

AS 6183:2025



STANDARDS
Australia



Fire protection equipment — Carbon dioxide extinguishing systems for use on premises — Design and installation (ISO 6183:2022, MOD)



currently in review, click buy full version

AS 6183:2025

This Australian Standard ® was prepared by FP-011, Special Hazard Fire Protection Systems. It was approved on behalf of Standards Australia's Standards Development and Accreditation Committee on 26 February 2025.

This Standard was published on 21 March 2025.

The following are represented on Committee FP-011:

- Australasian Fire and Emergency Service Authorities Council
- Australian Chamber of Commerce and Industry
- Australian Industry Group
- CSIRO
- Engineers Australia/Society of Fire Safety
- Facility Management Association of Australia
- Fire Protection Association Australia
- National Fire Industry Association

This Standard was issued in draft form for comment as DR AS 6183:2023.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

ISBN 978 1 76175 110 3

**Fire protection equipment —
Carbon dioxide extinguishing
systems for use on premises
— Design and installation
(ISO 6183:2022, MOD)**

Originates as AS 6183—2011.
Second edition 2025.

COPYRIGHT

© ISO 2025 — All rights reserved
© Standards Australia Limited 2025

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Preface

This Standard was prepared by the Standards Australia Committee FP-011, Special Hazard Fire Protection Systems, to supersede AS 6183:2011.

The objective of this document is to specify requirements and give recommendations for the design, installation, testing, maintenance and safety of fixed carbon dioxide firefighting systems in buildings, plants or other structures.

This document is an adoption with national modifications and has been reproduced from ISO 6183:2022, *Fire protection equipment — Carbon dioxide extinguishing systems for use on premises — Design and installation*. The modifications are set out in national variations boxes which give instructions where the ISO text is to be modified for use in Australia. Due to ISO copyright policy it is not possible to directly modify the ISO content.

As this document has been reproduced from an international document, a full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

Contents

Preface	ii
Foreword	vi
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Use and limitations	5
4.1 General	5
4.2 Uses for carbon dioxide systems	5
4.3 Limitations for carbon dioxide systems	6
4.4 Temperature limitations	6
5 Safety	6
5.1 Hazard to personnel	6
5.2 Safety precautions	6
5.2.1 Normally occupied and normally unoccupied areas	6
5.2.2 Warning notices for occupiable areas	8
5.2.3 Warning notices for unoccupiable areas	10
5.3 Electrical hazards	11
5.4 Electrical earthing	12
5.5 Electrostatic discharge	12
6 System design	13
6.1 General	13
6.1.1 Introduction	13
6.1.2 Specifications	13
6.1.3 Working documents	13
6.2 Carbon dioxide supply	13
6.2.1 Quality	13
6.2.2 Quantity	14
6.2.3 Container arrangement	15
6.2.4 Storage containers	16
6.3 Distribution	18
6.3.1 General	18
6.3.2 Piping	19
6.3.3 Fittings	19
6.3.4 Pipe and valve support	20
6.3.5 Valves	20
6.3.6 Nozzles	21
6.4 Enclosures (total flooding)	22
6.4.1 Structural strength	22
6.4.2 Loss through openings	22
6.4.3 Ventilation systems	22
6.5 Detection, actuation and control systems	22
6.5.1 General	22
6.5.2 Shut-down of plant and equipment	23
6.5.3 Automatic detection	23
6.5.4 Operating devices	23
6.5.5 Control equipment	25
6.5.6 Audible alarms and visual indicators	26
6.6 Local control (LC) and local control stations (LCS)	28
7 Carbon dioxide flow and concentration calculations	28
7.1 General	28

7.2	System flow calculations.....	29
7.2.1	General.....	29
7.2.2	Friction losses.....	29
7.2.3	Pressure drop.....	29
7.2.4	Valves and fittings.....	30
7.2.5	As-installed calculations.....	30
7.2.6	Specific requirements.....	30
7.3	Carbon dioxide concentration requirements.....	30
7.3.1	Flame extinguishment.....	30
7.3.2	Inerting.....	31
7.4	Total flooding quantity.....	31
7.4.1	General.....	31
7.4.2	Design quantity.....	31
7.4.3	K_B factor.....	32
7.5	Design of local application systems.....	35
7.5.1	General.....	35
7.5.2	Carbon dioxide requirements.....	35
7.5.3	Rate by area method.....	35
7.5.4	Rate by volume method.....	37
7.6	Duration of protection — total flooding systems.....	38
7.7	System performance.....	39
7.7.1	Discharge time.....	39
7.7.2	Extended discharge.....	39
8	Commissioning and acceptance.....	39
8.1	General.....	39
8.2	Tests.....	40
8.2.1	General.....	40
8.2.2	Enclosure check.....	40
8.2.3	Review of mechanical components.....	40
8.2.4	Review of enclosure integrity.....	41
8.2.5	Review of electrical component.....	42
8.2.6	Preliminary functional tests.....	43
8.2.7	System functional operation test.....	43
8.2.8	Remote monitoring operations (if applicable).....	43
8.2.9	Control panel primary power source.....	43
8.2.10	Completion of functional tests.....	44
8.3	Completion certificate and documentation.....	44
9	Inspection, maintenance, testing and training.....	44
9.1	General.....	44
9.2	Inspection.....	45
9.2.1	General.....	45
9.2.2	Container.....	45
9.2.3	Pipe.....	45
9.2.4	Enclosures.....	45
9.3	Maintenance.....	45
9.3.1	General.....	45
9.3.2	User's programme of inspection.....	45
9.3.3	Service schedule.....	46
9.4	Training.....	46
Appendix A	(normative) Working documents.....	47
Appendix B	(normative) Carbon dioxide system pipe and orifice size determination.....	54
Appendix C	(informative) System performance verification.....	62
Appendix D	(informative) General information on carbon dioxide.....	63
Appendix E	(informative) Examples of calculations.....	68

Bibliography.....73

Currently in preview, click buy full version

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and firefighting*, Subcommittee SC 8, *Gaseous media and firefighting systems using gas*.

This third edition cancels and replaces the second edition (ISO 6183:2009), which has been technically revised. It also incorporates the amendment(s) ISO 6183:2009/Amd. 1:2017 and ISO 6183:2009/Amd. 2:2019.

The main changes are as follows:

- guidance on container storage has been updated;
- alerts when removing actuators have been added;
- a commissioning check list has been included in [Annex A](#);
- pictorial examples have been added to [Annex C](#).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document is intended for use by those concerned with purchasing, designing, installing, testing, inspecting, approving, operating and maintaining carbon dioxide (CO₂) extinguishing systems.

This document applies only to carbon dioxide fixed fire-extinguishing systems in buildings and other premises on land. Although the general principles can apply to other uses (e.g. maritime use), for these other uses, it is likely that additional considerations will have to be taken into account and the application of the requirements given in this document is therefore unlikely to be fully satisfactory. General information about carbon dioxide as an extinguishing medium is given in [Annex D](#). This can be useful background information for those unfamiliar with the characteristics of this medium.

It has been assumed in the preparation of this document that the execution of its provisions will be entrusted to those persons appropriately qualified and experienced in the specification, design, installation, testing, approval, inspection, operation and maintenance of systems and equipment, for whose guidance it has been prepared, and who can be expected to exercise a duty of care to avoid the unnecessary release of carbon dioxide. New requirements to minimize the need to release carbon dioxide during testing and commissioning procedures are included in this third edition. These are linked to the inclusion of enclosure integrity testing.

Carbon dioxide has for many years been a recognized effective medium for the extinction of flammable liquid fires as well as fires in the presence of electrical and ordinary Class A hazards. Nevertheless, in the planning of comprehensive schemes, it should be remembered that there can be hazards for which this media is not suitable, and that in certain circumstances or situations there can be dangers in its use requiring special precautions.

The use of carbon dioxide is no longer recommended for total flooding of occupied areas if more appropriate extinguishing agents are available. IS 14520 provides requirements for other extinguishing agents that can be more appropriately used in these areas.

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

Advice on these matters can be obtained from the appropriate manufacturer of the carbon dioxide or the extinguishing system. Information can also be sought from the appropriate fire authority, the health and safety authorities and insurers. In addition, reference needs to be made, as appropriate, to the other national standards and statutory regulations of a given country.

It is essential that fire-fighting equipment be carefully maintained to ensure instant readiness when required. Routine maintenance is liable to be overlooked or given insufficient attention by the owner of the system. It is, however, neglected at the peril of the lives of occupants of the premises and at the risk of crippling financial loss. The importance of maintenance cannot be too highly emphasized. Inspection, preferably by a third party, should include an evaluation concluding that the extinguishing system continues to provide adequate protection for the risk (protected zones as well as state-of-the-art can change over time).

NOTES

Currently in preview, click buy full version

Australian Standard®

Fire protection equipment — Carbon dioxide extinguishing systems for use on premises — Design and installation (ISO 6183:2022, MOD)

1 Scope

This document specifies requirements and gives recommendations for the design, installation, testing, maintenance and safety of fixed carbon dioxide firefighting systems in buildings, plants or other structures. It is not applicable to extinguishing systems on ships, in aircraft, on vehicles or on mobile fire appliances, or to below-ground systems in the mining industry; nor does it apply to carbon dioxide pre-inerting systems.

Design of systems where unclosable opening(s) exceed a specified area and where the opening(s) can be subject to the effect of wind is not specified, although general guidance on the procedure to be followed in such cases is given (see [7.4.3.2](#)).

2 Normative references

NATIONAL VARIATIONS

1. After the first paragraph, *add* the following:

The Australian or Australian/New Zealand Standards listed below are modified adoptions of, or not equivalent to, the ISO normative references and are required for the application of this document. All references in the source text to those ISO normative references shall be replaced by references to the corresponding Australian or Australian/New Zealand Standards.

2. Delete “ISO 7240-2, *Fire detection and alarm systems — Part 2: Fire detection control and indicating equipment*” and *replace* with the following:

AS 1670.5, *Fire detection, warning, control and intercom systems — System design, installation and commissioning, Part 5: Special hazards system*

3. Delete “ISO 7240-23, *Fire detection and alarm systems — Part 23: Visual alarm devices*”.

4. *Add* the following to the list of references:

AS 1670.1, *Fire detection, warning, control and intercom systems — System design, installation and commissioning, Part 1: Fire*

AS 1851, *Routine service of fire protection systems and equipment*

AS 2613, *Safety devices for gas cylinders*

AS 4041, *Pressure piping*

AS 4078, *Fire protection — Fire extinguishing media — Carbon dioxide*

AS/NZS 3000, *Electrical installations (known as the Australian/New Zealand Wiring Rules)*

AS/NZS 4680, *Hot-dip galvanized (zinc) coatings on fabricated ferrous articles*

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7240-2, *Fire detection and alarm systems — Part 2: Fire detection control and indicating equipment*