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Australian Standard 1668, Part 1—1979

Amdt 1

SAA MECHANICAL VENTILATION AND AIRCONDITIONING CODE

Part 1—FIRE PRECAUTIONS IN BUILDINGS WITH AIR-HANDLING SYSTEMS

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

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THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL ORGANIZATIONS and departments were officially represented on the committee entrusted with the preparation of this standard:

Association of Consulting Engineers Australia

Australian Gas Association

Australian Institute of Refrigerating, Air Conditioning and Heating Incorporated

Board of Fire Commissioners, N.S.W.

Building Owners and Managers Association of Australia Limited

Confederation of Australian Industry

Council of the Air Conditioning and Mechanical Contractors Association of Australia

Council of the City of Sydney

CSIRO, Division of Mechanical Engineering

Department of Construction

Department of Local Government

Department of Public Works

Electricity Supply Association of Australia

Health Commission of N.S.W.

Insurance Council of Australia

Interstate Standing Committee on Uniform Building

Institution of Engineers Australia

Metal Trades Industry Association of Australia

Retail Traders Association of N.S.W.

Royal Australian Institute of Architects

Society of Mechanical Engineers of Australasia

Thermal Insulation Contractors Association (N.S.W.)

University of New South Wales

This standard, prepared by Committee ~~BD/41~~ ME/62, Mechanical Ventilation and Air Conditioning in Buildings, was approved on behalf of the Council of the Standards Association of Australia on 9 March 1978, and was published on 1 May 1979.

To keep abreast of progress in industry, Australian standards are regularly reviewed. Suggestions for improvements to published standards, addressed to the head office of the Association, are welcomed.

This standard was issued in draft form for public review as DR 76053.

STANDARDS ASSOCIATION OF AUSTRALIA
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AMENDMENT No 1
to
AS 1668, Part 1—1979
FIRE PRECAUTIONS IN BUILDINGS WITH AIR-HANDLING SYSTEMS

SUMMARY: The following sections of the standard are covered by this amendment: Preface, Clauses 1.5.16, 2.1, 2.1.2.4, 3.1.1, 3.3, 4.2.2, 4.5.1.3, 4.5.1.4, 4.5.1.7, 4.5.2.1, 5.2.1, 6.3 and Appendix B.

Published on 1 December 1979.

AMDT No 1 NOV. 1979 **Page 2. Preface.**
Alter 'ASTM D92' to 'ASTM D93'.

AMDT No 1 NOV. 1979 **Page 5. Clause 1.5.16 (a).**
Alter 'combustile' to 'combustible'.

AMDT No 1 NOV. 1979 **Page 6. Clause 2.1.**
Heading—*alter* 'SYSTEM' to 'SYSTEMS'.

AMDT No 1 NOV. 1979 **Page 6. Clause 2.1.2.4 (b).**
Alter '(d) and (e) below' to '(e) and (f) below'.

AMDT No 1 NOV. 1979 **Page 13. Clause 3.1.1.**
Alter 'ASTM D92' to 'ASTM D93'.

AMDT No 1 NOV. 1979 **Page 13. Clause 3.3.**
9th line—*add* 'or duct'.

AMDT No 1 NOV. 1979 **Page 15. Clause 4.2.2 (a).**
2nd line—*alter* 'in' to 'to'.

AMDT No 1 NOV. 1979 **Page 16. Clause 4.5.1.3.**
Alter heading to read 'Ducts for Kitchen-exhaust Hoods'.

AMDT No 1 NOV. 1979 **Page 16. Clause 4.5.1.4.**
Delete existing paragraphs (a) and (b) and *substitute*:

(a) Ducts that convey return air through more than one fire compartment shall be not less fire-resisting than is required for the construction separating the compartments from the point of entry to another fire compartment through to the return-air shaft or the smoke-spill shaft (see Fig. 2.5)—

(i) in the case of fire within the duct, in terms of resistance to collapse, loss of integrity and insulation; and

(ii) in the case of fire outside the duct, in terms of resistance to collapse only.

(b) Ducts that convey supply air to pressurized fire-isolated stairways, fire-isolated ramps, or fire-isolated passageways shall be not less fire-resisting with respect to a fire outside a duct than that required of the walls of the stairshaft supplied, in terms of resistance to collapse, loss of integrity and insulation, from the approved point of intake to the stairshaft served.

Page 17. Clause 4.5.1.7. AMDT No 1 NOV. 1979
After 'exposed' *insert* 'surfaces'.

Page 17. Clause 4.5.2.1 (c). AMDT No 1 NOV. 1979
Alter '4.1.2 (c)' to '4.1.2 (e)'.

Page 19. Clause 5.2.1. AMDT No 1 NOV. 1979
Paragraph (c) (i)—*alter* to read 'Stages (a), (b), (d), (e), (g), (h) and (j) of Rule 5.2.2'.

Paragraph (d)—*alter* to read 'Stages (a), (b), (h) and (j) of Rule 5.2.2'.

Page 21. Clause 6.3. AMDT No 1 NOV. 1979
Alter '5.5.2 (b)' to '5.2.2 (b)'.

APPENDIX B

TABULAR ARRANGEMENT OF OPERATIONAL REQUIREMENTS

Operational stages (Rule 5.2.2)	Conditions for automatic initiation (Rule 5.2.1)						
	5.2.1 (a) Building fire alarm system actuation	**5.2.1 (b) Actuation of recycle-air smoke sensor group**	**5.2.1 (c) Actuation of supply-air smoke sensor group**		**5.2.1 (d) Actuation of pressurizing air-smoke sensor group**	**5.2.1 (e) Actuation of supply-air *and* recycle-air smoke sensor groups**	**No smoke after automatic re-setting of supply-air smoke sensor group**
			(i) Provision for smoke-spill	**(ii) No smoke-spill provision**			
5.2.2 (a) Actuation and transmission of fire alarm	X	X*	X*	X*		X*	After time delay—Automatic restoration of operational status applicable prior to occurrence of initiation condition (c), (d) or (e), as applicable
5.2.2 (b) Activation of stairway pressurizing system	X	X	X	X		X	
5.2.2 (c) Activation of supply air	X	X					
5.2.2 (d) Actuation of smoke-spill fan or change of recycle-air fan operation to smoke-spill mode	X	X	X			X	
5.2.2 (e) Recycle-air and spill-air damper changeover	X	X	X			X	
5.2.2 (f) Opening of outside air damper	X	X					
5.2.2 (g) Full opening of smoke-spill damper	X	X	X			X	
5.2.2 (h) Closure of outside-air damper			X	X		X	
5.2.2 (j) Supply-air fan shut-down and activation of stairway pressurizing system			X	X		X	
5.2.2 (k) Shut-down of pressurizing fan					X		
Subject to approval of Regulatory Authority							
Operational stages for special cases							
Rule 5.3.1:Exhaust systems *not* of fire-rated construction							
Shutdown of exhaust systems and associated supply-air systems		X					
Rule 5.3.2:Special air-handling systems of fire-rated construction	← MAY CONTINUE IN OPERATION →						

*Subject to approval of Fire Authority.

AUSTRALIAN STANDARD

RULES FOR THE USE OF MECHANICAL VENTILATION AND AIRCONDITIONING IN BUILDINGS

known as the

SAA MECHANICAL VENTILATION AND AIRCONDITIONING CODE

Part 1

FIRE PRECAUTIONS IN BUILDINGS WITH AIR-HANDLING SYSTEMS

AS 1668, Part 1—1979

First published 1974
Revised 1979

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
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PREFACE

This standard was prepared by the Association's Committee on Mechanical Ventilation and Airconditioning in Buildings as a revision of AS 1668, Part 1—1974.

Part 1 of AS 1668 was first published in 1974 in response to a request by the Interstate Standing Committee on Uniform Building Regulations. As a result of extensive use of the standard throughout Australia and its implementation by the Building Regulatory Authorities, this revision was undertaken to clarify certain portions and to provide additional information relating to some requirements.

This Part covers precautions which need to be taken when designing, installing and operating an air-handling system, to prevent the spread of fire and products of combustion, by way of the system, throughout the building in the event of fire. Part 2, which was published in 1976, deals with the ventilation requirements for mechanical ventilation and airconditioning of buildings. This standard does not at present cover rules for testing and maintenance; such rules will be prepared for later inclusion in a suitable form.

Although fire rarely starts in the ducts of ventilation and airconditioning systems, the ductwork does provide a ready means by which fire and products of combustion in any part of the building can spread throughout the building. Fire dampers are incorporated in air-handling systems to impede such spread of fire and products of combustion. Requirements for their application and installation are described in this Part, while the requirements for construction, testing and marking of fire dampers are included in AS 1682, Fire Dampers.

It is proposed to publish a commentary to Parts 1 and 2 of AS 1668 to provide guidance in their use.

This standard requires reference to the following standards:

AS 1530	Methods for Fire Tests on Building Materials and Structures Part 1—Combustibility Test for Materials Part 3—Test for Early Fire Hazard Properties of Materials Part 4—Fire-resistance Test of Structures
AS 1668	SAA Mechanical Ventilation and Airconditioning Code Part 2—Ventilation Requirements
AS 1670	SAA Code for Automatic Fire Alarm Installations
AS 1682	Fire Dampers
AS 1905	SAA Fire Door Code Part 1—Fire Doors
AS 1890	Thermally-released Links
AS 2118	SAA Code for Automatic Fire Sprinkler Systems
AS 3000, Part 1	SAA Wiring Rules
ASTM ~~D 92~~ 93 (ANSI Z11.6)	Method of Test for Flash and Fire Points by Cleveland Open Cup

Amdt 1.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
RULES FOR THE USE OF MECHANICAL VENTILATION AND AIRCONDITIONING IN BUILDINGS

PART 1—FIRE PRECAUTIONS IN BUILDINGS WITH AIR-HANDLING SYSTEMS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Part of these Rules (hereinafter referred to as 'this Part of the Code') sets out requirements for the design, construction, installation and operation of air-handling systems as related to precautions intended to prevent the spread of fire and smoke through buildings by way of the air-handling systems, i.e. ventilation and airconditioning systems, where they are subject to the application of this Part of the Code (see Rule 1.3).

NOTE: Where the process in any building or room is of such nature as to require specialized control of atmospheric conditions, or is subject to control by a Regulatory Authority, the provisions of this Part of the Code may be varied, provided that such variations are approved.

1.2 PURPOSE. The purpose of this Part of the Code is to ensure that, in the event of a fire occurring in the building, the air-handling system assists in the control of smoke and fire by—

(a) preventing, as far as practicable, the recycling of the products of combustion through the building;

(b) exhausting, as far as practicable, the products of combustion from the fire-affected enclosure;

(c) maintaining the supply of outside air to the building to provide the pressure balance to the exhaust action of the smoke-spill fan on those storeys not involved in the fire;

(d) preventing the products of combustion from entering fire-isolated stairways, fire-isolated ramps and fire-isolated passageways; and

(e) preventing fire from spreading by way of supply-air ducts and shafts to other storeys.

NOTE: It is not intended that this Part of the Code should impose unnecessary restrictions on design and installation of systems, nor on the development and use of new, improved or unusual materials, designs, or methods of construction or installation not covered by this Part of the Code (see Rule 1.4).

1.3 APPLICATION. This Part of the Code applies as follows:

(a) Except when stated or required otherwise, it applies to air-handling systems in buildings required to be provided with one or more fire-isolated stairways, where such air-handling systems, with or without return air, supply more than one fire compartment or more than one floor.

(b) It does not apply to individual systems handling air for one fire compartment only.

(c) It may not be required to be applied to air-handling systems for approved special purpose enclosures such as computer rooms, hospital operating theatres and intensive-care wards, scientific laboratories and like applications, where departure from normal operation of the air-handling system would cause hazard to life or serious damage to property. Enclosures for such applications should be served by independent air-handling systems, which should be approved (see Rules 1.5.5 and 1.5.18).

1.4 INTERPRETATIONS. Where it is desired to use new designs or unusual materials, methods of construction, erection or operation not covered by this Part of the Code and where doubt exists regarding interpretation of any aspect of this Part of the Code, details of such matters may be submitted to the SAA Committee on Mechanical Ventilation and Air Conditioning in Buildings for an expression of opinion regarding compliance with the intention and spirit of this Part of the Code.

NOTE: Such rulings and interpretations are subject to approval (see Rule 1.5.5).

1.5 DEFINITIONS. For the purpose of this Part of the Code, the following definitions apply.

1.5.1 Air—atmosphere air, as specifically defined in the following definitions, comprising gaseous components normally of the order by volume of 21 percent oxygen, 78 percent nitrogen, 0.03 percent carbon dioxide and 0.97 percent of traces of other gases including hydrogen, neon, krypton, helium, ozone, argon and xenon, and water vapour and contaminants. (See also Fig. 2.1 in Part 2 of this Code.)

1.5.1.1 *Exhaust air*—air, other than return air, removed from an enclosure by an air-handling unit.

1.5.1.2 *Outside air*—air outside the building.

1.5.1.3 *Recycle air*—that portion of air removed from enclosures as return air by an air-handling unit and returned to the air-handling system as part of the supply air.

1.5.1.4 *Return air*—air removed from an enclosure by the air-handling system. All of the return air may be expelled from the air-handling system as spill air, or all or part of it may be returned to the system as recycle air.