

STANDARDS AUSTRALIA

Amendment No. 1
to
AS/NZS 1668.1:2015
The use of ventilation and air conditioning in buildings
Part 1: Fire and smoke control in buildings

REVISED TEXT

The 2015 edition of AS/NZS 1668.1 is amended as follows; the amendments should be inserted in the appropriate places.

SUMMARY: This Amendment applies to the following:

- Front cover, Title page and Preface.
- Clauses 1.4.26, 1.4.40, 1.4.41, 1.4.58, 1.4.61, 1.4.65, 1.4.66 (new), 1.6, 2.3, 2.3.1, 2.3.5 (new), 3.2.3.1, 3.3.2, 3.3.3, 3.6.1, 3.7.1, 3.7.4, 4.1, 4.2, 4.6, 4.10.1, 4.10.2.2, 4.10.3, 4.11.1, 4.11.4.2, 4.11.4.4, 4.11.5, 4.13.4, 4.15, 5.2.1, 5.2.3, 5.3.1, 5.3.2, 5.4.1, 5.4.2, 5.5.1, 5.5.3, 6.2.2, 6.2.3.1, 6.2.3.3, 6.2.5, 6.2.6, 7.1, 7.2.1, 7.2.2, 7.2.3, 9.3, 9.4.3, 9.9.3, 9.9.5, 10.2.2, 10.2.4, 10.3 and 10.4.3.
- Tables 4.1, 8.3 and 8.4.
- Figures 4.1, 4.2, 5.1, 5.2, 9.2, 9.3 and CH2.
- Appendices A, B, E, J and K.

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Front cover

Delete 'AS/NZS 1668.1:2015' and *replace* with 'AS 1668.1:2015'.

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Title page

Delete 'AS/NZS 1668.1:2015' and *replace* with 'AS 1668.1:2015'.

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Preface

- 1 After first paragraph, *insert* new paragraph as follows:

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.

- 2 Third paragraph, Item (b), *delete* text and *replace* with the following:

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

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Clause 1.4.26

Delete note and *replace* with the following:

NOTE: The FDCIE panel was formerly known as FIP and SIP.

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Clause 1.4.40

Delete text and *replace* with the following:

An exhaust system forming an air path between two or more fire compartments, with a total aggregate of penetrations from any individual connected fire compartment not exceeding 0.1 m².

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Clause 1.4.41

Delete text and *replace* with the following:

A supply system forming an air path between two or more fire compartments, with a total aggregate of penetrations into any individual connected fire compartment not exceeding 0.1 m².

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Clause 1.4.58

Delete text, including note, and *replace* with the following:

A special configuration of those elements of an air-handling system that is used to conduct smoke exhaust air by use of a smoke exhaust fan, and extends from the most upstream smoke or fire-resistant barrier that is being penetrated to the point of discharge outside the building.

NOTE: Also known as smoke-spill system.

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Clause 1.4.61

Delete text and *replace* with the following:

A device, when constructed and installed in accordance with Section 3, is deemed to provide an acceptable level of protection to an opening in a building element required to have a fire resistance level, and is intended to limit the backflow of smoke under fire conditions.

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Clause 1.4.65

Delete text and *replace* with the following:

A zone pressurization system applicable to multi-compartment buildings.

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Clause 1.4.66 (new)

After Clause 1.4.65, *insert* the following:

1.4.66 Temperature of fusion

For the purposes of this Standard, the temperature of fusion is deemed to be the melting point of the material under consideration.

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Clause 1.6

- 1 Commentary C1.6, first paragraph, *delete* text and *replace* with the following:

This Standard sets out requirements for using air-handling system(s) to reduce smoke spread from fire-affected areas to other areas. Possible leakage paths are shown in Figure C1.6. Systems designed in accordance with this Standard are expected to maintain a tenable atmosphere within fire-isolated exits to enable occupant evacuation and emergency services personnel intervention activities (including search and rescue operations).

- 2 Commentary C1.6, third paragraph, *delete* text and *replace* with the following:

Smoke layer exhaust systems are intended to maintain the smoke layer above occupants to facilitate occupant evacuation and intervention activities by emergency services personnel (including search and rescue operations).

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Clause 2.3

Delete clause title and *replace* with the following:

2.3 DUCTWORK MATERIALS AND INSTALLATION

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Clause 2.3.1

Delete clause, including title, and *replace* with the following:

2.3.1 Materials

The material, or any composite material, used in the construction of ductwork shall be in accordance with the fire hazard property requirements of AS 4254.1 and AS 4254.2.

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Clause 2.3.5 (new)

After Clause 2.3.4, *insert* the following:

2.3.5 Duct construction

Ducts and components associated with systems required to operate in the fire mode shall be constructed in accordance with the fire hazard properties, construction and installation requirements of AS 4254.1 and AS 4254.2 (excluding insulation fixing requirements).

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Clause 3.2.3.1

Item (b), *delete* text and *replace* with the following:

- (b) For a fire damper that is connected to ductwork conforming with Clause 2.3.2 and with a minimum total duct length of 2 m (with or without breakaway joints), insulation shall not be required.

NOTE: Omission of breakaway joint(s) is to be supported by documentation demonstrating that the building element's FRL will not be adversely affected. Such documentation is to be based on a prototype test as specified in Clause 3.3.2(d) or soundly designed in accordance with fire engineering principles.

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Clause 3.3.2

- 1 At the end of Item (e) *delete* 'or'.
- 2 At the end of Item (f) *delete* '.' and *replace* with '; or'.
- 3 After Item (f), *add* the following:
 - (g) located at the entry to a shaft forming part of a mechanical smoke exhaust system (in accordance with Clause 3.6) or a minor exhaust system (in accordance with Clause 5.3.1), which continue to operate in fire mode and are protected by a subduct.
- 4 Second paragraph, *delete* text and *replace* with the following:
For the purposes of Items (e), (f) and (g), shafts shall not form part of multiple fire compartments simultaneously.

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Clause 3.3.3

Delete text and *replace* with the following:

Openings in building elements that are required to have an FRL shall NOT include fire dampers and shall be protected by other means in accordance with this Standard, where such openings are—

- (a) protected by a required subduct (see Clause 3.7.4);
- (b) in series and downstream of another opening that is protected with a subduct in accordance with Clause 3.6 or Clause 5.3;

C3.3.3(b) *Minor exhaust systems may be protected with subducts in lieu of fire dampers. Subducts can take up more shaft space but do not require maintenance. System operational requirements are different depending on the type of protection employed.*

Fire dampers and subducts may be installed in the same system, provided a fire damper is not in series and downstream of any subduct.

- (c) associated with a duct forming part of a kitchen exhaust system required to conform with AS 1668.2, which shall be installed in accordance with Section 6;
- (d) associated with a duct forming part of a common residential kitchen exhaust system that is configured as a minor exhaust system and provided with subducts in accordance with Clauses 3.6 and 3.7.4;
- (e) part of a lift vent, which shall be configured in accordance with Clause 3.4;
- (f) associated with a diesel fire pump room ventilation system, which shall be configured in accordance with Clause 3.4;
- (g) associated with a dedicated fire-isolated exit pressurization system, which shall be configured in accordance with Section 10; and
- (h) associated with a fume cupboard exhaust system where—
 - (i) accelerated corrosion of the fire damper resulting in failure in less than 5 years;
 - (ii) exposure of maintenance personnel to toxic substances during inspection; or
 - (iii) exposure of laboratory staff to toxic substances in the event of faulty fire damper closure, cannot be avoided, in which case the system shall be configured in accordance with Clause 3.4.

C3.3.3 *The exemptions and exclusions listed in this Clause are primarily associated with smoke exhaust systems required to operate in the fire mode where closure of fire dampers during a fire would negate the system function or where conditions of installation of a fire damper will not allow reliable protection of the building element's FRL.*

Clause 3.6.1

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Delete text, excluding notes, and *replace* with the following:

Within the shaft or fire-resisting duct where subducts are used, each subduct shall have an outlet projection facing downstream and extending not less than 500 mm in the direction of exhaust airflow. The air entering the shaft or duct shall travel in an upward direction for not less than 500 mm with no downturns before entering the main exhaust airstream. Where the normal direction of airflow is downwards in a shaft, or horizontal in a duct, the subduct shall discharge the exhaust air horizontally.

Clause 3.7.1

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1 First paragraph, *delete* note.

2 After first paragraph, *add* the following new paragraph:

Where located in a fire-isolated plantroom, smoke exhaust plant and associated ductwork are not required to be enclosed in a fire-resisting construction unless the plantroom contains commercial kitchen exhaust systems or other non-fire-isolated essential services, (e.g. essential switchboards, supply air systems, air pressurization systems, hydrant pumps and emergency batteries).

Clause 3.7.4

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Delete text, including note, and *replace* with the following:

Where smoke or air enters a smoke exhaust system, a subduct, in accordance with Clause 3.6, shall be fitted at each point of entry to the shaft or fire-resisting duct, unless the point of entry is the most upstream point of a smoke exhaust system.

NOTE: An air damper (smoke exhaust) is permitted at each of these entries.

Clause 4.1

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Commentary C4.1, *delete* 'Clause 1.2' and *replace* with 'Clause 1.6'.

Clause 4.2

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1 First paragraph, *delete* 'minimized' and *replace* with 'reduced'.

2 After first paragraph, and before note, *insert* the following new paragraph:

Intakes for fire-isolated exit pressurization systems shall be separate and located to minimize the risk of the simultaneous contamination of multiple fire-isolated exits, except where the intakes only serve a single above ground and single below ground pressurized exit.

Clause 4.6

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Second paragraph, *delete* text and *replace* with the following:

Noise levels in fire-isolated exits, car parks and smoke control zones served by hot layer smoke control systems shall not exceed 80 dB(A).

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Clause 4.10.1

Commentary C4.10.1, *delete* text and *replace* with the following:

Selection of electrical equipment can have a significant effect on the reliability of the smoke control system. For example, variable speed drives used in variable air volume systems and fire-isolated exit pressurization systems may shut down if ambient temperatures exceed 40°C–50°C or if the power supply is disturbed, both of which are likely scenarios during a fire.

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Clause 4.10.2.2

1 After Item (b), and before note, *insert* the following:

- (c) Where control wiring to motorised air dampers within the supply air stream branches (including VAV, but excluding the compartment's supply air dampers) is protected in such a manner that a failure in one fire compartment does not render systems in other fire compartments inoperative.

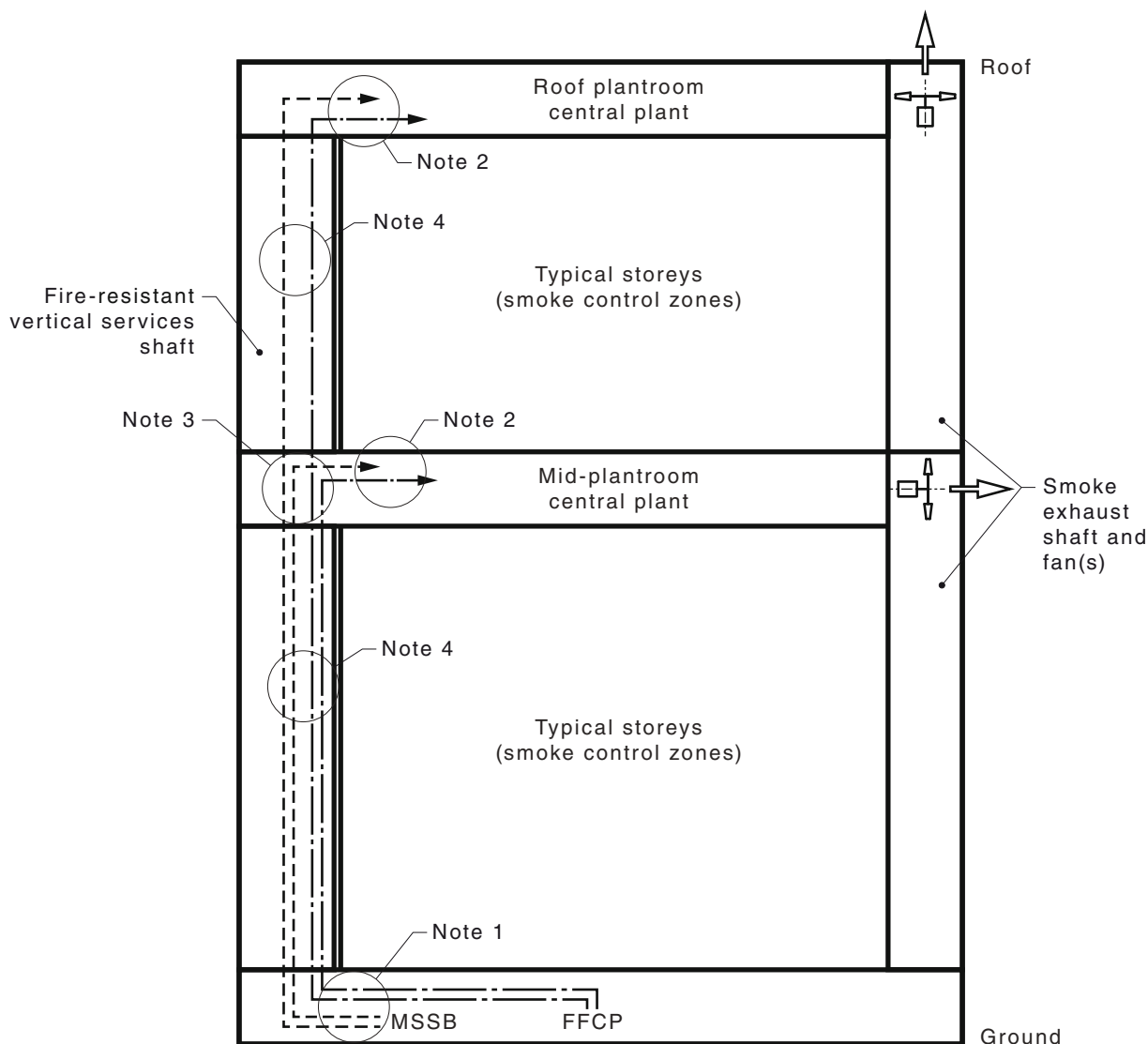
2 Commentary C4.10.2.2, first paragraph, *delete* text and *replace* with the following:

It is not intended to require a fire-resistant power supply or actuator system to each variable air volume (VAV) damper; however, the VAV damper power supply should be protected in such a manner that a failure in one compartment does not render the whole system inoperative and, therefore, prevent the necessary opening of VAV dampers. This exception also applies to other air dampers within the supply air stream, such as those used for out-of-hours isolation.

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Figure 4.1

1 Delete Figure 4.1(a), including notes, and *replace* with the following:



LEGEND:

- Power cabling from MSSB to mechanical equipment
- - - - - Control and status indication cabling from FFCP to mechanical equipment

(a) Power, control and status indication cabling—Central plant

NOTES:

- 1 All cabling, where not protected from fire by fire-resistant construction is to be fire-resistant.
- 2 Cabling within plantrooms serving AHUs operating in fire mode may be non-fire-resistant but is to be fire-resistant when serving smoke exhaust fans.
- 3 Fire-resistant cabling is required for plantroom equipment operating in fire mode if fire-resistant riser shaft is not constructed through plantroom.
- 4 Cabling within fire-resistant riser shafts may be non-fire-resistant. In practice, fire-resistant cabling is likely to be installed throughout, to minimize changes to cable type and associated junctions.
- 5 For control and indicating circuits, similar integrity should apply.
- 6 Wiring may be individual cables or multi-core as required to suit system type.

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Clause 4.10.3

- 1 Second paragraph, *delete* Items (b) and (c) and *replace* with the following:
 - (b) installation above a roof; or
 - (c) a dedicated equipment enclosure for each fire-isolated exit pressurisation system, having construction with an FRL not less than -/120/120.
 - 2 Commentary C4.10.3, *delete* text and *replace* with the following:

A general-purpose equipment plantroom, which is fire separated from the occupied spaces, would meet the requirements of the first paragraph of Clause 4.10.3 above. Switchboards, variable speed drives and other electrical components associated with fire isolated exit pressurization systems may require additional separation within this plantroom.
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Clause 4.11.1

Delete clause and *replace* with the following:

A fire fan control and indication panel (FFCP) and the method of transmission and interface to smoke control systems shall be provided in accordance with AS 1670.1.

Controls, indication and labelling shall be in accordance with Table 4.1 and AS 1670.1.

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Clause 4.11.4.2

Delete Item (b)(ii) and *replace* with the following:

- (ii) Phase failure/reversal at each MCC providing power to air-handling equipment that is required to operate in fire mode.
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Clause 4.11.4.4

Delete clause, including title, and *replace* with the following:

4.11.4.4 Interface cabinet

The MCC interface shall be mounted in a separate cabinet and not contained within the MCC.

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Clause 4.11.5

Delete clause and *replace* with the following:

Control signals between the FFCP and MCC or MCC and any smoke control system equipment shall not be transmitted or rely on any networked control system other than the networking system utilised by the FFCP and in accordance with AS 1670.1.

Control signals within the MCC shall be via relays or dedicated programmable electronic controllers. Where programmable electronic controllers are used, they shall be programmed and arranged such that a failure of any other programmable electronic controller outside of the MCC cannot adversely affect the operation of the programmable electronic controller in the MCC or the operation of smoke control equipment controlled by the MCC.
