

Australian Standard™

Fire sprinkler systems

Part 2.1: Piping—General

This Australian Standard was prepared by Committee FP-004, Automatic Sprinkler Installations. It was approved on behalf of the Council of Standards Australia on 30 January 1995.

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Australian Chamber of Commerce and Industry
Australian Chamber of Manufacturers
Australian Construction Services, Department of Administrative Services
Australian Fire Authorities Council
Australian Fire Protection Association
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STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 4118.2.1—1995

Fire sprinkler systems

Part 2.1: Piping—General

RECONFIRMATION NOTICE

Technical Committee FP-004 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

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NOTES

Australian Standard™

Fire sprinkler systems

Part 2.1: Piping—General

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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*.

This Standard incorporates Amendment No. 1 (June 2005). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

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

The revisions to AS 2118 include 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.

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STANDARDS AUSTRALIA**Australian Standard
Fire sprinkler systems****Part 2.1: Piping—General****SECTION 1 SCOPE AND GENERAL****1.1 SCOPE**

This Standard specifies requirements for piping for fire sprinkler systems.

NOTE: Illustrations in this Standard are diagrammatic only and have been chosen without prejudice.

1.2 NEW DESIGNS AND INNOVATIONS

Any alternative materials, designs, methods of assembly and procedures that do not comply with specific requirements of this Standard, or are not mentioned in it, but give equivalent results to those specified, are not necessarily prohibited. The specified approval remains the prerogative of the regulatory authority.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- 1074 Steel tubes and tubulars for ordinary service
- 1281 Cement mortar lining of steel pipes and fittings
- 1432 Copper tubes for plumbing, gas fitting and drainage applications
- 1516 The cement mortar lining of pipelines in situ
- 1518 Extruded high density polyethylene protective coating for pipes
- 1579 Arc welded steel pipes and fittings for water and waste water
- 1650 Hot-dipped galvanized coatings on ferrous articles
- 1674 Safety in welding and allied processes
- 1674.1 Part 1: Fire precautions
- 1724 Cast grey iron pressure pipes and fittings with bolted gland joints
- 1834 Material for soldering (Parts 1 and 2)
- 2118 Automatic fire sprinkler systems
- 2118.1 Part 1: Standard
- 2118.9 Part 9: Piping support and installation
- 2484 Fire—Glossary of terms
- 2484.1 Part 1: Fire tests
- 2484.2 Part 2: Fire protection and firefighting equipment
- 2544 Grey iron pressure pipes and fittings
- 2706 Numerical values—Rounding and interpretation of limiting values

AS

3500 National Plumbing and Drainage Code

3500.0 Part 0: Glossary of terms

3500.1 Part 1: Water supply

3707 Method for testing pressure cycling resistance of pipes and fittings

3862 External fusion-bonded epoxy coating for steel pipes

4041 Pressure piping

UL

1887 Fire Test of Plastic Sprinkler Pipe for Flame and Smoke Characteristics

1.4 DEFINITIONS

For the purpose of this Standard, the definitions given in AS 2118.1, AS 2484.1, AS 2484.2, AS 3500.0 and those below apply.

1.4.1 Light-wall pipe

A mild steel pipe with a nominal wall thickness less than that of medium wall thickness as specified in AS 1074.

1.4.2 Pressed locked fitting

A formed steel pipe fitting designed to ensure water tightness by means of synthetic rubber 'O-ring' seals. Mechanical compression of the entire circumference of the fitting against the pipe forms a permanent engagement of the pipe and fitting.

1.4.3 Regulatory authority

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

1.4.4 Roll grooved fitting

A formed ductile iron cast fitting designed to ensure watertightness by means of synthetic rubber gaskets. The fitting housing is in two sections and fully encloses the gasket when assembled. The housing engages around the full circumference of the roll grooved pipe end and is assembled using nuts and bolts ensuring engagement of the pipe and fitting.

1.4.5 Slotted key locked fitting

A formed ductile iron cast fitting designed to ensure watertightness by means of synthetic rubber 'O-ring' seals. The pipe when inserted into the fitting is mechanically held in place by a locking key. The locking key, when driven through the slotted keyway fitting deforms the pipe surface. The locking key can be removed to demount and re-assemble the fitting.

1.5 INTERPRETATION OF SPECIFIED LIMITING VALUES

For the purpose of assessing compliance with this Standard, the specified limiting values herein shall be interpreted in accordance with the 'rounding method' described in AS 2706, i.e., the observed or calculated value shall be rounded to the same number of figures as in the specified limiting values and then compared with the specified limiting value. For example, for specified limiting values of 2.5, 2.50, and 2.500, the observed or calculated value would be rounded respectively to the nearest 0.1, 0.01, 0.001.

SECTION 2 PIPING — STEEL

All pipes and pipe fittings shall be new and shall comply with the relevant Standards listed in Clause 1.3.

Pipes for above ground shall be at least equivalent to medium wall thickness tube complying with the requirements of—

- (a) AS 1074; or
- (b) AS 1579, subject to a minimum thickness of 4.76 mm; or
- (c) AS 4041.

Pipes above ground and downstream of the main control valve shall be at least equivalent to medium grade black steel tube in accordance with the requirements of the foregoing clause.

Pipes for below ground shall comply with the relevant Standards listed in Clause 1.3, subject to the approval of the water supply authority.

Cast iron pipes and fittings complying with AS 1724 and AS 2544 shall be coated and cement mortar lined in accordance with AS 1281 or AS 1516.

Pipes complying with AS 1074 and AS 1579, shall be subject to a minimum wall thickness of 5.3 mm.

SECTION 3 PIPING — LIGHT WALL STEEL

3.1 PIPE SPECIFICATIONS

3.1.1 General

Notwithstanding the requirements of Section 2 of this Standard, pipes with a lesser wall thickness may be used if complying with the requirements of this Section and the relevant Standards listed in Clause 1.3, and are specifically approved for use in fire protection systems.

3.1.2 Pipes for above ground

Pipes for above ground shall have a wall thickness of not less than the values shown in Table 3.1.2. Pressure rating shall be not more than the values shown in Table 3.1.2.

TABLE 3.1.2
LIGHTWALL STEEL PIPE WALL THICKNESS
AND PRESSURE RATING

Specified nominal size (DN)	Nominal wall thickness (mm)	Maximum recommended pressure	
		Test	Working
		MPa	MPa
20	1.65	17.60	11.70
25	1.65	13.90	9.25
32	1.65	10.80	7.22
40	1.65	9.46	6.31
50	1.65	7.98	5.32
65	2.11	10.50	7.01
80	2.11	9.88	6.59
100	2.11	8.79	5.86
125	2.77	9.45	6.30
150	2.77	7.98	5.32
200	3.00	6.49	4.33
250	3.00	5.19	3.46
300	3.00	4.37	2.92

NOTE: Pipe of a lesser wall thickness than shown in Table 3.1.2 may be used providing it is part of a piping system specifically approved and listed for fire protection uses (see Clause 3.4).

3.1.3 Pipes for below ground

Light wall pipes for below ground shall have a wall thickness of not less than 2.0 mm. Pressure ratings of below ground pipe shall comply with Table 3.1.2.

3.2 PIPE JOINTING

3.2.1 Welded joints

Lightwall pipes may only be joined by welding, or have components welded to them, if such joints are fabricated, welded and tested in the workshop.

Only pipes with a wall thickness greater than 2.5 mm may be joined by welding.

Pipes with a wall thickness of greater than 1.6 mm may have components welded to them.

3.2.2 Other pipe joining methods

Only mechanical pipe joining methods complying with the requirements of a relevant Standard or specifically designed and having specific approval for light wall pipe in fire protection use, shall be used.

3.2.3 Fittings

Fittings shall be dimensionally compatible with the pipe and shall only be used with a pipe for which they were specifically designed, approved and listed.

3.3 CORROSION PROTECTION

3.3.1 Pipes above ground

Where lightwall pipes are required to be installed above ground and are required by other Standards, water authorities, or are to be installed in an aggressive environment they shall be galvanized and the galvanizing shall comply with the requirements of AS 1650 (see AS 2118.9).

3.3.2 Pipes below ground

Where lightwall pipes are required to be installed below ground they shall be hot-dipped galvanized (see AS 2118.9).

3.3.3 Galvanizing

All hot-dipped galvanizing shall be in accordance with the requirements of AS 1650 subject to a minimum coating of 300 gm/m² on both internal and external surfaces.

3.3.4 Additional protection for pipes and fittings to be installed below ground

Where the installation requirements of AS 2118.9 require additional protection for pipes and fittings below ground, and that additional protection needs to be applied during the manufacturing process, such additional protection shall be—

- (a) fusion-bonded epoxy with a minimum thickness of 200 microns in accordance with the requirements of AS 3862; or
- (b) high density polyethylene plastic with a minimum thickness of 1.0 mm applied in accordance with the requirements of AS 1518; or
- (c) petrolatum based tape, of minimum thickness 1.3 mm, applied in accordance with the tape manufacturer's instructions. When applied the tape shall then be overwrapped with self-adhesive polyethylene tape, of minimum thickness 225 microns, applied in accordance with the manufacturer's instructions; or
- (d) any other method or material that can be proved to provide equivalent protection.

3.4 DEEMED TO SATISFY

Lightwall steel pipes and pipe systems that have been listed and approved for fire protection use by an internationally recognized test and approval body such as—

- (a) Factory Mutual (FM);
- (b) Underwriters Laboratories (UL);

(c) Loss Prevention Council (LPC);
or has been listed by Scientific Services Laboratory (SSL) in—
 SSL Register of Accredited Products
 Fire Protection Equipment
shall be deemed to satisfy the requirements of this Standard.