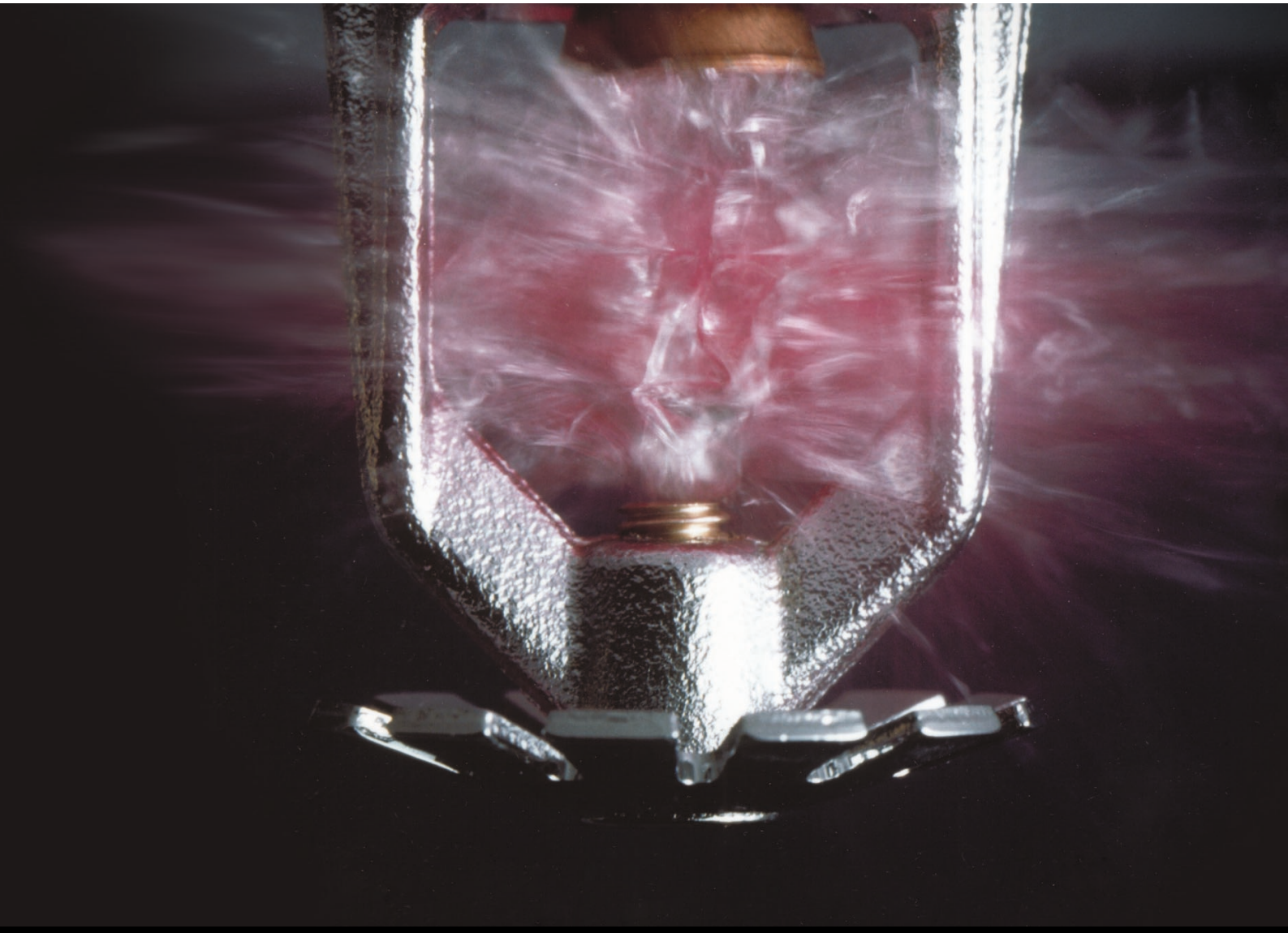
STANDARDS Australia

AS 2118.1—2006

Automatic fire sprinkler systems

Part 1: General systems

(Incorporating Amendment No. 1)



Australian STANDARD®

AS

→ General systems

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- Australian Industry Group
- CSIRO
- Consumers Federation of Australia
- Department of Defence (Australia)
- Department of Human Services (Victoria)
- Engineers Australia
- Fire Protection Association Australia
- Insurance Council of Australia
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Australian Standard®

Automatic fire sprinkler systems

Part 1: General systems

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PREFACE

This Standard was prepared by the Standards Australia Committee FP-004, Automatic Sprinkler Installations, to supersede AS 2118.1—1999, Automatic fire sprinkler systems, Part 1: General systems.

This Standard incorporates Amendment No. 1 (August 2010). 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. Minor style changes have been made (for consistency) and any spelling mistakes have been corrected in this amended edition.

The objective of this edition is to include changes that reflect recent advances in technology and to refine the content for clarity and conciseness.

Changes to Sections 3, 5, 6, 8, 10 and 12

(a) Sections 3, 5, 6, 8, 10 and 12 have been revised.

(b) Permitted exceptions in Section 3 have been reduced to reflect safety and compatibility issues.

(c) Tables for sprinkler clearances in Section 5 have been expanded to include Light Hazard spray sprinklers.

(d) Concealed space protection has been revised to take into account potential changes during the life of the building.

(e) Requirements for systems interface alarm signals have been added to Section 8 to align with current practice.

(f) The design process for ordinary hazard in Section 10 has been simplified to align with the previously adopted approach in Section 9 particularly in regard to the number of sprinklers in operation.

(g) The principles for calculations in Section 12 remain unchanged, however, the determination of the design area has been simplified. An appendix has been provided to assist the designer with hydraulic calculations in preparing the graphical representation of supply and demand curves and includes worked examples.

Changes to Section 4

The restructured Section 4 discards the principle of graded water supplies. Instead, it accepts a single town main supply meeting prescribed criteria, including the capability of simultaneously supplying specified hydrant flows, as the benchmark ‘reliable supply’.

Other acceptable sources of water supply are selected to equate to this reliability benchmark. For example, when a town main supply requires boosting by automatic pumps in order to meet the specified flow and pressure demand, two parallel-connected full capacity pumps are required, one electric motor-driven and the other diesel engine-driven.

Where a higher degree of water supply reliability is required (in the case, for example, of a high-rise apartment building), Section 4 introduces the concept of ‘dual’ water supplies. ‘Dual’ water supplies are not ‘duplicate’ supplies, but are considered to be more reliable than single supplies. This is illustrated in the case of pump suction tanks which, as single supplies, may be 2/3 capacity (if provided with adequate automatic inflow) and supply two automatic full capacity pumps, one electric motor-driven and the other diesel engine-driven.

The corresponding dual water supply arrangement would involve two-pump suction tanks (each 2/3 capacity and not requiring automatic inflow) supplying two automatic full capacity pumps, one electric motor-driven and the other diesel engine-driven.

Changes to Section 11

Section 11 has been significantly expanded based on full-scale fire test data with consequential cost reductions. It incorporates summary tables to simplify understanding of the expanded section.

Changes to Sections 7, 13 and 14

(AS 2118.8, AS 2118.9 and AS 2118.10) have been included in this Standard, consistent with consolidating the AS 2118 sprinkler suite of Standards.

Section 15

Consistent with the elements comprising design, installation and commissioning of automatic fire sprinkler systems, Section 15 addresses commissioning and acceptance testing of sprinklers and covers the hydrostatic pressure test, pre-test equipment checks, equipment tests and water supply tests. Personnel involved in the commissioning process have a commissioning check list to follow to ensure that, when complete, the system is ready for operation.

Appendix E

Appendix E, Graphic representation of hydraulic characteristics, is a new addition and sets out a series of worked examples, in step-by-step format, plotting water supply versus demand for various field conditions. This appendix should be of considerable assistance when interpreting the detailed water supply requirements set out in Sections 4 and 12.

The suite of sprinkler installation systems and components, when completed, will incorporate the current AS 4118 series and will comprise two sets, all within the AS 2118 designation, as follows:

AS 2118 Automatic fire sprinkler—Systems

Part 1: General systems requirements
Part 2: Drenchers
Part 3: Deluge
Part 4: Sprinkler systems for accommodation buildings not exceeding four storeys in height
Part 5: Home fire sprinkler systems (Supersedes ‘Domestic’)
Part 6: Combined sprinkler and hydrant systems in multistorey buildings

AS 4118 Automatic fire sprinkler—Components

Part 1.1: Sprinklers and sprayers
Part 1.2: Alarm valves (wet)
Part 1.3: Water motor alarms
Part 1.4: Valve monitors
Part 1.5: Deluge and pre-action valves
Part 1.6: Stop valves and non-return valves
Part 1.7: Alarm valves (dry)
Part 1.8: Pressure reducing valves
Part 2.1: Piping—General

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard.

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.

This Standard incorporates commentary on some of the clauses. The commentary directly follows the relevant clause, is designated by ‘C’ preceding the clause number and is printed in italics in a panel. The commentary is for information only and does not need to be followed for compliance with the Standard.

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FOREWORD

Automatic fire sprinklers provide an important level of fire safety for the occupants of buildings, and fire service personnel engaged in search, rescue and firefighting operations whilst providing an important level of fire protection for buildings and structures. In addition, the use of automatic fire sprinkler systems minimizes water consumption during firefighting operations.

In modern buildings and indeed with older buildings and any structure that is being upgraded to meet the latest requirements in fire safety, there is a need to consider other systems that impact on the function and operation of a sprinkler system. Other systems that can either interface with the sprinkler system, or be integrated with it, are automatic heat and smoke detection systems, emergency warning and intercommunication systems and smoke control and air-handling systems. Hence, when designing sprinkler systems, it will be necessary to consider the interaction of sprinkler systems with other structure and building fire safety systems in order to maximize protection and provide an optimal approach for the overall objectives of fire safety.

STANDARDS AUSTRALIA

Australian Standard
Automatic fire sprinkler systems

Part 1: General systems

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for the design, installation and commissioning of automatic fire sprinkler systems in buildings and structures.

NOTE: Occupancy classifications are given in Appendix A.

1.2 OBJECTIVE

The objective of this Standard is to provide designers and installers with minimum requirements for the design and installation of automatic fire sprinkler systems.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

NOTE: For a list of informative documents referenced in this Standard, see Bibliography (Appendix B) at the end of the document.

AS

1074 Steel tubes and tubulars for ordinary service

1281 Cement mortar lining of steel pipes and fittings

1349 Bourdon tube pressure and vacuum gauges

1432 Copper tubes for plumbing, gasfitting and drainage applications

1516 The cement mortar lining of pipelines in situ

1579 Arc-welded steel pipes and fittings for water and waste-water

1650 Galvanized coatings on ferrous articles Metric Units

1670 Fire detection, warning, control and intercom systems—System design, installation and commissioning

1670.1 Part 1: Fire

1670.3 Part 3: Fire alarm monitoring

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

1735 Lifts, escalators and moving walks

1834 Material for soldering

1834.1 Part 1: Solder alloys

1873 Powder-actuated (PA) hand-held fastening tools

2118 Automatic fire sprinkler systems

2118.1 Part 1: General requirements