Australian Standard®

Automatic oil and gas burners—Mechanical draught

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... NSC 4530]

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The following interests are represented on Committee ME/21:

Australian Gas Association

Australian Institute of Energy

Australian Institute of Petroleum Limited

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Department of Labour and Industry, Victoria

Department of Mines and Energy, Northern Territory

Department of Transport and Construction

Heating and Cooling Industry Association of Victoria

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PREFACE

This edition of this standard was prepared by the Association's Committee on Industrial Fuel-fired Equipment to supersede AS 1853—1976, Rules for the Design and Construction of Single Automatic Oil and Gas Burners and Their Application to Boilers.

The reference standard used by earlier boiler codes had been a section of AS CB5 which gave basic rules for oil-firing. This was replaced in 1973 by AS 1375, SAA Industrial Fuel Fired Appliances Code, which became the basic standard for the entire range of industrial oil-fired or gas-fired equipment. While that standard covered the general case very well, of necessity it dealt with broad principles; therefore, it was decided that a specialist standard was needed, to detail the specific requirements for burner systems on small and medium boilers of the type that usually operate automatically.

It was found as drafting proceeded, that the resulting standard fell naturally into two parts, one being a technical specification for automatic burners which would incorporate the best technology currently available, the second being how to apply such a burner to the boilers in question. It was recognized at the time that the automatic burner being described was suitable for a wider field of applications than boilers, but time did not permit the possibilities to be explored and developed, so AS 185—1976 had a basic orientation towards boilers.

Subsequently an additional need arose for a control system having a high level of sophistication, to cater for a class of boilers that had beome known as 'unattended'. This development caused a reassessment of subject boundaries and committee responsibilities, with the result that the two subjects of an automatic burner specification on the one hand and boiler management and control systems on the other were separated, the former to remain with the Committee on Industrial Fuel-fired Equipment, the latter being transferred to the Committee on Boilers and Unfired Pressure Vessels.

Thus, this edition is purely a specification for a high quality automatic burner for industrial use, be it for a boiler, furnace, oven or any similar combustion application. In effect, it describes how the basic burner control functions prescribed in AS 1375 may be carried out automatically. Amongst other things, it requires of the burner an ability to accept certain control or shutdown signals from the appliance to which it is attached, but the manner in which those signals are generated by the appliance or boiler is a matter for other standards.

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

(a) Adoption by a Statutory Authority having jurisdiction.

(b) Adoption by a purchaser as a required standard of construction when placing a contract.

(c) Adoption when a supplier or contractor states that equipment is in accordance with it.

Adoption by a Statutory Authority would probably occur indirectly, e.g. it might be referred to by AS 1375 or by AS 1200, SAA Boiler Code, each of which would itself be adopted directly by an Authority. In any case, the standard may need to be read in conjunction with, but will not take a precedence over, any statutory regulations that may be applicable in the area of installation.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
AUTOMATIC OIL AND GAS BURNERS—MECHANICAL DRAUGHT

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard sets out requirements for the design, construction, and control functions of automatic burners which are—

(a) for use on equipment that is generally industrial or commercial in nature, i.e. boilers, ovens, furnaces, or the like;

(b) for use with gas or liquid fuels, being either single fuel burners, or burners in which differing fuels may be burned either simultaneously or alternatively;

(c) designed so that some or all of the air for combustion is provided by mechanical means, i.e. natural draught burners such as atmospheric gas burners or vaporizing oil burners are excluded; and

(d) for use either as single burners or as part of a multiple burner installation.

NOTES:

1. Application standards such as AS 1375 set particular conditions for burners used in multiple sets.
2. Although this standard is written on the basis of conventional oil and gas fuels, it is recognized that applications exist in which less common combustible materials need to be used as a fuel. This standard is intended to cover these applications, but it is necessary to pay particular attention to the individual properties of any such fuel, specially its effect on materials or personnel.

1.2 APPLICATION. This standard is intended for adoption by reference by another standard, or some person or authority, for specific nominated applications.

NOTES:

1. When a burner is applied to a particular appliance, an interchange of signals between the management systems of burner and the appliance is necessary to ensure correct and safe operation in both normal and emergency conditions.
   When reference is made to this standard, it should be understood that the burner management system can receive and act only on three types of command signal as follows:
   (a) normal automatic start up.
   (b) shut down and stand by until a normal restart is required or permitted.
   (c) shut down and lockout.
   A need to initiate burner shutdown can arise from one of only two broad types of event, i.e. one that is normal or one that is abnormal. Whether normal or abnormal only two types of reaction are available, for each of which there is a provision to receive a signal. One will shut down to standby and permit restart when cleared to do so, and this signal might be generated by normal demand needs or by a mild 'incorrect condition' or a precautionary need. The other provision activates the 'shut down and lock out' procedure, which may be partial or total.
   It is therefore necessary to classify abnormal occurrences on the appliance according to whether lockout is justified, or normal restart is permitted when the abnormality has cleared. (See Clauses 1.6.28, 2.1.1(d) (iii) (iv) and (v), 2.9.12, 2.9.13, and Appendix F, Paragraph F3(k).)

1.3 NEW DESIGNS AND INNOVATIONS. Notwithstanding the specific requirements of this standard, any novel materials, designs, techniques, methods of assembly, etc, which give equivalent results to those specified may be considered for acceptability. Such cases should be referred to SAA Committee ME/21, Industrial Fuel-fired Equipment, for an opinion as to compliance with the spirit and intent of this standard.

1.4 INTERPRETATIONS. Questions concerning the meaning, application, or effect of any part of this standard may be referred to SAA Committee ME/21, Industrial Fuel-fired Equipment, for interpretation. The authority of this committee is limited to matters of interpretation, and it will not adjudicate in disputes.

1.5 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1200 SAA Boiler Code

AS 1375 SAA Industrial Fuel-fired Appliance Code

AS 1940 SAA Flammable and Combustible Liquids Code

BS 799 Oil Burning Equipment
Part 3—Automatic and Semi-automatic Atomizing Burners Up to 36 litres per hour and Associated Equipment
Part 4—Atomizing Burners Over 36 litres/hour and Associated Equipment for Single and Multi-burner Installations

1.6 DEFINITIONS. For the purpose of this standard, the following definitions apply:

1.6.1 Approved, approval—with the approval of, acceptable to, and complying with the prescribed standards of the Authority.

1.6.2 Authority—the authority having statutory (legal) control in a particular circumstance.

1.6.3 Automatic burner—a burner that once it has been initially put into commission is capable of providing all the necessary functions without the intervention of operating personnel.

1.6.4 Boiler—an appliance that is defined as a boiler in AS 1200.

1.6.5 Burner management system—a system that controls the operation of a burner by flame supervision devices, limit devices and operational controls.