Australian Standard®

Gaseous fire extinguishing systems

Part 3: Carbon dioxide systems

This Australian Standard was prepared by Committee FP/11, Fire Extinguishing Systems. It was approved on behalf of the Council of Standards Australia on 3 April 1995 and published on 5 June 1995.

The following interests are represented on Committee FP/11:

Australian Chamber of Commerce and Industry

Australian Construction Services—Department of the Arts and Administrative Services

Australian Fire Authorities Council

Australian Fire Protection Association

Commonwealth Fire Board

Department of Defence, Australia

Fire Protection Industry Association of Australia

Fire Trainers Association of Australia

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This Standard was issued in draft form for comment as DR 91250.

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PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140
ISBN 0 7262 9791 7

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee FP/11 on Fire Extinguishing Systems.

This standard is the result of a consensus among representatives on the Joint Committee to produce it as an Australian Standard.

In order to maintain a compatible format in each Part of AS 4214, *Gaseous fire extinguishing systems*, the Section numbers have been maintained throughout the suite whether or not they are applicable to the particular Part.

The objective of this Standard is to provide the users of carbon dioxide systems specific requirements for the control of fires of Classes A, B or C and E type. It does not cover the design of explosion suppression systems.

It is essential that fire extinguishing equipment be carefully maintained to ensure instant readiness when required. The importance of maintenance cannot be too highly emphasized.

AS 1851.12, *Maintenance of fire protection equipment*, Part 12, *Gaseous fire extinguishing systems*, sets out requirements for the regular maintenance of gaseous fire extinguishing systems, designed and installed in accordance with the AS 4214.1, *Gaseous fire extinguishing systems*, Part 1: *General requirements* and the part of the standard appropriate to the extinguishant used. Regular maintenance includes inspection and test procedures.

The Committee was guided substantially by developments of ISO Technical Committee TC 21, Equipment for Fire Protection and Fire Fighting, Subcommittee SC 5, Fixed Fire Extinguishing Systems, which is preparing an International Standard for carbon dioxide total gas flooding systems.

Some requirements selected from ISO 6183, *Fire protection equipment*: *Carbon dioxide extinguishing systems for use on premises; design and installation*, have been supplemented by design criteria. The major deviation from the ISO approach is that all pressures in this Standard are given in pascals to maintain uniformity with the International System of Units (SI). For information on SI units, reference should be made to AS 1000, *The International System of units (SI) and its application.*

In the preparation of this Standard, account has also been taken of NFPA 12, *Carbon dioxide fire extinguishing systems*, and BS 5306, *Fire extinguishing installations and equipment on premises*, Part 4: *Specification for carbon dioxide systems*.

This Standard has been prepared to meet the need for the dissemination of information on established system design. Its requirements represent the best technical data known at the time of preparation but, since a wide field is covered, it has been impracticable to consider every possible factor or circumstance that might affect implementation.

Carbon dioxide containers manufactured for use in Australia are required to meet the design parameters as set out in AS 2030.1, *The approval, filling, inspection, testing and maintenance of cylinders for the storage and transport of compressed gases (known as the SAA Gas Cylinders Code)*, Part 1: *Cylinders for compressed gases other than acetylene*.

Attention is drawn to AS 2030.1 as it requires cylinders to be designed for the pressure developed at 65°C. This is some 10°C higher than that nominated in overseas codes. Accordingly, this aspect should be kept in mind for any imported carbon dioxide containers.

It is a basic assumption in all technical Standards work that each Standard be used only by persons competent in the field of application with which it deals. This is of particular importance in fire protection work. Accordingly, it is emphasized that the design requirements in this Standard are to be interpreted only by trained and experienced designers.

This Standard does not include specific requirements for carbon dioxide systems for marine applications. However, the method of calculation in this Standard may be of some assistance in the design of such systems.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

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First published as AS 4214.3— 1995.

Incorporating:
Amdt 1—1997

FOREWORD

This Standard is intended for use by those concerned with purchasing, designing, installing, testing, inspecting, approving, and operating carbon dioxide (CO_2) total flooding and local application extinguishing systems, in order that such equipment will function as intended throughout its life.

It is important that the fire protection of a building or plant be considered as a whole. Carbon dioxide systems form only a part, though an important part, of the available fire protection facilities. However, it should not be assumed that their adoption necessarily removes the need to consider supplementary measures, such as the provision of portable fire extinguishers or mobile appliances for first aid or emergency use, or measures to deal with special hazards.

Carbon dioxide is recognized as effective for extinguishing Class A, Class B and Class C fires where electrical risks are present. However, it should not be forgotten in the planning of comprehensive schemes that there may be hazards for which this technique is not suitable, or that, in certain circumstances or situations, there may be dangers in its use, requiring special precautions.

The discharge of carbon dioxide creates a dangerous oxygen deficiency which may result in unconsciousness and subsequent suffocation.

Advice on the above can be obtained from organizations involved with the installation of carbon dioxide total flooding systems.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard complements AS 4214.1 and sets out the requirements for carbon dioxide systems, utilizing high or refrigerated low pressure carbon dioxide as the fire extinguishant.

The carbon dioxide shall comply with the requirements of AS 4078.

General principles may well apply for other uses (e.g. maritime use). However, additional considerations may have to be taken into account which are beyond the scope of this Standard.

NOTE: A commentary on certain aspects of this Standard is given in an advisory manner in Appendix A. It relates to specific Clauses in the text identifying relative information bearing, in each instance, the Clause number and title preceded by the letter 'A', e.g. A1.5 Uses and limitations of carbon dioxide.

1.2 APPLICATION Carbon dioxide fire extinguishing systems, described as CO_2 systems hereafter, shall comply with the requirements of AS 4214.1 and the relevant Sections of this Standard. Where requirements differ this Standard takes precedence.

1.3 REFERENCED DOCUMENTS The following documents are referred to in this Standard.

AS

1020 The control of undesirable static electricity

1210 Unfired Pressure Vessels (known as the SAA Unfired Pressure Vessels Code)

1319 Safety signs for the occupational environment

1530 Methods for fire tests on building materials, components and structures

1530.1 Part 1: Combustibility test for materials

1603 Automatic fire detection and alarm systems

1603.4 Part 4: Control and indicating equipment

1603.6 Part 6: Fire alarm bells

1650 Hot dipped galvanized coatings on ferrous articles

1670 Automatic fire detection and alarm systems—System design, installation, and commissioning

1850 Portable fire extinguishers—Classification, rating and performance testing

1890 Thermally-released links

2030 The approval, filling, inspection, testing and maintenance of cylinders for the storage and transport of compressed gases (known as the SAA Gas Cylinders Code)

2030.1 Part 1: Cylinders for compressed gases other than acetylene