



Industrial and commercial gas-fired appliances



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- Australian Petroleum Production and Exploration Association
 - Energy Networks Association
 - Engineers Australia
 - Gas Appliance Manufacturers Association of Australia
 - Gas Energy Australia
 - Gas Technical Regulators Committee
 - Master Plumbers and Mechanical Services Association of Australia
-

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Australian Standard®

Industrial and commercial gas-fired appliances

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PREFACE

This Standard was prepared by Standards Australia Committee AG-011, Industrial and Commercial Gas-Fired Appliances, to supersede AS 3814:2015, *Industrial and commercial gas-fired appliances*.

The objective of this Standard is to provide uniform minimum requirements for the safe operation of gas-fired industrial appliances and other large appliances used for commercial applications which are not covered by any other Standard.

This Standard does not cover all the requirements for the safety of the process carried out in the appliance. Other statutory and regulatory requirements may be applicable to the appliances or installations, or both, that fall within the scope of this Standard. It is the installer/original equipment manufacturer's responsibility to ensure that appliances and installations conform with these requirements.

This Standard should not be regarded as a design specification or as an instruction manual—it has been prepared with consideration for gas rules and regulations now in force. In its preparation, primary consideration has been given to—

- (a) the prevention of injury to persons; and
- (b) the prevention of fire and explosion hazards associated with fuel use and processes, particularly where they could lead to a risk of injury of persons.

Additionally, consideration has been given to—

- (i) the prevention of damage to property;
- (ii) continuity of satisfactory operation of appliances and equipment;
- (iii) the provision of satisfactory permanent access for service; and
- (iv) relevant international and overseas standards.

This Standard has also been revised to remove ambiguities and to place the responsibility for safety of gas-fired industrial appliances, and other large appliances used for industrial and commercial applications firmly on the original equipment manufacturer (OEM). To this end, the OEM has been given a wide definition in this revision.

The main features of this revision are the following:

- (A) A number of editorial and reference errors in the previous edition of this Standard have been corrected and further notes added to several clauses to help provide guidance to users of this Standard.
- (B) As a result of industry comment, Clause 2.27 on programmable electronic systems (PES) has again been revised to better align with AS 61508 (series) (the related application Standard), AS IEC 61511 (series) and AS 62061.
- (C) The robust nature of gas engines has been reflected in the further revision of Clause 5.8.
- (D) The requirements for hazard and risk assessment have been expanded in line with international practice, including a new informative Appendix K as well as a list of significant hazards covered by this Standard in new informative Appendix M.
- (E) The informative Appendix N on the guidance for verifying that an appliance meets the safety requirements and/or measures in accordance with this Standard has been updated.

- (F) A new informative Appendix O on fitness for purpose has been added to provide guidance on establishing an equivalent level of safety to this Standard. This has been achieved where an appliance or installation has not been specifically constructed to the requirements of this Standard. This also includes legacy appliances or installations that originally conformed with the standards of the day and may now need to be reassessed to determine that they are still fit for purpose.
- (G) A new informative Appendix P on biogas applications has been added for guidance on the application of this Standard to biogas installations.

NOTE: Appendix P is expected to become part of Section 5 of this Standard in the next revision, once industry has applied it and provided the necessary peer review regarding its suitability.

The user should be aware that technical regulators in many jurisdictions in Australia deem this Standard as a 'prescribed or preferred Standard', to which conformity is mandatory.

Notes have been integrated into the text of this Standard. They provide additional information and guidance intended to assist the understanding or use of this Standard. The notes do not contain requirements or any information considered indispensable for the use of this Standard.

The term 'informative' has been used in this Standard to define the application of the appendices to which it applies. An 'informative' appendix is only for information and guidance.

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FOREWORD

Explosions are the main hazard on the firing side of the equipment covered by this Standard, the basic cause being ignition of a combustible mixture in the combustion chamber or associated ductwork. The magnitude and intensity of the explosion will depend on both the quantity of combustibles present and the proportion of air with which the combustibles are mixed.

Explosions could be the result of one or more of the following:

- (a) Improper design of equipment or control systems.
- (b) Equipment or control system malfunction, including valve leakage.
- (c) Interruption and restoration of gas or air supply causing loss of flame followed by delayed ignition of the resultant accumulation of a combustible mixture.
- (d) Flame failure on a burner and subsequent ignition of the resultant accumulation of a combustible mixture.

The presence of a well-trained, reliable and competent operator provides a major contribution to safety.

STANDARDS AUSTRALIA

Australian Standard Industrial and commercial gas-fired appliances

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

1.1.1 General

This Standard sets out the minimum requirements for the design, construction and safe operation of Type B appliances that use any gas, or gases as a gaseous fuel in any combination or with other fuels to produce flame, heat, light, power or special atmosphere.

Construction requirements given relate only to matters affecting gas-firing systems or to any interconnection between the gas-firing system and the safety requirements of the appliance.

NOTES:

- 1 Refer to AS 1375 for additional information regarding safety principles for industrial appliances.
- 2 Where an Australian design standard exists for an appliance and is not called up in this Standard, the original equipment manufacturer (OEM) should ensure that the design is in accordance with that standard before installing (if there is no other relevant authority).
- 3 Refer to AS/NZS 5601.1 for installation requirements for appliances covered by this Standard.

1.1.2 Appliance exclusions

The following appliances are excluded from this Standard:

- (a) Manually operated Bunsen type burners.
- (b) Simple atmospheric burners and simple forced draught burners not exceeding 1 GJ/h that are not fitted into a combustion chamber and burn in an open, well-ventilated space under the control of an operator.
NOTE: Refer to AS 1668.2 and AS/NZS 5601.1 for guidance on determining if a space is well ventilated.
- (c) Petroleum, petrochemical and natural gas industries flares and associated ignition systems for general refinery and petrochemical service in accordance with ISO 25457 and ISO 23251.
- (d) Petroleum and natural gas industries pressure-relieving and depressurizing systems in accordance with ISO 23251.
- (e) Engines other than stationary engines.
- (f) Refrigeration systems that utilize gas as a refrigerant.
- (g) Any vaporizing liquid fuel burners (refer to AS 1375).

NOTE: For regulatory requirements for excluded appliances and burners, see Clause 1.2.1.