AS 3814:2015

Industrial and commercial gas-fired appliances

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The following are represented on Committee AG-011:

- 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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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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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—2009, *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 should not be regarded as a design specification or as an instruction manual—it has been prepared with due regard 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 hazards, and explosions 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 been further 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. To this end, the original equipment manufacturer has been given a wide definition in this revision.

The main features of this revision are the following:

(1) 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.

(2) The section on programmable electronic systems has been extensively revised to align it more appropriately with AS 61508 the related application Standards, AS IEC 61511 and AS 62061.

(3) An informative Appendix N on the guidance for verifying that an appliance meets the safety requirements and/or measures in accordance with this Standard.

(4) Included is an informative Appendix L for the review of PES designs by way of a checklist.

(5) The robust nature of gas engines has been reflected in the revision of Section 5.8 and the uncertainties relating to applicability of many other sections of this Standard to gas engines have been removed.

(6) In line with other international standards, the concept of a gas turbine purge credit has been introduced to enable designers and operators to establish and maintain a ‘purged’ condition for heat recovery steam generators (HRSGs) for an extended period of time between restarts.

The user should be aware that in many jurisdictions in Australia, this Standard is deemed as a ‘prescribed or preferred standard’, to which compliance is mandatory. Although Australian and New Zealand standards mostly do not do so, all the Australian and New Zealand Technical Regulators agree that this Standard should include appropriate requirements for particular components to be certified by a recognized third party assessment body.

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

S E C T I O N 1 S C O P E A N D G E N E R A L

1.1 SCOPE

1.1.1 General

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

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

NOTES:

1 Additional information regarding safety principles for industrial appliances is given in AS 1375.

2 Where an Australian design standard exists for an appliance and is not called up in this Standard, the OEM should confirm compliance to that Standard before installing (if no other authority exists).

This Standard does not cover all the requirements for the safety of the process carried out in the appliance. Other statutory and regulatory requirements might 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 comply with these requirements.

Installation requirements for appliances covered by this Standard are detailed in AS/NZS 5601.1.

1.1.2 Exclusions from Standard

The following appliances are excluded from this Standard:

(a) Manually operated bunsen type burners.

(b) Simple atmospheric burners that are not fitted into a combustion chamber and burn in an open ventilated space under the control of an operator.

(c) Petroleum, petrochemical and natural gas industries flares for general refinery and petrochemical service complying with ISO 25457 and ISO 23251.

(d) Petroleum and natural gas industries pressure-relieving and depressurizing systems complying 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).