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Australian Standard 1825—1982

ELECTRICAL EQUIPMENT FOR EXPLOSIVE ATMOSPHERES

PRESSURIZED ENCLOSURE—TYPE OF PROTECTION p

STANDARDS ASSOCIATION OF AUSTRALIA
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The following interests were represented on the committee responsible for the preparation of this standard:

Australian Coal Association

Australian Electrical and Electronics Manufacturers Association

Australian Institute of Petroleum

Confederation of Australian Industry

Department of Industrial Relations, N.S.W.

Department of Industry and Commerce

Department of Mineral Resources, N.S.W.

Department of Minerals and Energy, Vic.

Department of Mines, Qld

Electrical Contractors Associations of Australia

Electricity Supply Association of Australia

Independent testing interests

Insurance Council of Australia

State electricity regulatory authorities

AUSTRALIAN STANDARD

ELECTRICAL EQUIPMENT FOR EXPLOSIVE ATMOSPHERES

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PREFACE

This edition of this standard was prepared by the Association's Committee on Electrical Equipment in Hazardous Locations to supersede AS 1825—1976. It is intended for the guidance of manufacturers, users, statutory authorities and associated interests, and for use with the SAA Wiring Rules (AS 3000) and relevant mining regulations.

In its terminology, definitions and general treatment of the subject this standard is similar to corresponding draft recommendations issued by the International Electrotechnical Commission (IEC) and acknowledgement is made of the assistance received from this source.

The following are the major changes in this edition:

(a) Reference is made to AS 2380, Part 1 for grouping of apparatus, temperature classification and marking.

(b) The maximum pressure limit has been raised from 200 Pa to 10 kPa.

(c) The mechanical pressure test has now to be conducted at 1.25 times the maximum operating pressure.

(d) The maximum operating pressure must be marked on the nameplate.

(e) Compliance with AS 3100 is required for pressurized equipment.

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FOREWORD

The classification of hazardous areas is dealt with in AS 2430, Parts 1 and 2. Part 1 applies to explosive gas atmospheres and recognizes the following zones:

Zone 0—an area in which an explosive gas atmosphere is present continuously, or is expected to be present for long periods, or for short periods which occur with high frequency.

Zone 1—an area in which an explosive gas atmosphere can be expected to occur periodically or occasionally during normal operation.

Zone 2—an area in which an explosive gas atmosphere is not expected to occur in normal operation and if it occurs is likely to be present only infrequently and for short duration.

An enclosure complying with this standard may be suitable for installation in a Zone 1 or Zone 2 area, depending upon the technique employed.

An enclosure complying with this standard may be suitable for use in a Zone 0 area provided that the enclosure is certified by a recognized certifying body and approved by the Inspecting Authority.

This standard is confined to the enclosure itself and to the fittings directly associated with the enclosure that are concerned with pressurization. Careful consideration must be given to the auxiliary apparatus needed for the supply of the pressurizing medium to the enclosure.

Guidance on the pressurizing medium and other matters not directly connected with the specification of the enclosure itself is given in Appendix A.

The fundamental principles in the design of a pressurized system are—

(a) that a minimum pressure of 50 Pa above the atmosphere surrounding the enclosure can be maintained prior to and during the operation of the electrical equipment which is enclosed;

(b) that on admission of the pressurizing medium the atmosphere then existing within the enclosure is not explosive;

(c) that electrical protection pressure-measuring devices are installed that will operate alarm and trip devices whenever the pressure within the enclosed system falls below the minimum or exceeds the maximum permitted; and

(d) that conditions of control are provided to obtain the desired degree of safety.

It should be noted that temperature limits in relation to the ignition temperature apply to any equipment referred to herein, equally with those applicable for flameproof equipment, under similar conditions.

It must be recognized that safe use of electrical equipment in flammable or explosive gas atmospheres may depend on many factors besides the use of a pressurized enclosure, including for example the following:

(i) The safe application of a pressurized enclosure depends, not only on initial design, but also on proper installation, operation and maintenance. Strict attention to design, ratings and provisions of adequate automatic protective devices is essential.

(ii) The gases acetylene, ethyl nitrite and water gas are of such incendiveness that the use of flameproof equipment alone does not provide adequate protection where these gases are present. Emphasis must therefore be on techniques for ensuring safety without recourse to flameproof equipment. The pressurization of electrical equipment as described in this standard provides one such method of protection.

(iii) There are means other than pressurized enclosure whereby an explosion hazard may be controlled, such as the use of adequate and reliable ventilation of the hazardous location, segregation of electrical equipment, use of intrinsically safe apparatus and circuits and other approved specialized safeguards. While some of these factors are mentioned in the rules dealing with hazardous locations in the SAA Wiring rules, such installations require special and expert attention.

For approval purposes it is sufficient for individual parts to comply with this standard. The system as a whole must also be proven safe and satisfactory for the purpose intended in the industry concerned, by the manufacturer and by the appropriate statutory authorities. (See Appendix A.)

As the condition of pressurized equipment depends on the maintenance of the enclosure in its designed condition, it is essential that due attention is paid to this condition at all times, and that corrosion, deformation, and wear of components are remedied before any design features of the enclosure no longer comply with the conditions laid down in the standard. The maintenance and the use of the pressurized equipment so that its safety will not be impaired is the responsibility of the user.

The gas or vapour excluding principle of protection used in this standard is similar to that used in the related standard AS 1021 which specifies requirements for purged enclosure equipment.