Australian Standard®

Electrical equipment for explosive atmospheres — Explosion-protection techniques

Part 2: Flameproof enclosure d

This Australian Standard was prepared by Committee EL/14, Electrical Equipment in Hazardous Areas. It was approved on behalf of the Council of Standards Australia on 23 October 1991 and published on 16 December 1991.

The following interests are represented on Committee EL/14:

Australian Electrical and Electronic Manufacturers Association

Australian Institute of Petroleum

Confederation of Australian Industry

Department of Mineral Resources, N.S.W.

Department of Resource Industries, Qld

Electrical Contractors Association of Australia

Electricity Supply Associations of Australia

Institute of Instrumentation and Control

Insurance Council of Australia

The Workcover Authority, N.S.W

Regulatory authorities (electrical)

Testing interests.

Additional interests participating in preparation of Standard:

University of New South Wales.

Australian Standard®

Electrical equipment for explosive atmospheres — Explosion-protection techniques

Part 2: Flameproof enclosure d

First published in part as AS C98-1961.
Second edition 1970.
Revised and redesignated AS 2480-1981.
AS C99 first published 1970.
Revised and redesignated AS 2034-1977.
Second edition 1982.
AS 2480-1981 and AS 2034-1982 revised, amalgamated and issued as AS 2480-1986.
Revised and redesignated AS 2380.2-1991.

Incorporating:
Amdt 1-1992

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 7179 9

PREFACE

This Standard was prepared by the Standards Australia Committee on Electrical Equipment in Hazardous Areas, to supersede AS 2480—1986, *Electrical equipment for explosive atmospheres — Flameproof enclosure — Type of protection d.* This Standard is intended for the guidance of manufacturers, users, statutory authorities and associated interests. It is Part 2 of a series of Standards dealing with the explosion-protection of electrical equipment intended for use in hazardous areas.

In its terminology, definitions and general treatment of the subject, this Standard is similar to the following Standards issued by the International Electrotechnical Commission and the European Committee for Electrotechnical Standardization.

IEC 79-1 *Electrical apparatus for explosive gas atmospheres*
Part 1: *Construction and verification test of flameproof enclosures of electrical apparatus*

EN 50 018 *Electrical apparatus for potentially explosive atmospheres; flameproof enclosure d*

Acknowledgment is made of the assistance received from these sources.

The major changes to this edition are as follows:

(a) General requirements are covered by reference to AS 2380.1, *Electrical equipment for explosive atmospheres — Explosion-protection techniques*, Part 1: *General requirements*

(b) The average surface roughness of joints is not to exceed 6.3 μm.

(c) Measurement of minimum width of joints and maximum gap have been clarified.

(d) Amended requirements for plugs and socket-outlets have been included.

(e) Tests to determine explosion pressure and the non-transmission of an internal ignition have been altered to align with the current IEC requirements.

(f) Provisions for testing to acetylene have been included.

(g) Requirements for breathing and draining devices as well as non-metallic enclosures, and parts of, have been included as informative appendices.

CONTENTS

Page

STANDARDS AUSTRALIA

Australian Standard

Electrical equipment for explosive atmospheres—Explosion-protection techniques

Part 2: Flameproof enclosure d

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies requirements for the flameproof enclosure of electrical equipment, type of protection d, intended for use in hazardous areas.

The Standard provides for the grouping of enclosures according to the dimensions of the gaps between joint surfaces, and an indication is given of the explosive gas atmosphere for which each group is appropriate. Some additional requirements may be necessary for non-metallic materials and these are left to the discretion of the testing authority (see Appendix C).

This Standard does not apply to enclosures kept charged with air or other non-flammable gas so as to prevent the entry of flammable gas, or to enclosures containing hydrocarbon oil and parts of equipment into which gaseous products from the oil may enter.

Electrical equipment with type of protection d shall be designed for operation within the ambient temperature range specified in AS 2380.1. For ambient temperatures below -20°C, stronger enclosures may be required due to the higher explosion pressures generated at low temperatures and the possibility of brittle failure of enclosure materials. For ambient temperatures above 60°C, it may be necessary to use smaller joint gaps because the maximum safe gap tends to decrease with an increase in ambient temperature.

The specific requirements in this Standard are additional to the general requirements in AS 2380.1, except for Clause 2.11.2 which does not apply.

1.2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS
1146 Method for impact test on plastics
1146.2 Part 2: Charpy impact resistance

1299 Electrical equipment for coal mines—Flameproof restrained plugs and receptacles

1300 Electrical equipment for coal mines—Bolted flameproof cable coupling devices

1721 General purpose metric screw threads

1722 Pipe threads of Whitworth form
1722.1 Part 1: Sealing pipe threads

1828 Electrical equipment for explosive atmospheres—Cable glands

2052 Metallic conduits and fittings

2380 Electrical equipment for explosive atmospheres—Explosion-protection techniques
2380.1 Part 1: General requirements
2380.6 Part 6: Increased safety

2536 Surface texture

3000 SAA Wiring Rules

ISO
1210 Determination of flammability characteristics of plastics in the form of small specimens in contact with a small flame

1817 Rubber, vulcanized—Determination of the effect of liquids

2738 Permeable sintered metal materials—Determination of density, oil content, and open porosity

4003 Permeable sintered metal materials—Determination of bubble test pore size

4022 Permeable sintered metal materials—Determination of fluid permeability

4892 Plastics—Methods of exposure to laboratory light sources