results when testing appliances for compliance with AS 4012/NZS 7402, *Domestic solid fuel burning appliances—Method for determination of power output and efficiency*, and AS 4013/NZS 7403, *Domestic solid fuel burning appliances—Method for determination of flue gas emission* is essential and requires control of many factors. This Standard has been prepared to provide testing agencies with means for preparing consistent batches of test fuels so that the test results produced when testing different appliances may be readily compared and correlated.

The fuel types listed in this Standard are not exhaustive. The fuel types referred to in this series are only intended for use when testing appliances to be installed and operated in Australia and New Zealand. To achieve wider use of these Standards when testing appliances for compliance with AS 4012/NZS 7402 and AS 4013/NZS 7403, they have been structured to allow additional test fuel types to be added from those listed, when the fuel type commonly used is different.

STANDARDS AUSTRALIA/STANDARDS ASSOCIATION OF NEW ZEALAND

Australian Standard/New Zealand Standard
Domestic solid fuel burning appliances—Test fuels**Part 1: Hardwood**

1 SCOPE This Standard sets out a method for the determination of hardwood test fuels to be used when applying the test methods described in AS 4012/NZS 7402 and AS 4013/NZS 7403.

2 APPLICATION Fuels complying with this Standard are to be used when testing solid fuel appliances for compliance with AS 4012/NZS 7402 and AS 4013/NZS 7403, when these appliances are intended for installation and operation in Australia and New Zealand.

3 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS	
4012	Domestic solid fuel burning appliances—Method for determination of power output and efficiency
4013	Domestic solid fuel burning appliances—Method for determination of flue gas emission
NZS	
7402	Domestic solid fuel burning appliances—Method for determination of power output and efficiency
7403	Domestic solid fuel burning appliances—Method for determination of flue gas emission
ASTM	
D 1102-84	Standard test method for ash in wood
ISO	
1928	Solid mineral fuels—Determination of gross calorific value by the calorimeter bomb, and calculation of net calorific value

4 PRINCIPLE Sample pieces selected from test fuel are tested to ensure that all test fuel meets the range of density, moisture content, calorific value and ash content specified.

5 TEST FUEL

5.1 General The test fuel shall be any bark-free hardwood, and shall not include pieces with rotted sections. Samples of wood shall be tested at the rates specified in Clauses 5.2 to 5.5.

5.2 Moisture content Each test fuel piece shall have a moisture content of 12% to 16% of the wet mass of the wood, determined in accordance with Appendix A. Sufficient samples shall be tested to ensure that all firewood used as test fuel is within this range. One sample taken from each larger log which is to be cut into test fuel pieces is sufficient for this purpose.

5.3 Density Samples for determining density shall be within the allowable range of moisture content specified in Clause 5.2 before oven-drying and shall be free from splits and voids. The density of the firewood shall be within the range 0.8 to 0.9 kg/L calculated by dividing the oven-dry mass by the volume before drying. The overall accuracy of this measurement shall be $\pm 10\%$. Sufficient samples shall be tested to ensure that all firewood used as test fuel is within this range. One sample taken from each larger log which is to be cut into test fuel pieces is sufficient for this purpose.

5.4 Ash content The ash content of test fuel from the same origin shall be determined in accordance with ASTM D 1102-84 at a sampling rate of three samples per tonne. The ash content shall be no greater than 0.5% by weight (oven-dry).

5.5 Gross calorific value The gross calorific value or high heating value of test fuel from the same origin shall be determined in accordance with ISO 1928 at a sampling rate of three samples per tonne.

6 REPORT The following properties shall be reported for the test fuel samples:

- (a) Density (oven-dry basis).
- (b) Moisture content (wet mass basis).
- (c) Ash content (oven-dry basis).
- (d) Calorific value (oven-dry basis).
- (e) The name of the testing agency, date of test and the name of the person responsible for determining the properties of the test fuel.
- (f) A reference to this test method, i.e. AS 4014.1/NZS 7404.1.