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Australian Standard 1299—1981

FLAMEPROOF RESTRAINED PLUGS AND RECEPTACLES FOR USE IN COAL MINES

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

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THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL ORGANIZATIONS and departments were officially represented on the committee entrusted with the preparation of this standard:

Association of Mining Electrical and Mechanical Engineers, Australia

Australian Chamber of Commerce

Australian Coal Association

Australian Electrical and Electronic Manufacturers Association

Confederation of Australian Industry

Department of Mineral Resources, N.S.W.

Department of Mines, Queensland

Joint Coal Board

Queensland Confederation of Industry

State Energy Commission of Western Australia

State Mines Control Authority, N.S.W.

University of New South Wales

University of Queensland

University of Sydney

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AUSTRALIAN STANDARD

FLAMEPROOF RESTRAINED PLUGS AND RECEPTACLES FOR USE IN COAL MINES

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PREFACE

This edition of this standard was prepared by the Association's Committee on Electrical Equipment in Coal Mines. It is intended for use in conjunction with mining regulations, and for the guidance of manufacturers, users, and statutory authorities concerned with the operation of electrical equipment in hazardous gas atmospheres.

Provision is now made for shuttle car plugs and receptacles, and a new 60 A restrained plug and receptacle, all in 660 V and 1100 V configurations. The existing 60 A and 425 A plugs and receptacles have been deleted and changes have been made to the dimensions of existing drawings to ensure interchangeability of plugs and receptacles of different makes. Fixing dimensions of receptacles have also been standardized.

Acknowledgement is made to Cable Makers Australia Pty Ltd for providing the working drawings reproduced in the standard. It should be noted that as reproduced herein Figs 3 to 10 are approximately to the same scale.

This standard requires reference to the following Australian standards:—

AS 1147	Plastics Insulating Materials of Mouldings for Cable Connecting Devices for Use in Coal Mines
AS 1802	Trailing Cables for Mining Purposes (Including Underground Coal Mines, Metalliferous Mines, Open-cut Mines, Quarries and Dredges)
AS 1828	Cable Glands for Explosive Gas Atmospheres
AS 1852	International Electrotechnical Vocabulary 1852(441)—Switchgear and Controlgear
AS 1856	Electroplated Coatings of Silver for Engineering Applications
AS 3147	Approval and Test Specification for PVC Insulated Electric Cables and Flexible Cables for Working Voltages of 0.6/1.0 kV
AS C98	Flameproof Enclosure of Electrical Equipment for Explosive Atmospheres
AS K185	Colours for Specific Purposes

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

for

FLAMEPROOF RESTRAINED PLUGS AND RECEPTACLES FOR USE IN COAL MINES

1 SCOPE. This standard specifies the dimensional and test requirements for flameproof restrained type plugs and receptacles, incorporating three power contacts, one auxiliary contact and scraping earth contact, intended for use with mining apparatus. Provision is also made for plug coupling units which enable lengths of trailing cable to be coupled together. The standard is designed to ensure interchangeability of flameproof plugs and receptacles of different makes.

The standard includes some electrical and mechanical requirements, including the provision of earthed phase barriers for protection against inter-phase faults, but does *not* purport to provide a fully detailed design.

The term 'receptacle' used in this standard is synonymous with the term 'socket' in AS 1852. The term 'receptacle' has been chosen to avoid confusion with the individual sockets within the plug.

A typical plug and receptacle assembly is shown in Fig. 1 and a typical plug coupling unit is shown in Fig. 2.

The standard provides for plug and receptacle discrimination, i.e. an arrangement whereby fitting of plugs and receptacles of different rated voltages is physically prevented from engagement.

NOTE: Attention is drawn to Appendix A, which lists information which should be supplied by the purchaser with his enquiry or order.

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

2.1 Authority—the relevant Statutory Authority responsible for the implementation of Government regulations applying to coal mines in each of the States of Australia.

2.2 Cable gland—a device to secure the end of a cable, by means appropriate to the type of cable, including provision for the making of electrical connections to the metallic covering of the cable and to the metallic sheath if present.

2.3 Contact pin—a conducting member, rigid or resilient, intended to be inserted in a socket contact of suitable form so as to make electrical contact.

2.4 Contact socket—a conducting member, rigid or resilient, intended to receive a suitable pin so as to make electrical contact.

2.5 Flameproof receptacle—that portion of a plug and receptacle having contacts consisting of pins and which is designed to receive the plug.

2.6 Flameproof restrained cable reel plug and receptacle—a special form of restrained plug and receptacle shaped to suit a right-angled entry into, and the periphery of, a cable reel drum.

2.7 Flameproof restrained coupling unit—an assembly incorporating two receptacle entries, providing for the insertion and engagement of plugs for connecting two lengths of trailing cable.

2.8 Flameproof plug—that portion of a plug and receptacle having contacts consisting of sockets and which is attached to a trailing cable and is designed for engagement within the receptacle.

2.9 Flameproof restrained plug and receptacle—a device consisting of two portions having metallic contacts and arranged to engage and disengage with each other and also to be retained by means of a manually operated device. When their parts are properly assembled together with any associated equipment and cables, they comply with the relevant requirements of AS C98.

2.10 Phase barrier—a conductive barrier which is electrically connected to earth, and is secured in the contact insulation between the main contacts in both the plug and receptacle for the purpose of preventing inter-phase faults and of enabling current to be limited in a phase-to-earth fault.

2.11 Right hand cable reel receptacle—one that is fitted to an opposite standard drive shuttle car. (See Figs 5 and 6).

2.12 Left hand cable reel receptacle—one that is fitted to a standard drive shuttle car. (See Figs 5 and 6.)

2.13 Scraping earth contact—a method employed to ensure electrical continuity of the earthing circuit between a plug and receptacle.

2.14 Trailing cable—a cable having stranded or bunched conductors, insulation, filling reinforcement or protective covering and specially designed to provide a flexible electrical connection between portable or mobile equipment and a fixed point or points.

2.15 Terminal—any device intended for the termination of a cable core conductor.

3 RATINGS AND COLOUR CODING.

3.1 Voltage. The standard voltages shall be 660 V and 1100 V.

3.2 Current. The standard currents shall be 60 A, 125 A, 150 A, and 300 A.

3.3 Colour Coding. The bodies of plugs and receptacles shall be colour coded as follows:

(a) 660 V ..... Orange to No 557 of AS K185.

(b) 1100 V .....Blue to No 107 of AS K185.

4 SERVICE CONDITIONS.

4.1 General. Cable-coupling devices in accordance with this standard shall be suitable within the limits of their ratings for installation where the service conditions are not more severe than those stated in Clauses 4.2 to 4.4.