

AS 2658 – 2003

Australian Standard

**LP Gas — Portable and mobile  
appliances**



**Standards Australia**



This Standard was prepared under the direction of AG/1, the Gas Appliance Standards Committee of The Australian Gas Association by Working Group 10 (WG/10) and subsequently endorsed by AG/1. As an accredited Standards Development Organisation, The Australian Gas Association develops and publishes Australian Standards. The Standard was approved on behalf of the Gas Technical Standards Council on 26 June 2003, and published in June 2003.

---

The following interests are represented on AG/1:

**ACA (Australian Consumer Association)**

**AGA (The Australian Gas Association)**

**ALPGA (Australian Liquefied Petroleum Gas Association Ltd)**

**Appliance & Component Testing Bodies**

**GAMAA (Gas Appliance Manufacturers Association of Australia)**

**Gas Distributors**

**Gas Retailers**

**GTRC (Gas Technical Regulators Committee)**

The following interests are represented on WG/10:

**ALPGA (Australian Liquefied Petroleum Gas Association Ltd)**

**AGA (The Australian Gas Association)**

**GAMAA (Gas Appliance Manufacturers Association of Australia)**

**WorkCover New South Wales**

---

### **Keeping Standards up-to-date**

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Australian Standards can be found by visiting the Standards Australia web site at [www.standards.com.au](http://www.standards.com.au) and looking up the relevant Standard in the on-line catalogue.

Alternatively, an annual printed Catalogue is available with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia offers a number of update options. For information about these services, users should contact Standards Australia.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of Standards Australia International.

AS 2658 – 2003

Australian Standard

**LP Gas — Portable and mobile  
appliances**

Originated as AG 113, 1978  
First edition as Australian Standard AS 2658, 1983  
Second edition as Australian Standard AS 2658, 1988  
This edition AS 2658, 2003

**COPYRIGHT**

© Australian Gas Association

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.

Published by the Australian Gas Association

ISBN 085852 301 9

## FOREWORD

This Standard is concurrent with AS 2658 - 1988 *Liquefied Petroleum (LP) Gas - Portable and Mobile Appliances*. The 1988 edition will remain current until the committee has completed its review of the following sections at which time the 1988 edition will be withdrawn.

- Requirements related to appliances supplied by an integral gas cartridge
- Requirements related to maximum gas consumption, integral gas storage capacity and supply pressure to the inlet of the appliance
- Section 7 Hand held eating tools
- Section 8 Preparation for testing, in particular gas test pressures

The Standard is intended to provide uniform minimum requirements for the safe design and performance of LP Gas portable and mobile appliances supplied with gas at vapour pressure.

In the writing of this standard the committee considered relevant content from UL (Underwriters Laboratories Inc), JIS (Japan Industrial Standards), KIS (Korean Industrial Standards), ANSI (American National Standards Institute), EN (CEN - European Committee for Standardisation) standards.

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

In its preparation, consideration has been given to:

- continuity of satisfactory operation of appliances and equipment;
- the prevention of fire hazards, and explosions;
- the prevention of injury to persons or property;
- gas rules and regulations now in force; and
- relevant International Standards.

The Australian Gas Association does not accept responsibility for any inadequacies in this Standard. This Standard sets out acceptable Standards for type testing of the appliance itself, and does not in any way remove the responsibility from any installation, commissioning or maintenance personnel for ensuring that the appliance remains in a safe condition after installation or maintenance work has been carried out.

Matters relating to quality assurance systems, production testing and certificates of conformity, including those for auxiliary devices are not dealt with in this Standard.

Matters of an advisory nature are indicated by the word 'NOTE' followed by a statement.

The Definitions section contains the definitions of terms or words as they apply to this Standard.

This Standard has no legal authority in its own right, but may acquire legal standing in one or more of the following circumstances:

- adoption by a government or other authority having jurisdiction over relevant appliances; adoption by a purchaser as the required standard when placing a contract for relevant appliances; or
- adoption where a contractor states that an appliance is in accordance with the Standard.

**Chief Executive The Australian Gas Association, June 2003**

## CONTENTS

	<i>Page</i>
<b>SECTION 1 SCOPE AND GENERAL</b>	<b>9</b>
1.1 SCOPE .....	9
1.2 APPLICATION .....	9
1.3 DEFINITIONS .....	11
<b>SECTION 2 GENERAL REQUIREMENTS</b>	<b>15</b>
2.1 GENERAL REQUIREMENTS .....	15
2.1.1 Portable appliances .....	15
2.1.2 Mobile appliances .....	15
2.2 COMPONENTS .....	15
2.2.1 Certification of safety components .....	15
2.2.2 Limitation of gas flow .....	15
2.2.3 Holes for screws, pins etc .....	15
2.2.4 Metal-to-metal joint or joints .....	15
2.2.5 Removable components .....	15
2.2.6 Soft solder .....	15
2.2.7 Flame supervision devices .....	15
2.3 MECHANICAL DESIGN .....	16
2.3.1 Stability .....	16
2.3.2 Displacement of parts .....	16
2.3.3 Gas containers and associated flexible hose assemblies .....	16
2.3.4 Appliance connected to the gas container by a flexible hose assembly .....	17
2.3.5 Appliance connected directly to the gas container .....	17
2.3.6 Appliances directly connected to a pierceable gas cartridge .....	17
2.3.7 Locations and compartments for gas containers .....	17
2.3.8 Burners and radiant elements .....	18
2.3.9 Unburnt gas release from burner system .....	18
2.3.10 Burner mixing tubes .....	18
2.3.11 Gas manifolds .....	18
2.3.12 Flash lighting systems and cross lighting devices .....	18
2.3.13 Joining .....	18
2.3.14 Utensil supports .....	18
2.3.15 Cooking Grids .....	18
2.3.16 User adjustment for different gases .....	19
2.4 MATERIALS AND FINISHES .....	19
2.4.1 Suitability of materials and finishes .....	19
2.4.2 Materials containing asbestos .....	19
2.4.3 Materials in contact with gas .....	19
2.4.4 Materials in contact with food .....	19
2.4.5 Copper tubing .....	19
2.4.6 Brass tubing and fittings .....	19
2.4.7 Die-casting .....	19

2.5 GAS CONNECTIONS.....	19
2.5.1 Connection to appliance and container .....	19
2.5.2 Appliance connections to non-refillable containers .....	20
2.6 DESIGN FOR USE.....	20
2.6.1 Assembly.....	20
2.6.2 Prevention of incorrect assembly.....	20
2.6.3 Accessibility of controls and working parts.....	20
2.6.4 Viewing of burner flames .....	20
2.6.5 Control valve.....	20
2.6.6 Gas Control .....	21
2.6.7 Accumulation of unburnt gas.....	21
2.6.8 Adjusting devices .....	21
2.6.9 Wheels.....	21
2.6.10 Gas systems-resistance to displacement.....	21
2.7 DESIGN FOR MAINTENANCE (GENERAL).....	21
2.7.1 Sharp edges .....	21
2.7.2 Injectors.....	21
2.7.3 Dismantling and replacement by user .....	21
2.7.4 Cleaning, maintenance and removability of parts by an authorized person.....	22
2.8 GAS LEAKAGE.....	22
2.8.1 Gas tightness .....	22
2.8.2 Gas tightness after testing.....	22
2.8.3 Needle valves – gas tightness .....	22
2.9 NOMINAL GAS CONSUMPTION.....	23
2.10 GAS CONSUMPTION .....	23
2.10.1 Tolerance on determined gas consumption.....	23
2.11 TEMPERATURE HAZARDS .....	23
2.11.1 Test conditions .....	23
2.11.2 Floor, wall, overhead and bench surfaces .....	23
2.11.3 Surfaces intended to be handled .....	23
2.11.4 Temperatures of surfaces likely to be accidentally touched.....	24
2.11.5 Temperatures of components.....	24
2.12 HEAT RESISTANCE.....	24
2.12.1 Normal operation.....	24
2.12.2 Lit-back operation .....	25
2.13 IGNITION .....	25
2.13.1 Ignition device.....	25
2.13.2 Normal ignition .....	25
2.13.3 Delayed ignition .....	25
2.13.4 Flame stability.....	25
2.13.5 Burner stability when changing setting.....	26
2.13.6 Flame stability to draught – turndown gas consumption.....	26
2.13.7 Flame characteristics maximum and minimum limiting conditions .....	26
2.14 COMBUSTION TESTS.....	26
2.14.1 Appliances other than heaters, and lamps .....	26
2.14.2 Heaters, and lamps .....	26
2.14.3 Appliances fitted with surface combustion burners .....	26

2.14.4 Sooting .....	26
2.14.5 Condensation .....	26
<b>2.15 INSTRUCTIONS AND MARKING .....</b>	<b>26</b>
2.15.1 Instructions supplied with appliance .....	26
2.15.2 Assembly .....	30
2.15.3 Marking .....	30
2.15.4 Marking of control valves .....	31
2.15.5 Durability of permanent markings .....	32
<b>SECTION 3 ADDITIONAL REQUIREMENTS FOR COOKERS .....</b>	<b>33</b>
<b>3.1 COOKERS WITH INTEGRAL GAS CARTRIDGE .....</b>	<b>33</b>
3.1.1 Overpressure protection .....	33
3.1.2 Instructions .....	33
3.1.3 Markings .....	33
<b>3.2 HOTPLATE BURNERS (on cookers) .....</b>	<b>33</b>
3.2.1 Turndown control .....	33
3.2.2 Ignition .....	34
3.2.3 Flame stability .....	34
3.2.4 Resistance to liquid spillage .....	34
3.2.5 Pan stability .....	34
<b>3.3 OVENS .....</b>	<b>34</b>
3.3.1 Flame safeguards for cooker ovens .....	34
3.3.2 Shelves .....	34
3.3.3 Shelf supports .....	34
3.3.4 Fitting of thermostat .....	34
<b>3.4 STRENGTH- APPLIED LOAD .....</b>	<b>34</b>
<b>3.5 TEMPERATURE HAZARDS .....</b>	<b>34</b>
<b>3.6 HEAT RESISTANCE .....</b>	<b>35</b>
<b>SECTION 4 ADDITIONAL REQUIREMENTS FOR HEATERS .....</b>	<b>36</b>
<b>4.1 APPLICATION OF THIS SECTION .....</b>	<b>36</b>
<b>4.2 FUEL STORAGE CONTAINER .....</b>	<b>36</b>
<b>4.3 MARKING .....</b>	<b>36</b>
<b>4.4 FLAME SAFEGUARDS .....</b>	<b>36</b>
<b>4.5 VITIATION .....</b>	<b>36</b>
4.5.1 Operation in a sealed test chamber - all heaters .....	36
4.5.2 Operation in a sealed test chamber - heaters with gas consumption in excess of 6MJ/h .....	36
<b>4.6 PRIMARY GUARD .....</b>	<b>37</b>
4.6.1 Attachment to the appliance .....	37
4.6.2 Openings in a primary guard .....	37
4.6.3 Cone test .....	37
4.6.4 Smoulder test .....	37
4.6.5 Glass components .....	37

4.6.6 Exposed surfaces .....	37
4.6.7 Primary guard temperature .....	37
4.7 TEMPERATURE HAZARDS .....	37
4.8 HEAT RESISTANCE .....	38
<b>SECTION 5 ADDITIONAL REQUIREMENTS FOR BARBECUES</b>	<b>39</b>
5.1 MARKING .....	39
5.2 TEMPERATURE HAZARDS .....	39
5.2.2 Hood Handles .....	39
5.2.3 Grease receptacle .....	39
5.3 HEAT RESISTANCE .....	39
5.4 MECHANICAL DESIGN .....	40
5.4.1 Provision and location of grease receptacle .....	40
5.4.2 Design to prevent ignition of accumulated grease .....	40
5.4.3 Protection of ports and injectors .....	40
5.4.4 Glass components - resistance to mechanical shock .....	40
5.4.5 Glass components -resistance to thermal shock .....	40
<b>SECTION 6 ADDITIONAL REQUIREMENTS FOR GAS LIGHTS</b>	<b>41</b>
6.1 MARKINGS .....	41
6.2 DURABILITY .....	41
6.3 MANTLES .....	41
<b>SECTION 7 REQUIREMENTS FOR HAND HELD HEATING TOOLS</b>	<b>42</b>
7.1 MARKINGS .....	42
7.1.1 Markings on packaging of hand held heating tools .....	42
7.2 GAS FLOW CONTROL .....	42
7.3 STORAGE CASE OR CONTAINER .....	42
7.4 CLEANING, MAINTENANCE AND REMOVABILITY OF PARTS DESIGNED TO BE REPLACED .....	42
7.5 TEMPERATURE HAZARDS .....	43
7.6 HEAT RESISTANCE .....	43
7.7 FLAME GENERATION .....	43
7.8 DEVICE TO PREVENT INADVERTENT OPERATION .....	43
7.9 GAS TO BE TURNED OFF WHEN CONTROL IS RELEASED .....	43
7.10 RESISTANCE TO SPITTING OR SPUTTERING AND FLARING .....	43

7.11 BURNING BEHAVIOUR .....	43
7.11.1 Burners - lit-back condition .....	43
7.11.2 Flaring, burning and distortion .....	43
7.12 ACCELERATED AGING TEST .....	43
7.13 REFILLABLE CONTAINERS .....	44
7.14 PRESSURE TEST – TOOLS WITH INTEGRAL CONTAINER .....	44
7.15 RESISTANCE TO DROPPING .....	44
<b>SECTION 8 PREPARATION FOR TESTING</b> .....	<b>45</b>
8.1 PREPARATION FOR TESTING .....	45
8.1.1 Test gases .....	45
8.1.2 Test gases used for temperature hazard and heat resistance tests .....	45
8.2 SETTING UP APPLIANCE FOR TESTING .....	47
8.2.1 Appliance set up .....	47
8.2.2 Test conditions - appliances intended for use with non-refillable containers .....	47
8.2.3 Test pressures – appliances intended for use with refillable containers .....	47
8.2.4 Appliance regulators .....	48
8.2.5 Draughts .....	48
8.2.6 Variable restrictors .....	48
<b>APPENDIX A FIGURES 1 TO 6</b> .....	<b>49</b>
<b>APPENDIX B METHODS OF TEST</b> .....	<b>59</b>
B1 M.O.T. 2.2.7 (d) – 2003 — IGNITION - OPENING OF FLAME SAFEGUARD SYSTEM .....	59
B2 M.O.T. 2.2.7 (e) – 2003 — OPERATION OF SAFETY SHUT-OFF SYSTEM .....	60
B3 M.O.T. 2.3.1 – 2003 STABILITY TEST FOR FREE-STANDING APPLIANCES .....	61
B4 M.O.T. 2.3.9 – 2003 BURNER OPERATION - UNBURNT GAS RELEASE FROM BURNER SYSTEM .....	62
B5 M.O.T. 2.4.7 – 2003 — ZINC ALLOY .....	63
B6 M.O.T. 2.6.10 – 2003 — DISPLACEMENT TEST .....	64
B7 M.O.T. 2.8.1 – 2003 GAS LEAKAGE - FULLY ASSEMBLED APPLIANCES .....	65
B8 M.O.T. 2.8.3 (a) – 2003 NEEDLE VALVES - RESISTANCE TO TEMPERATURE .....	67
B9 M.O.T. 2.8.3 (b) – 2003 NEEDLE VALVES - DURABILITY .....	69
B10 M.O.T. 2.10.1 – 2003 GAS CONSUMPTION TEST .....	70
B11 M.O.T. 2.11 – 2003 TEMPERATURE HAZARDS .....	71
B12 M.O.T. 2.11.4.6 / 2.12.1 (b) – 2003 NON-REFILLABLE CONTAINER SAFETY .....	76
B13 M.O.T. 2.12 – 2003 HEAT RESISTANCE .....	78
B14 M.O.T. 2.12.2 – 2003 HEAT RESISTANCE —LIT-BACK CONDITION .....	81
B15 M.O.T. 2.13.2 – 2003 IGNITION .....	82
B16 M.O.T. 2.13.3 – 2003 DELAYED IGNITION .....	83
B17 M.O.T. 2.13.6 – 2003 FLAME STABILITY TO DRAUGHT .....	84
B18 M.O.T. 2.13.7 – 2003 FLAME ABNORMALITY .....	85
B19 M.O.T. 2.14.1/2 – 2003 DETERMINATION OF CO/CO <sub>2</sub> RATIO IN COMBUSTION PRODUCTS .....	86
B20 M.O.T. 2.14.3 – 2003 DETERMINATION OF CO/CO <sub>2</sub> RATIO IN COMBUSTION PRODUCTS OF SURFACE COMBUSTION BURNERS .....	88
B21 M.O.T. 2.15.5 – 2003 MARKING .....	90
B22 M.O.T. 3.2.4. - 2003 SPILLOVER .....	91

B23 M.O.T. 3.2.5 (a) – 2003 PAN STABILITY TEST .....	92
B24 M.O.T. 3.2.5 (b) – 2003 PAN STABILITY TEST .....	93
B25 M.O.T. 4.5 – 2003 VITIATION.....	94
B26 M.O.T 4.5.2 – 2003 SAFETY SYSTEM (Heaters with gas consumption in excess of 6 MJ/h) .....	96
B27 M.O.T. 4.6.1 – 2003 INTEGRITY OF THE PRIMARY GUARD .....	98
B28 M.O.T. 4.6.4 – 2003 FABRIC DRAPE TEST.....	99
B29 M.O.T. 4.6.5 – 2003 RESISTANCE OF PRIMARY GUARDS TO IMPACT.....	101
B30 M.O.T. 5.4.4– 2003 GLASS COMPONENTS – RESISTANCE TO MECHANICAL SHOCK.....	103
B31 M.O.T. 5.4.5 – 2003 GLASS COMPONENTS – RESISTANCE TO THERMAL SHOCK.....	104
B32 M.O.T. 7.10 – 2003 RESISTANCE TO SPITTING OR SPUTTERING AND FLAKING .....	107
B33 M.O.T. 7.11.2 – 2003 BURNING BEHAVIOR.....	106
B34 M.O.T. 7.15 – 2003 DROP TEST .....	107
<b>APPENDIX C TESTING APPARATUS FOR PRIMARY GUARDS</b>	<b>108</b>
<b>APPENDIX D DIAGRAMMATICAL REPRESENTATIONS OF OUTDOOR AREAS</b>	<b>109</b>
<b>APPENDIX E BACKGROUND TO THE TEST GAS PRESSURES IN SECTION 8</b>	<b>112</b>
<b>APPENDIX F LIST OF REFERENCED DOCUMENTS</b>	<b>114</b>

## SECTION 1 SCOPE AND GENERAL

### 1.1 SCOPE

This Standard applies to various types of portable appliances not exceeding 12 MJ/h (250 g/h):

- (a) supplied from a separate gas container with vapourised LP Gas to the inlet at the vapour pressure within the gas container (vapour pressure appliance), and designed to be used:
  - (i) with cartridges complying with EN 417, UL147A/B (or equivalent), or
  - (ii) for connection directly or by flexible hose assembly to an LP Gas supply cylinder complying with AS 2030.1 (or equivalent),
- (b) having an integral gas supply with gas storage in excess of 100 mL water capacity.

Types of portable appliances covered are:

- (a) cooking appliances (hotplates, ovens, grills, barbecues)
- (b) space heating appliances designed for outdoor use
- (c) lighting appliances designed for outdoor use
- (d) hand held heating tools

Appliances covered by this Standard are not designed for connection to a flue for the discharge of products of combustion.

This Standard does not cover appliances that are intended for connection to a fixed piping system in a building, caravan or boat.

#### NOTES:

- 1 Requirements for Storage and handling of LP Gas indoors and outdoors are specified in AS/NZS 1596.
- 2 Requirements for gas cylinders are specified in AS 2030.
- 3 Requirements for cooking appliances designed to operate on a pressure of 2.75 kPa or lower are specified in AS 4551 / AG 101.
- 4 Requirements for space heaters designed to operate on a pressure of 2.75 kPa or lower are specified in AS 4553 / AG 103.
- 5 Requirements for gas refrigerators are specified in AS 4555 / AG105.
- 6 Requirements for barbecues designed to operate on a pressure of 2.75 kPa or lower are specified in AS 4557 / AG 107.

### 1.2 APPLICATION

This Standard specifies the construction and safety requirements for portable and mobile appliances. It also defines performance test methods, and requirements for markings and the information to be provided in instructions.

Appliances shall comply with the requirements of Section 2, and with the requirements of the following Sections according to the nature of the appliance:

- (a) Cookers: Section 3
- (b) Heaters: Section 4
- (c) Barbecues: Section 5
- (d) Gas lights: Section 6