

Australian Standard[®]

Automatic fire sprinkler systems

Part 1: Standard

This Australian Standard was prepared by Committee FP/4, Automatic Sprinkler Installations. It was approved on behalf of the Council of Standards Australia on 30 March 1995 and published on 5 July 1995.

The following interests are represented on Committee FP/4:

Asset Services—Department of Administrative Services
Australian Building Codes Board
Australian Chamber of Commerce and Industry
Australian Chamber of Manufactures
Australian Fire Authorities Council
Australian Fire Protection Association
Australian Water and Sewerage Authorities
Commonwealth Fire Board
CSIRO—Division of Building, Construction
Department of Defence
Fire Protection Industry Association of Australia
Institution of Engineers, Australia
Insurance Council of Australia
Master Plumbers and Mechanical Services Association of Victoria
Melbourne Water
New Zealand Fire Equipment Association
Telecom Australia
Testing Interests
The Association of Consulting Engineers, Australia

Review of Australian Standards. *To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.*

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

This Standard was issued in draft form for comment as DR 92188.

Australian Standard[®]

Automatic fire sprinkler systems
Part 1: Standard

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee FP/4 on Automatic Sprinkler Installations to supersede in part AS 2118—1988, *SAA Code for Automatic Fire Sprinkler Systems*, and is the result of a consensus among representatives on the joint committee to produce it as an Australian Standard.

The revisions to AS 2118 have included Standards Australia's requirements to keep product and installation Standards separate. When complete the series will comprise:

AS

2118 Automatic fire sprinkler systems

- Part 1: Standard
- Part 2: Wall wetting sprinklers (Drenchers)
- Part 3: Deluge
- Part 4: Residential
- Part 5: Domestic
- Part 6: Combined sprinkler and hydrant
- Part 9: Piping support and installation
- Part 10: Approval documentation

4118 Fire sprinkler systems

- Part 1.1: Components—Sprinklers and sprayers
- Part 1.2: Components—Alarm valves (wet)
- Part 1.3: Components—Water motor alarms
- Part 1.4: Components—Valve monitors
- Part 1.5: Components—Deluge and pre-action valves
- Part 1.6: Components—Stop valves and non-return valves
- Part 1.7: Components—Alarm valves (dry)
- Part 1.8: Components—Pressure reducing valves
- Part 1.9: Components—Accelerators and exhausters

Part 2.1: Piping—General

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.

© Copyright — STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE, DEFINITIONS, CLASSIFICATION AND DESIGN DATA	
1.1 SCOPE	6
1.2 NEW DESIGNS AND INNOVATIONS	6
1.3 REFERENCED DOCUMENTS	6
1.4 DEFINITIONS	6
 SECTION 2 CLASSES OF SPRINKLER SYSTEMS AND DESIGN DATA	
2.1 CLASSES OF SYSTEMS	8
2.2 CLASSIFICATION OF OCCUPANCIES	8
2.3 TYPES OF SYSTEMS	13
2.4 DESIGN DATA	19
 SECTION 3 INSTALLATION	
3.1 SPRINKLERED BUILDINGS	20
3.2 TRANSMISSION OF ALARM SIGNAL TO FIRE BRIGADE	21
3.3 LOCAL ALARM	22
3.4 SYSTEM MONITORING	22
 SECTION 4 WATER SUPPLIES	
4.1 GENERAL	23
4.2 ACCEPTABLE SOURCES OF SUPPLY	23
4.3 WATER SUPPLY GRADES	23
4.4 CONNECTIONS TO OTHER SERVICES	35
4.5 PRESSURE AND FLOW REQUIREMENTS	36
4.6 PRESSURE CONSIDERATIONS	37
4.7 MINIMUM CAPACITY OF STORED WATER SUPPLIES	37
4.8 PUMP SUCTION TANKS	37
4.9 PRIVATE WATER SUPPLIES	43
4.10 TOWN MAINS	43
4.11 PUMP INSTALLATIONS	44
4.12 PUMPSETS	45
4.13 PRESSURE TANKS	49
4.14 PROVING OF WATER SUPPLIES	51
 SECTION 5 SPACING AND LOCATION OF SPRINKLERS	
5.1 STANDARD SPACING	53
5.2 STAGGERED SPACING	53
5.3 MINIMUM DISTANCE BETWEEN SPRINKLERS	53
5.4 LOCATION OF SPRINKLERS (OTHER THAN SIDEWALL SPRINKLERS) ..	53
5.5 SPACING AND LOCATION OF SIDEWALL SPRINKLERS	58
5.6 LOCATIONS OR CONDITIONS INVOLVING SPECIAL CONSIDERATION (supplementary protection)	59
5.7 OBSTRUCTIONS BELOW SPRINKLERS	63
5.8 FILM AND TELEVISION PRODUCTION STUDIOS	64
5.9 THEATRES AND MUSIC HALLS (protection on the stage side of the proscenium wall)	64
5.10 COLD STORAGE WAREHOUSE	64

SECTION 6 SPRINKLERS, SPRAYERS AND MULTIPLE CONTROLS	
6.1	GENERAL 66
6.2	TYPES OF SPRINKLERS, SPRAYERS AND MULTIPLE CONTROLS 66
6.3	SPRINKLER K FACTORS, ORIFICE AND THREAD SIZES 67
6.4	APPLICATION OF SPRINKLER TYPES 68
6.5	TEMPERATURE RATINGS 68
6.6	COLOUR CODING 68
6.7	STOCK OF REPLACEMENT SPRINKLERS 68
6.8	ANTI-CORROSION TREATMENT OF SPRINKLERS 69
6.9	SPRINKLER GUARDS 69
6.10	ESCUTCHEON PLATE ASSEMBLIES 69
6.11	PROTECTION AGAINST FROST 69
SECTION 7 PIPING	
7.1	PIPE AND PIPE FITTING 70
7.2	HYDRAULIC TEST PRESSURE 70
7.3	PIPING IN UNSPRINKLERED BUILDINGS 70
7.4	HAZARDOUS PROCESSES AND EXPLOSION HAZARD—SPECIAL PRECAUTIONS CONCERNING PIPING AND VALVES 70
7.5	SLOPE OF PIPES FOR DRAINAGE 70
7.6	LOW LEVEL DRAINAGE 70
7.7	PIPE SIZES 71
7.8	ORIFICE PLATES 71
7.9	SUPPORT OF SPRINKLER PIPING 71
SECTION 8 VALVES AND ANCILLARY EQUIPMENT	
8.1	CONTROL ASSEMBLIES 72
8.2	STOP VALVES 72
8.3	BLOCK PLAN 73
8.4	LOCATION PLATE 73
8.5	EMERGENCY INSTRUCTION 74
8.6	NON-RETURN (BACK PRESSURE) VALVES 74
8.7	ALARM VALVES 74
8.8	PRESSURE-REDUCING VALVES 75
8.9	DELUGE AND PRE-ACTION VALVES 75
8.10	ALARM DEVICES 75
8.11	REMOTE TEST VALVES 77
8.12	PRESSURE GAUGES 78
SECTION 9 LIGHT HAZARD CLASS SYSTEMS	
9.1	DESIGN DATA 79
9.2	WATER SUPPLIES 79
9.3	SPACING OF SPRINKLERS 80
9.4	SYSTEM COMPONENTS 81
9.5	SYSTEM DRAINAGE 83
SECTION 10 ORDINARY HAZARD CLASS SYSTEMS	
10.1	DESIGN DATA 84
10.2	WATER SUPPLIES 84
10.3	SPACING OF SPRINKLERS 87
10.4	SYSTEM COMPONENTS 87
10.5	SYSTEM DRAINAGE 92

SECTION 11 HIGH HAZARD CLASS SYSTEMS

11.1 DESIGN DATA	93
11.2 WATER SUPPLIES	103
11.3 SPACING OF SPRINKLERS	106
11.4 SYSTEM COMPONENTS	107
11.5 SYSTEM DRAINAGE	109

SECTION 12 FULL HYDRAULIC CALCULATION OF SPRINKLER SYSTEMS

12.1 GENERAL	117
12.2 DESIGN REQUIREMENTS FOR DENSITY OF DISCHARGE	117
12.3 ASSUMED AREA OF OPERATION	117
12.4 SPRINKLERS IN OPERATION	117
12.5 POSITION OF ASSUMED AREA OF OPERATION	118
12.6 SHAPE OF ASSUMED AREA OF OPERATION	119
12.7 WATER SUPPLIES	120
12.8 PUMPSETS	120
12.9 CALCULATION OF PRESSURE LOSS IN PIPES	120
12.10 PRESSURE LOSSES	121
12.11 ACCURACY OF CALCULATIONS	123
12.12 MINIMUM SPRINKLER DISCHARGE PRESSURE	123
12.13 MINIMUM PIPE SIZES	123
12.14 VELOCITY LIMITATION	124
12.15 VELOCITY PRESSURE	124
12.16 IDENTIFICATION OF FULLY HYDRAULICALLY CALCULATED SYSTEMS	124

APPENDICES

A REFERENCED DOCUMENTS	138
B WIRING SYSTEMS RATING	140
C ORIFICE PLATES	142
D PIPING INTERPRETATIONS	145
E COMPLETION CERTIFICATE	148

INDEX	151
-------------	-----

RECORD OF AMENDMENTS	155
----------------------------	-----

Originated as part of CA16—1939 (endorsement of Seventh Edition of FOC Rules).
Previous edition AS 2118—1982.
Revised and redesignated in part as AS 2118.1—1995.

STANDARDS AUSTRALIA

Australian Standard

Automatic fire sprinkler systems

Part 1: Standard

SECTION 1 SCOPE, DEFINITIONS,
CLASSIFICATION AND DESIGN DATA

1.1 SCOPE This Standard specifies requirements for the installation of standard sprinkler systems in buildings.

1.2 NEW DESIGNS AND INNOVATIONS Any alternative materials, designs, methods of assembly, procedures and similar that do not comply with the specific requirements of this Standard, or are not mentioned in it, but that give the equivalent results to those specified, are not necessarily prohibited. The Committee on Automatic Sprinkler Installations can act in an advisory capacity concerning equivalent suitability, but any required approval remains the prerogative of the regulatory authority.

1.3 REFERENCED DOCUMENTS A list of referenced documents is given in Appendix A.

1.4 DEFINITIONS For the purpose of this Standard the definitions given in AS 2484.1, AS 2484.2, AS 3500.0 and that below apply.

1.4.1 Alarm valve—a non-return valve which allows the water to enter the installation and operate alarms when the installation pressure falls below the water supply pressure.

1.4.2 Approved—approved by the regulatory authority.

1.4.3 Assumed area of operation—the area, i.e. the number of sprinklers likely to operate, in a sprinklered building which is considered may be involved in a fire. The assumed area of operation is different in each hazard class.

1.4.4 Regulatory authority—a Minister of the Crown, a government department, or other public authority having power to issue regulations, orders, or other instructions in respect of any subject covered by this Standard.

NOTE: Where adoption of this Standard is not a requirement of a regulatory authority but is a requirement of a body such as a relevant insurance company or association, then that body, or their nominees such as the Insurance Council of Australia, may perform the functions of the regulatory authority for the purposes of this Standard.

1.4.5 Authorized inspector—an inspector appointed by the regulatory authority.

1.4.6 Building owner—the owner of a building or his authorized representative.

1.4.7 Fire and draught stop—a partition or bulkhead extending from end to end and top to bottom of a concealed space, installed to delay the spread of fire and constructed from imperforate materials which are non-shatterable under fire conditions.

NOTES:

- 1 Examples of acceptable fire and draught stops include the following:
 - (a) Structural features such as a reinforced beam or steel joist extending to or through the ceiling, and a brick wall extended up through the ceiling to the floor above.
 - (b) A purpose-built partition mounted on wood or steel framework, constructed of 10 mm gypsum board, 0.6 mm sheet steel or 7 mm high-density tempered hardboard.