AS 1668.1:2015
(Incorporating Amendment No. 1)

AS 1668.1:2015

Australian STANDARD

The use of ventilation and air conditioning in buildings

Part 1: Fire and smoke control in buildings

STANDARDS Australia

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- Australasian Fire and Emergency Service Authorities Council
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- Australian Industry Group
- Australian Institute of Refrigeration Air Conditioning and Heating
- Chartered Institution of Building Services Engineers
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- Engineers Australia
- Facility Management Association of Australia
- Institute of Refrigeration Heating and AirConditioning Engineers of New Zealand
- Insulation Contractors Association of Australia, NSW
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- Victorian Building Authority

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Australian Standard®

The use of ventilation and air conditioning in buildings

Part 1: Fire and smoke control in buildings

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PREFACE

This Standard was prepared by the Standards Australia Committee ME-062, Ventilation and Air conditioning, to supersede AS/NZS 1668.1:1998, *The use of ventilation and airconditioning in buildings*, Part 1: *Fire and smoke control in multi-compartment buildings* and AS 1668.3—2001, *The use of ventilation and airconditioning in buildings*, Part 1: *Smoke control systems for large single compartments or smoke reservoirs*.

This Standard incorporates Amendment No. 1 (December 2018). 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.

A1 Amendment No. 1 to this Standard was prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee ME-062, Ventilation and Airconditioning. As a consequence of Amendment No. 1, which is published as an Australian-only amendment, the designation of this Standard has been changed from AS/NZS 1668.1:2015 to AS 1668.1:2015.

The objective of this Standard is to provide standardized minimum requirements for mechanical air-handling and mechanical smoke control systems for use by designers, installers, inspectors and regulators of these systems

There is a considerable body of fire research that indicates that when a fire occurs in a building, the smoke from the fire is a far greater hazard to occupant safety than the fire itself, that is:

(a) Smoke obscures vision, preventing occupants from finding safe escape routes.

A1 (b) Smoke hinders the emergency services personnel during intervention activities (including search and rescue operations).

(c) Smoke can kill by asphyxiation or by poisoning people well before the temperature of the fire or smoke causes injury.

The fundamental purpose of this document is, therefore, life safety.

The main technical changes made in this edition are as follows:

(i) A hot layer smoke control arrangement has been added.

(ii) The function of car park ventilation systems has been revised.

(iii) The requirements for detection and initiation of smoke control systems have been transferred to AS 1670.1.

(iv) The requirements for construction and installation of fire dampers, smoke dampers and air dampers have been transferred to AS 1682 series.

(v) Mandatory requirements for baseline data have been included.

(vi) Inclusion of requirements for flame and spark arrestance in certain kitchen exhaust systems.

(vii) Amendments to text to clarify various clauses of the previous edition, which were often misunderstood.

(viii) Additional informative appendices including guidance on subduct use and testing criteria exit pressurization 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.

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

Figures provided in this Standard are informative.

This Standard incorporates a 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

The first edition of AS 1668.1, published in 1974, prescribed a smoke control system intended to restrict the movement of smoke by way of air-conditioning and ventilation ducting within a multistorey office building. This philosophy did not address smoke movement in a building by way of paths other than the air-handling system. Since the original publication, the Standard has changed, the zone pressurization system was added and the Standard has been applied (correctly and incorrectly) to buildings other than multistorey offices.

The objective of the Standard was also expanded to limit smoke spread in a building by way of paths other than simply the ductwork. This revision looked deeper into the application of the Standard within buildings with varied uses and, hence, offers designers more options to find solutions for particular building types and further clarifies the intended application of the Standard.

This edition of the Standard includes provisions for an additional method of smoke control within large interconnected volumes whereby smoke is allowed to collect in smoke reservoirs in the vicinity of the ceiling/roof and is removed by fans from the high level reservoirs, with make-up air at low level. This hot layer smoke control system arrangement is similar to that detailed previously in AS 1668.3—2001, *The use of ventilation and air-conditioning in buildings*, Part 3: *Smoke control systems for large single compartments or smoke reservoirs*; however only the mechanical exhaust arrangement has been incorporated into this Standard. (The buoyancy driven arrangement is not incorporated in this Standard.)

STANDARDS AUSTRALIA

Australian Standard
The use of ventilation and air conditioning in buildings

Part 1: Fire and smoke control in buildings

SECTION 1 GENERAL

1.1 SCOPE

This Standard sets out minimum requirements for the design, construction, installation and commissioning of mechanical smoke control systems in buildings. Specific methods of smoke control are defined and the appropriate requirements specified for each.

The design information given in this Standard in respect to hot layer smoke control is based on a single axisymmetric plume, which is confined to one reservoir. Smoke plumes spilling across multiple reservoirs are not considered.

Requirements for the maintenance of smoke control systems are not included.

This Standard applies to Class 2 to Class 9 buildings where smoke control is required.

NOTES:

1 The Standard does not identify those buildings in which smoke control systems or pressurization systems are required. This is covered in the *National Construction Code* (NCC).

2 AS 1851 outlines management procedures for maintaining the fire and smoke control features of mechanical services.

1.2 EXCLUSIONS

This Standard does not apply to the following:

(a) Buildings or facilities where occupant risk due to building operation could be prejudiced by the operation of a smoke control system (see Note 1).

(b) Class 1 and Class 10 buildings.

NOTES:

1 Examples of such buildings where the operation of a smoke control system may be detrimental to the prime function of the space include correctional facilities, buildings with special security arrangements, laboratories, specialized industrial premises or particular areas of health care buildings such as operating theatres and infectious disease wards (see Appendix A).

2 For a description of building class, refer to the National Construction Code (NCC).

3 The NCC specifies minimum requirements for the application of smoke control systems in buildings in Australia.

C1.2 *Typical classes of buildings (or parts of buildings) include but are not limited to multistorey, multi-compartment, large single compartment, high- or low-rise buildings such as the following:*

(a) Offices and educational.

(b) Residential—high-rise units and hotels.

(c) Health and aged care buildings (see Appendix A).