

Australian/New Zealand Standard™

**Domestic solid fuel burning
appliances—Installation**



AS/NZS 2918:2018

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CS-062, Solid Fuel Burning Appliances. It was approved on behalf of the Council of Standards Australia on 13 June 2018 and by the New Zealand Standards Approval Board on 6 June 2018.
This Standard was published on 29 June 2018.

The following are represented on Committee CS-062:

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Applied Research Services (Testing Interests New Zealand)
Australasian Fire and Emergency Service Authorities Council
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Australian Chamber of Commerce and Industry
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This Standard was issued in draft form for comment as DR AS/NZS 2918:2017.

Australian/New Zealand Standard™

Domestic solid fuel burning appliances—Installation

Originated in Australia as AS 2918—1987.
Second edition 1990.
Originated in New Zealand as NZS 7421:1972.
Second edition 1985.
Third Australian edition AS 2918—1990.
Third New Zealand edition NZS 7421:1990.
AS 2918—1990 and NZS 7421:1990 jointly revised, amalgamated and
designated AS/NZS 2918:2001.
Second edition 2018.

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Jointly published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001 and by Standards New Zealand, PO Box 1473, Wellington 6140.

ISBN 978 1 76072 127 5

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CS-062, Solid Fuel Burning Appliances, to supersede AS/NZS 2918:2001.

The objective of this Standard is to provide manufacturers, installers and consumers with means for determining the requirements (including clearances from heat-sensitive materials) for the correct and safe installation of domestic solid fuel (wood) burning heating appliances and their associated floor protectors and flue systems. This revision includes the following:

- (a) Changes to the minimum clearance requirement for heat shields for an untested installation and new figures changes to the requirement for heat shields for a tested appliance (see Clause 3.2).
- (b) Changes to the minimum clearance requirement and minimum thickness for continuous heat-tolerant material for an untested floor protector installation (see Clause 3.3.3).
- (c) Major revision to built-in appliance installation, including the addition of several new figures (see Clause 3.4.2).
- (d) Change to stainless steel or Monel fasteners usage requirement to secure enamelled and stainless steel sections.
- (e) Major changes to flues penetrating ceilings floors and walls including the addition of new diagrams displaying requirements for untested flue penetration (see Clause 4.6).
- (f) Changes to the minimum horizontal radius to nearby structures (Clause 4.9.1).
- (g) The addition of new text in Appendix B, Paragraph B8, which describes the requirements for testing water heating devices fitted to appliances.
- (h) The addition of several new diagrams in Appendix F, Paragraphs F7 and F8, which display thermocouple placement requirements for testing.
- (i) Inclusion of a number of minor changes and additions to clarify and support the requirements and specifications of this Standard.

The installation requirements for untested appliances and flue systems apply from the date of publication of this Standard.

Statements expressed in mandatory terms in Tables are deemed to be requirements of this Standard. In this Standard, Notes are for information and guidance only.

The term '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/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Domestic solid fuel burning appliances—Installation**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for the installation of domestic solid fuel burning appliances that can be fully assembled prior to being transported to the installation site. It does not cover the installation of appliances that need to be assembled in situ, or appliances with electrically driven fuel stoker systems.

NOTE: The requirements for the measurements of performance of solid fuel burning appliances in terms of heat output, efficiency and emissions are not covered in this Standard (see AS/NZS 4012 and AS/NZS 4013 for these topics).

This Standard applies to the installation of domestic solid fuel burning appliances, whether installed in domestic or commercial situations, including the following categories:

- (a) Space heaters, including open fronted fireplace inserts and built-in fireplaces.
- (b) Cooking appliances.
- (c) Open-vented water-heating appliances.
- (d) Central-heating appliances.
- (e) Any combination of two or more of the appliance categories shown in Items (a) to (d) above.

NOTE: The installation of second-hand appliances as well as being in accordance with the requirements of this Standard may be subject to additional State or regional requirements.

1.2 EXCLUSIONS

This Standard does not apply to the following:

- (a) Warm air distribution ducting systems beyond the primary wall, floor or ceiling penetration.
- (b) Appliances with flue outlets greater than 100 000 mm².
- (c) The long-term durability of materials.
- (d) The durability of building materials in the vicinity of any appliance installation.

1.3 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

NOTE: Documents referenced for informative purposes are listed in the Bibliography.

AS/NZS

- | | |
|--------|---|
| 1530 | Methods for fire tests on building materials, components and structures |
| 1530.3 | Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release |
| 3000 | Electrical installations (known as the Australian/New Zealand Wiring Rules) |
| 3100 | Approval and test specification—General requirements for electrical equipment |

AS/NZS	
3500	Plumbing and drainage
3500.4	Part 4: Heated water services
4012	Domestic solid fuel burning appliances—Method for determination of power output and efficiency
4013	Domestic solid fuel burning appliances—Method for determination of flue gas emission
NZS	
3603	Timber structures Standard
4603	Installation of low pressure thermal storage electric water heaters with copper cylinders (open-vented systems)
EN	
60584	Thermocouples
60584-1	Part 1: EMF Specifications and Tolerances
ASTM	
D 1037	Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials
ER 93	New Zealand Electricity Regulations 1993
C1/AS1	Acceptable Solution for Buildings with Sleeping (residential) and Outbuildings (Risk Group SH)

1.4 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

1.4.1 Appliance

A solid fuel burning unit intended for use in residential or commercial properties for the purpose of space heating, water heating or cooking.

1.4.2 Approved

Approved by the appropriate regulatory authority.

1.4.3 Attic

One, or a combination of, the following:

- (a) *Attic (decorative)* A low storey or decorative parapet above the main cornice of a classical building, originally designed to hide the roof slope.
- (b) *Attic (storage)* The accessible space within a sloping roof of a house, often used for storage.
- (c) *Attic (habitable)* A habitable upper storey or room(s), built entirely within the roof space of a building, with stair access from the floor below and usually lit by dormers or skylights.

NOTE: In the case of a multistorey dwelling, the ceiling means the ceiling of each storey of the building.

1.4.4 Built-in appliance

An appliance designed to be in contact with or built into a heat-sensitive structure within a building.

NOTE: An appliance with a through-wall, ceiling or other similar hot air outlet should be considered as a built-in appliance (see Clause 3.4).

1.4.5 Central heating appliance

A heating appliance that is designed to be installed for space heating by means of transferring heat to the living area by ducted hot air, hot water, or other fluid.

NOTE: For the purposes of complying with New Zealand regulations, this also refers to a heating appliance that has a maximum heat output rate greater than 25 kW as measured for a period of not less than 6 min under high burn rate conditions set out in Section 6 of AS/NZS 4012.

1.4.6 Chimney chase/facade

Heat-sensitive structure within a building for the purpose of built-in appliance installation, including flue system used.

1.4.7 Clearance

The shortest distance between specific parts, surfaces, or objects.

1.4.8 Commonly used material

Material with a service temperature greater than 100°C.

NOTE: Refer to Appendix C.

1.4.9 Cowl

A device on top of a flue or chimney that is designed to prevent the ingress of wind and rain from entering.

1.4.10 False chimney

Building structure made to surround a flue system.

NOTE: False Chimneychimney, also known as Chimney chimney Chasechase, may be made of non-combustible or combustible structures. False chimneys may be constructed for freestanding, masonry insert or built-in appliance installation.

1.4.11 Firebox

That part of the appliance in which combustion is designed to take place.

1.4.12 Firebricks

Bricks made from heat-resistant material (such as refractory ceramic material) to withstand exposure to high temperatures.

1.4.13 Fireplace

An open fronted masonry structure, incorporating a masonry chimney, in which solid fuel can be burned safely.

1.4.14 Fireplace insert appliance

An appliance designed to be installed in—

- (a) a fireplace; or
- (b) a flued masonry enclosure.

1.4.15 Floor protector

A construction designed to protect heat-sensitive floors or floor surfaces under and in front of the appliance from heat generated by the appliance, spilt ash, or embers.

1.4.16 Flue

A passage for conveying products of combustion from within an appliance to the outside atmosphere.

1.4.17 Flue damper

A device fitted into a flue pipe that can be adjusted to reduce the flow of gas through the pipe.

1.4.18 Flue guard

A device for preventing accidental contact with a flue pipe in a room or to maintain required clearances from the flue-pipe casing inside a cupboard, attic, or another living space other than the room within which the appliance is installed.

1.4.19 Flue pipe

A pipe that creates a flue.

1.4.20 Flue system

A series of interconnecting flue pipes and flue-pipe casings that form a safe passage (flue) for conveying products of combustion from within an appliance to the outside of a building or structure.

1.4.21 Flue-mounted shield

A device, attached to the flue, that forms a barrier limiting the radiant or convective heat transfer.

1.4.22 Flue-pipe casing

One or more layers of pipe which that surround a flue pipe.

1.4.23 Freestanding appliance

An appliance designed to be installed as a solid fuel burning appliance in all areas except in a concrete or masonry fireplace, or recessed into a building structure or fitting.

1.4.24 Fuel chamber

That part of the appliance designed to contain the fuel.

1.4.25 Hearth

The floor area underneath the firebox of an appliance or fireplace.

1.4.26 Heat shield

A device that forms a barrier that limits the radiant or convective heat transfer.

1.4.27 Heat-resistant material

A material with an allowable service temperature of 600°C or greater.

1.4.28 Heat-sensitive material

A material with an allowable service temperature less than 150°C.

1.4.29 Heat-tolerant material

A material with an allowable service temperature greater than 150°C but less than 600°C.

1.4.30 Installer

The person or organization that contracts, or agrees to, the supply of equipment, to carry out an installation or to modify an existing installation.

1.4.31 Mantelpiece

The ornamental structure above and about a fireplace, usually having a shelf (mantelshelf) or projecting ledge.

1.4.32 Mantelshelf

The projecting part of a mantelpiece.

1.4.33 Masonry

A bonded construction using clay bricks, concrete bricks or blocks, pumice concrete, sand lime bricks, square dressed natural stone, terracotta or like materials laid manually unit by unit and set in mortar.

1.4.34 Masonry chimney

A masonry structure, usually vertical, containing a passage or flue by which smoke, gases and other products of combustion from a fire are carried to the outside of a building and by means of which a draught is created to assist combustion.

1.4.35 Masonry enclosure

An open fronted masonry structure not incorporating an integral masonry chimney, originally designed to surround a solid fuelled cooking and/or heating appliance.

1.4.36 Masonry fireplace

A fireplace constructed from masonry materials.

1.4.37 Masonry recess

A construction of masonry materials designed for use as a surround or recess for installation of a freestanding domestic solid fuel burning appliance.

1.4.38 Open-vented hot-water system

A hot water system that has an unobstructed venting to atmosphere with the highest point of the vent being not greater than 5 m above the lowest point of the system.

1.4.39 Penetrations**1.4.39.1 Flat ceiling penetration**

Where the angle (slope) of the ceiling is 30° or less from the horizontal plane.

1.4.39.2 Sloped ceiling penetration

Where the angle (slope) of the ceiling is greater than 30° but less than 60° from the horizontal plane.

1.4.39.3 Wall penetration

Where the angle (slope) of the wall or ceiling is between 60° and 90° from the horizontal plane.

1.4.40 Regulatory authority

The authority having statutory control in respect of any work carried out in connection or association with a domestic solid fuel burning appliance installation in a particular locality.

1.4.41 Shall

Indicates that a statement is mandatory.

1.4.42 Should

Indicates a recommendation.

1.4.43 Tempering valve

A mixing valve that is temperature actuated and is used to temper a hot water supply with cold water to provide hot water at a lower temperature, e.g. 50°C, at one or more outlet fixtures.

1.4.44 Thermal resistance

For a particular material, the temperature difference divided by the density of heat flow rate.

NOTES:

- 1 Unit and symbol: square metre kelvin per watt ($\text{m}^2\text{K/W}$). Quantity symbol: R .
- 2 Although the term 'thermal resistance' and the symbol R are widely used in Australian and New Zealand industry, the International Organization for Standardization uses the terms 'thermal insulance' and 'coefficient of thermal insulation' and the symbol M for this quantity.

1.4.45 Zero-clearance box/cabinet

A cabinet intended for use with built-in installations designed to shield heat-sensitive materials.

1.5 INSTALLATION AND OPERATING INSTRUCTIONS

Installation and operating instructions shall be included with the appliance.

NOTES:

- 1 For guidance on the content for installation and operating instructions, see Appendix G.
- 2 Testing laboratories may require installation instructions including all minimum clearances, minimum ventilation area of flue casings and chimney cavity, as appropriate, and the means for excluding rain and wind-blown debris from the flue or chimney exit.

SECTION 2 MATERIALS

2.1 MATERIAL SERVICE TEMPERATURE

All materials used in the installation of solid fuel burning appliances shall be capable of withstanding the temperatures they are likely to be exposed to in service, without degradation.

The allowable service temperature of materials shall be determined by testing in accordance with the requirements of Appendix C. Materials required to be heat-resistant or heat-tolerant shall have an allowable service temperatures as follows:

- (a) Heat-resistant material, greater than 600°C.
- (b) Heat-tolerant material, in the range of 150°C to 600°C.

Materials determined to have a service temperature less than 150°C, when tested in accordance with Appendix C, shall be classified as 'heat-sensitive'.

2.2 FLOOR PROTECTOR MATERIALS

A floor protector shall be constructed from any material, or combination of materials, which ensures the protector is in accordance with or exceeds the requirements of Clause 3.3.2 (see Note 1).

All materials used in the construction shall be capable of withstanding the temperatures they are likely to be exposed to in service without degradation (see Note 2).

NOTES:

- 1 Where exposed metal components are employed in floor protector construction, they should be corrosion resistant and of a durable design.
- 2 Care should be exercised in the selection of insulating materials as some materials are not capable of withstanding the temperatures to which they may be exposed.

2.3 FLUE SYSTEM

A flue system, including any access port covers, shall be constructed from any of the following materials:

- (a) Grades 301, 302, 304, 310, 316 or Grade 321 austenitic stainless steel having a minimum thickness of 0.52 mm. For non-corrugated flexible flue pipe, within a chimney, the minimum thickness shall be 0.25 mm. For corrugated flexible flue pipe only, within a chimney, the nominal thickness shall be not less than 0.13 mm, and the material shall be 316 grade austenitic stainless steel (see Note 1).
- (b) Low carbon enamelling quality steel having a minimum thickness of not less than 0.8 mm, with a vitreous enamel coating over the entire inner and outer surfaces. Vitreous enamel flue sections shall have lock seams or continuously welded seams.
- (c) Any other material and or thickness which has properties equal to or better than, Item (a) or Item (b) and is able to be used as a flue system (see Note 2).

NOTES:

- 1 The minimum thicknesses specified are actual, not nominal, thicknesses.
- 2 Item (c) is intended to allow for the introduction of new or improved materials.

2.4 FLUE-PIPE CASINGS

Flue-pipe casings shall be constructed from stainless steel, corrosion-protected steel, copper, aluminium or brass.

Casings shall have a minimum thickness (including coating, if any) of—

- (a) not less than 0.52 mm for stainless steel; and
- (b) not less than 0.55 mm for corrosion protected steel and non-ferrous materials.

SECTION 3 APPLIANCE INSTALLATION

3.1 GENERAL

Installation of an appliance or modification of an existing installation shall be in accordance with this Section.

NOTES:

- 1 The appliance should be assembled and installed in accordance with the manufacturer's instructions. All manufacturer's installation, operation, and maintenance instructions supplied with the appliance should be left with the appliance after work on the installation has been completed.
- 2 Appliances altered in any way from the original specification should be considered to be 'untested' appliances for purposes of installation (see Section 5).
- 3 Recommendations for installation and operating instructions should be included with the appliance (see Appendix G).

3.2 CLEARANCES AND HEAT SHIELDING

3.2.1 Access clearances

To provide the user with access to the appliance, the clearance between any part of the appliance and any adjacent fixed surface or object shall be not less than the following:

- (a) For the appliance front surface 1 m.
The clearance specified shall apply when any door or drawer is in its closed position with respect to the appliance surface.
- (b) For any appliance surface (other than the appliance front surface) that includes an opening for fuelling or ash removal, or to which regular access by the user is otherwise necessary 500 mm.
The clearance specified shall apply when any door or drawer is positioned at its fullest extent of protrusion from the appliance surface.
- (c) For any part of the appliance (other than the surfaces described in Items (a) and (b) above) to which only hand access, occasional user access, or maintenance access is necessary 100 mm.
The clearance specified shall apply when any knob or control is positioned at its fullest extent of protrusion from the appliance surface.

3.2.2 Safety clearance

Subject to the requirements of Clauses 3.2.1 and 3.4, and unless otherwise reduced by the provision of heat shielding (see Clause 3.2.3), the minimum clearance between any part of the appliance and any heat-sensitive material shall be one of the following, as appropriate:

- (a) *Where a sample installation has been tested in accordance with Appendix B* A clearance where the temperature rise of any surface of the test enclosure shall not exceed the temperatures specified in Appendix B during the high fire or flash fire tests, whichever is applicable.
- (b) *Where a sample installation has not been tested in accordance with Appendix B* A ceiling of not less than 1500 mm vertically above the appliance or 1200 mm in any other direction above the floor level.

Clearances specified shall be valid for commonly used building materials only.

NOTES:

- 1 Materials with high heat-sensitivity, may necessitate an increase in specified clearances to prevent any adverse heat effects on the material.
- 2 Consideration should be given to clearances between the installation and window curtains and drapes; and to the proximity of window drapes and curtains, which should be restrained to maintain the minimum clearances for heat-sensitive materials.

3.2.3 Shielding for appliances

The safety clearances, specified in Clause 3.2.2, Items (a) and (b), between a tested, or an untested, appliance and a heat sensitive material, may be reduced by the provision of a heat shield. A heat shield may be made of a heat tolerant material as per Clause 3.2.4. A heat shield made of a heat-resistant material shall be constructed in accordance with Items (a) (b) and (c) or, alternatively, Item (d):

- (a) Except where the heat shield's size is restricted by an abutment with the floor, a wall or another heat shield (refer Clauses 3.3.2 and 3.3.3), the size of a heat shield shall either—
 - (i) extend in all directions such that the unobstructed straight-line distance between the appliance and the heat sensitive material is not less than the safety clearance established under Appendix B testing [see Figure 3.1(b)]; or
 - (ii) where the appliance has not been tested in accordance with Appendix B, a distance not less than 450 mm either side of the appliance and extending vertically to within 100 mm, but not less than 50 mm, of the ceiling having regard to the ventilation requirements of Clause 3.2.3(c) [see Figure 3.1(a)].
- (b) Subject to—
 - (i) access requirements of Clause 3.2.1; and
 - (ii) insert and built-in requirements of Clause 3.4,
 the minimum allowable clearance between an appliance and heat-sensitive material shall be calculated by multiplying the safety clearance, specified in Clause 3.2.2(a) or (b), by the clearance factor that corresponds with the heat shield's construction specified in Tables 3.1 or 3.2 [see Figures 3.1(a) and 3.1(b)].
- (c) Where an air gap separates a heat shield from a heat-sensitive surface, or an adjacent layer of a heat shield having more than one layer, the top and bottom air gaps shall be vented. Where the heat shield is not horizontal, the opposite upper and lower air gap openings shall be vented. The ventilation openings shall be not less than half the cross-sectional area of the air gap behind the shield.
- (d) Alternatively, heat shield constructions, including safety clearances, between the appliance and a heat-sensitive surface shall be determined by either Appendix A or Appendix B testing.

NOTE: Clause 4.5.2, sets out additional wall-mounted shield requirements for flue systems.

TABLE 3.1
CONSTRUCTIONS AND CLEARANCE FACTORS FOR APPLIANCE
HEAT SHIELDS THAT ARE WITHIN 45° OF THE VERTICAL

Heat shield construction	Minimum air gap dimension(s) mm	Clearance factor
Single layer of continuous material	12	0.40
Single layer of continuous material	25	0.30
Two spaced layers of continuous material	12 + 12	0.20

NOTES:

- 1 Masonry may be used as a heat shield material.
- 2 Where heat shields are used to reduce appliance clearance dimensions, additional flue shielding may also be required (see Clause 4.5.2).

TABLE 3.2
CONSTRUCTIONS AND CLEARANCE FACTORS FOR APPLIANCE
HEAT SHIELDS THAT ARE MORE THAN 45° OF THE VERTICAL

Heat shield construction	Minimum air gap dimension(s) mm	Clearance factor
Single layer of continuous material	12	0.80
Single layer of continuous material	25	0.60

NOTES:

- 1 Masonry may be used as a heat shield material.
- 2 Where heat shields are used to reduce appliance clearance dimensions, additional flue shielding may also be required (see Clause 4.5.2).

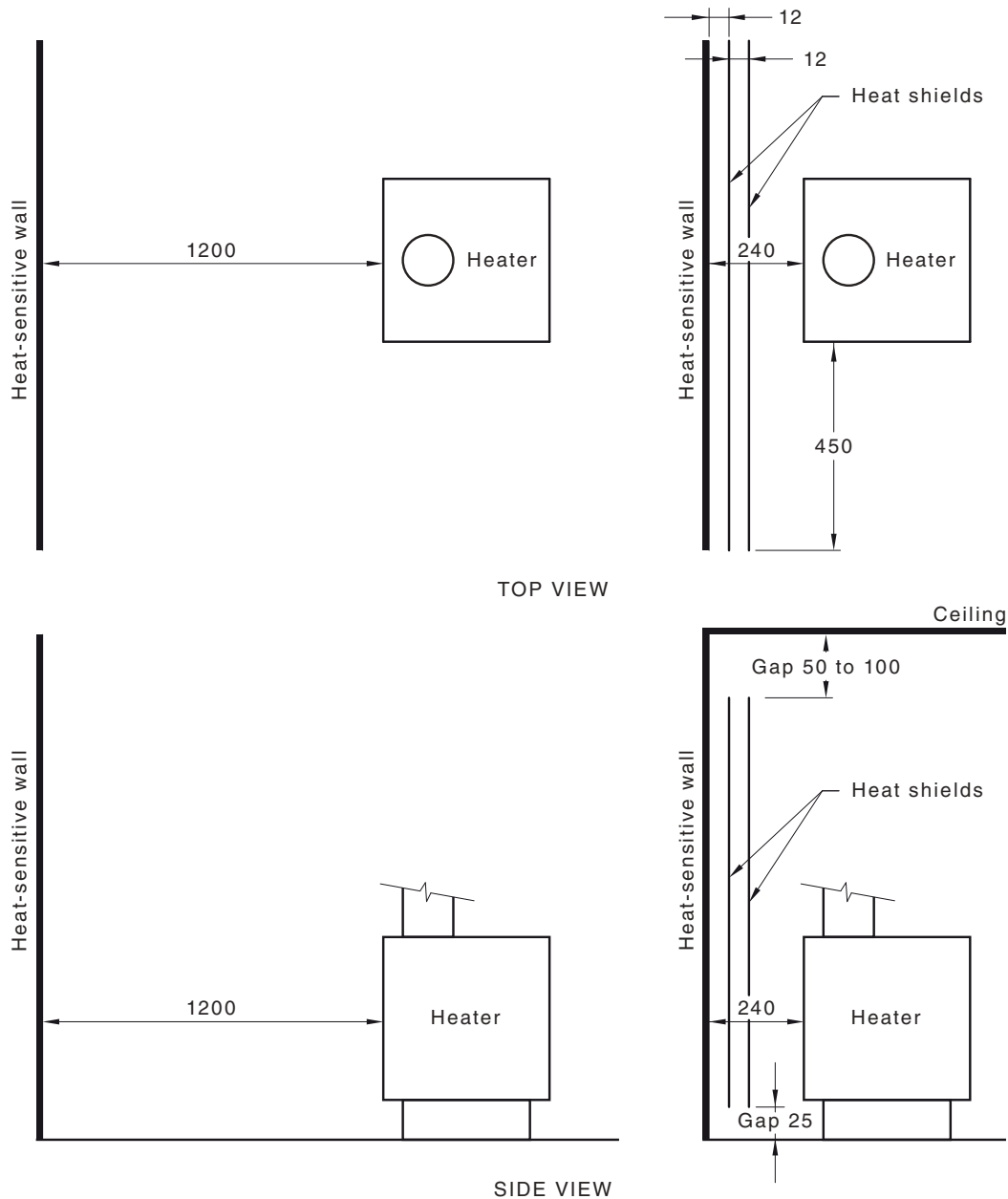


Figure not to scale

(a) Untested appliance double heat shield—2 × 12 mm ventilated air gaps

NOTE: The safety clearance of an untested appliance multiplied by clearance factor for double heat shield equals reduced clearance, e.g. 1200 mm [see Clause 3.2.2(b)] × 0.2 (see Table 3.1) = 240 mm. In this case, the heat shield is less than 250 mm from the appliance and so is constructed of heat-resistant material.

DIMENSIONS IN MILLIMETRES

FIGURE 3.1 (in part) EXAMPLES OF THE USE OF HEAT SHIELDS TO REDUCE APPLIANCE CLEARANCE WHERE THE SHIELDING IS WITHIN 45° OF THE VERTICAL

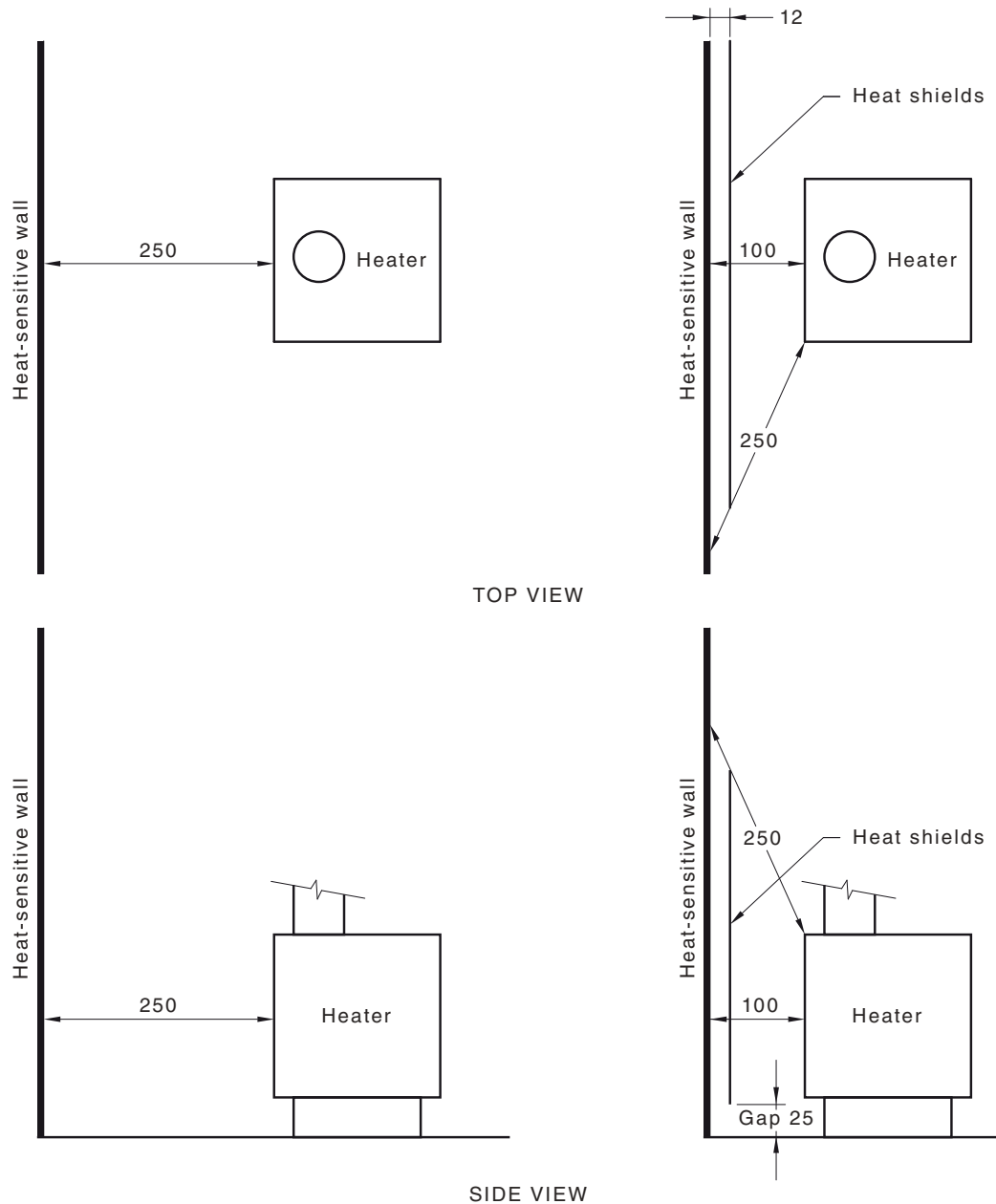


Figure not to scale

(b) Tested appliance single heat shield—12 mm ventilated air gaps

NOTE: Safety clearance, as specified for a particular appliance by test, multiplied by clearance factor for a single heat shield equals reduced clearance, e.g. 250 mm [see Clause 3.2.2(a)] $\times$ 0.4 (see Table 3.1) = 100 mm, in this case, the heat shield is less than 250 mm from the appliance and so it is constructed of heat-resistant material.

DIMENSIONS IN MILLIMETRES

FIGURE 3.1 (in part) EXAMPLES OF THE USE OF HEAT SHIELDS TO REDUCE APPLIANCE CLEARANCE WHERE THE SHIELDING IS WITHIN 45° OF THE VERTICAL

3.2.4 Heat tolerant and non-continuous materials

The minimum allowable clearance between the appliance and either a heat-sensitive wall or a heat-shield, when using heat-tolerant or non-continuous materials, shall be determined by either Appendix A testing, or further reduced by Appendix B testing, whenever the shield's material is—

- (a) made of a heat-tolerant material where Appendix C testing establishes a safe service temperature of less than 250°C; or
- (b) made of a heat-tolerant material located less than 250 mm from the appliance; or
- (c) not continuous, such as perforated materials.

NOTE: See Table 3.1 or 3.2 for requirement for continuous materials.

In each case, the shield's material safe service temperature, as established by Appendix C testing, shall not be exceeded.

Unless otherwise determined by testing, the shield's construction, in terms of sizing, air gap and ventilation, shall be in accordance with Clause 3.2.3.

NOTES:

- 1 Appendix A uses a hot plate at 500°C during the test, whereas Appendix B uses the actual appliance, which may yield more favourable results.
- 2 Ensure that the heat shield's service temperature will not exceed the allowable service temperature of the shield's protective finish (e.g. powder coatings).

3.3 FLOOR PROTECTOR

3.3.1 General requirements

Where any part of the floor area where the appliance is to be installed includes a heat-sensitive material that would be under the appliance or within 500 mm of the appliance, the appliance shall be installed on a floor protector.

NOTE: The floor protector may be an integral part of the appliance.

Distances shall be measured horizontally from the external surface of the appliance with any doors and ash-removal trays closed, disregarding knobs, controls, ash spill trays, and other minor projections. The floor protector shall be horizontal or inclined upwardly away from the appliance.

Where the floor protector consists of a number of components, it shall include a continuous layer of heat-resistant material extending under the appliance to the perimeter of the floor protector. All joints shall be fixed to prevent accidental separation, and shall be sealed to prevent any spilt ash or embers contacting any heat-sensitive material.

3.3.2 Performance and construction requirements for a floor protector where a sample installation has been tested

The maximum surface temperature rises specified in Appendix B shall apply for commonly used flooring materials only. Alternative floor protector, heat-resistant material may be used, provided the thermal properties are equivalent to or better than the tested material.

NOTE: Flooring materials with high heat-sensitivity, e.g. plastics materials, may necessitate a reduction of the specified maximum temperatures.

For an appliance other than a fireplace insert appliance, the floor protector shall extend under the appliance and not less than 300 mm beyond the front of the fuel-loading and ash-removal openings. The width of the floor protector shall be not less than the width of the appliance and shall extend not less than 200 mm from each side of any ash-removal or fuel-loading openings unless the floor protector forms an abutment with a wall or heat shield at a lesser distance. For a fireplace insert appliance, the floor protector shall extend not less than 300 mm beyond the front of the fuel-loading and ash removal openings. The width of the floor protector shall be not less than the width of the appliance and shall extend not less than 200 mm from each side of any ash-removal or fuel-loading openings unless the floor protector forms an abutment with a wall or heat shield at a lesser distance.

For an appliance having a ventilated airspace of not less than 100 mm between the base of the firebox and the floor protector, a heat-resistant material shall be used for the top surface of the floor protector.

NOTE: Heat-tolerant material may be used for other components.

The floor protector shall be constructed of heat-resistant material.

3.3.3 Construction requirements for a floor protector where a sample appliance installation (or prototype appliance installation) has not been tested

Where a sample appliance installation has not been tested, the floor protector shall extend either to a distance of not less than 1000 mm beyond any part of the appliance or a lesser distance at which it forms an abutment with a wall or heat shield (subject to the requirements of Clause 3.2), and shall be constructed as follows:

- (a) For an appliance having a ventilated airspace not less than 50 mm between the base of the firebox and the floor protector, the floor protector shall conform to either of the following:
 - (i) It shall be in accordance with the requirements of Appendix D.
 - or*
 - (ii) It shall be constructed to a thickness of not less than 75 mm (see Clause 3.3.4) of masonry or concrete laid on a supporting sheet of continuous heat-resistant material. The floor protector shall be separated from the floor by means of heat-resistant spacers forming an air gap of not less than 25 mm between the floor protector and the floor or floor covering. Total plan area of the air gap shall be not less than 90% of the area of the floor protector. Openings shall be provided along at least one pair of opposite edges of the floor protector to ventilate the air gap. The total opening area at each edge of the floor protector along which openings are provided shall be not less than that determined from the following equation:

$$A = s \times 3 \quad \dots 3.3.3(1)$$

where

A = minimum total opening area along one edge of the floor protector, in square millimetres

s = perimeter of the floor protector, in millimetres

NOTES:

- 1 For example, a 2 m × 2 m floor protector has a perimeter of 8000 mm. The minimum open area along one edge is $8000 \times 3 = 24\,000 \text{ mm}^2$. For a 25 mm air gap, the length has to be not less than 960 mm (i.e. about half the length of the edge of the hearth).
- 2 For a typical installation, see Figure 3.2.

- (b) For a fireplace insert appliance, the front floor protector shall conform to either of the following:

- (i) It shall be in accordance with the requirements of Appendix D and of the same construction as that beneath the appliance.

or

- (ii) It shall be constructed of continuous heat-tolerant material not less than 30 mm thick. The top surface of the floor protector shall be of heat-resistant material not less than 0.2 mm thick. The floor protector shall be separated from the floor by means of heat-resistant spacers forming an air gap of not less than 25 mm between the floor protector and the floor or floor covering. Total plan area of the air gap shall be not less than 90% of the area of the floor protector. Openings shall be provided along at least one pair of opposite edges of the floor protector to ventilate the air gap. The total opening area at edge of the floor protector along which openings are provided shall be not less than that determined from the following equation:

$$A = s \times 2 \quad \dots 3.3.3(2)$$

where

A = minimum total opening area along one edge of the floor protector, in square millimetres

s = perimeter of the floor protector, in millimetres

- (c) Where the appliance operates with a fire built directly on the floor protector, or the airspace between the base of the firebox and the floor protector is less than 50 mm, the floor protector shall be constructed of hollow concrete blocks laid in two courses each of height not less than 90 mm and arranged so that the hollow cores in the two courses are at right angles to each other and will allow air circulation through them. A sheet of continuous heat-resistant material shall be placed on top of or between the two courses.

NOTES:

- 1 For a typical installation, see Figure 3 4.
- 2 A floor protector shown to be equivalent when tested in accordance with Appendix D may be used.

3.3.4 Decorative finishing

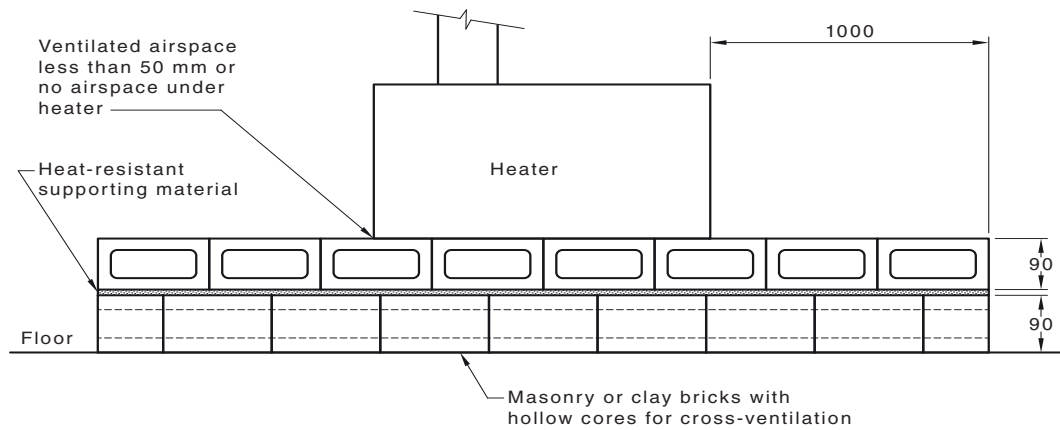
Excluding any area where a fire may be built directly on the floor protector, the top and sides of the floor protector may be finished with a decorative surface, provided the materials from which the decorative surface is constructed are heat-resistant.

Air gaps relative to the floor protector shall not be enclosed.

NOTE: Where the top of the floor protector is finished with a decorative surface, the thickness of the decorative surface may be regarded as contributory to the total thickness of the floor protector for the purpose of determining conformity with the requirements of Clause 3.3.3.

3.3.5 Design load capacity

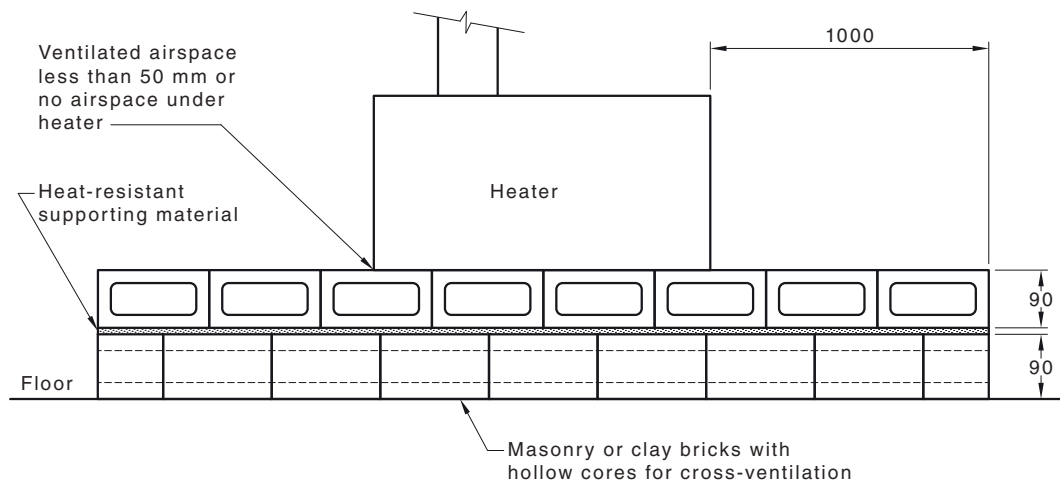
The strength of the floor protector shall support the heater installed on it without damage or distortion.



NOTE: Seismic restraints may be required (see Clause 3.8).

DIMENSIONS IN MILLIMETRES

FIGURE 3.2 TYPICAL FLOOR PROTECTOR CONSTRUCTION FOR AN APPLIANCE NOT TESTED IN ACCORDANCE WITH APPENDIX B WHERE THE FIREBOX BASE IS NOT LESS THAN 50 mm ABOVE THE FLOOR PROTECTOR



NOTE: Seismic restraints may be required (see Clause 3.8).

DIMENSIONS IN MILLIMETRES

FIGURE 3.3 TYPICAL FLOOR PROTECTOR CONSTRUCTION FOR AN APPLIANCE NOT TESTED IN ACCORDANCE WITH APPENDIX B WHERE A FIREBOX BASE IS LOCATED DIRECTLY ON THE FLOOR PROTECTOR

3.4 PARTICULAR REQUIREMENTS FOR FIREPLACE INSERT AND BUILT-IN APPLIANCES

3.4.1 Fireplace insert appliances

3.4.1.1 *Fireplace inserts in fireplaces*

Before installing the appliance, the fireplace and chimney shall be thoroughly cleaned and inspected to ensure they are in a sound condition.

NOTE: The relevant building code should be used as a guide when assessing the condition of the fireplace and chimney.

In Australia, a flue pipe shall be installed within the chimney in accordance with the requirements of Clause 4.11.

In New Zealand, a flue pipe shall be installed within the chimney in accordance with the requirements of Clause 4.11. Where compliance with the *New Zealand Building Code* requirements in relation to separation between the outer surfaces of the chimney and heat-sensitive materials cannot be confirmed, the appliance and flue system shall be tested to, and be in accordance with the requirements of, Appendix E, but need not be tested to Appendix B.

3.4.1.2 *Fireplace inserts in masonry enclosures*

Before installing the appliance, the enclosure shall be thoroughly cleaned and inspected to ensure it is in a sound condition.

The top of the enclosure shall be capped, and the capping shall be at least 5 mm thick steel plate or at least 12 mm thick heat-resistant material.

Where the flue system passes through the capping of the enclosure, the flue shall be double cased and ventilated through the capping, the ventilation coming from inside the enclosure. The lower end of the outer casing shall be close fitting against the enclosure capping.

Ventilation of not less than 10 000 mm² shall be provided near the base of the enclosure to allow a through-flow of cooling air into the enclosure and up through the flue casing.

The outer casing shall have the clearances to heat-sensitive material, as specified in Clause 4.5.

NOTE: For a typical installation, see Figure 3.4.

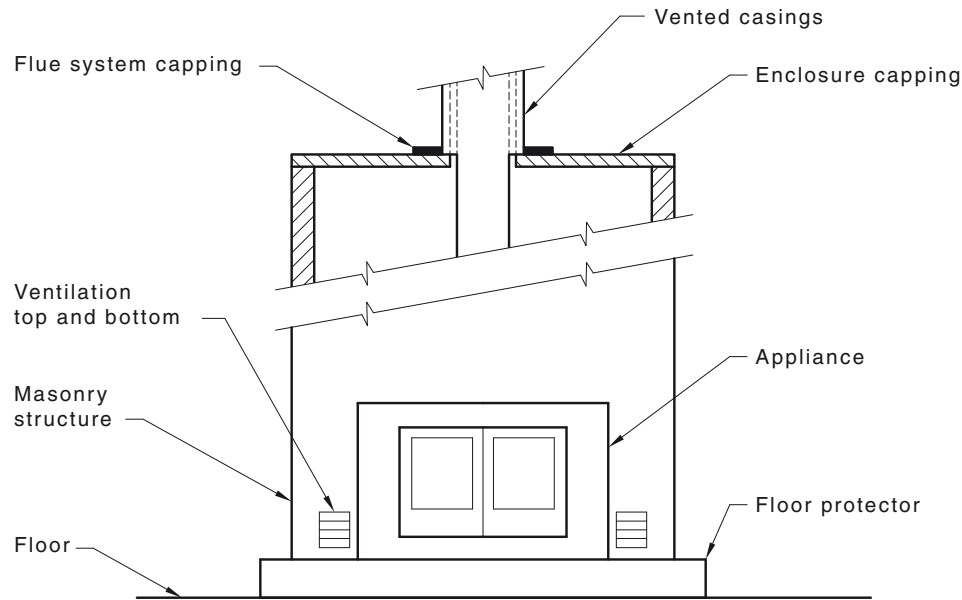


FIGURE 3.4 TYPICAL INSERT APPLIANCE INSTALLATION INTO A MASONRY ENCLOSURE

3.4.1.3 *Safety clearances for fireplace inserts*

Unless reduced by the provision of heat shielding (see Clause 3.2.3), the clearance between the appliance and any heat-sensitive material shall be one of the following, as appropriate:

- (a) Where a sample installation has been tested in accordance with Appendix B or Appendix E, as appropriate, any clearance that does not allow the temperature rise of the corresponding surface of the structure to exceed the temperature specified in Appendix B, Paragraph B10, for Australia or Appendix E, Paragraph E10, for New Zealand, as appropriate, during the high fire and flash fire tests, as applicable.
- (b) Where a sample installation has not been tested in accordance with Appendix B or Appendix E, not less than 1000 mm from the top of the hot air outlet of the appliance to any heat-sensitive material, e.g. a mantelshelf, situated above the appliance, and not less than 300 mm from the outside surface of the appliance firebox

NOTE: For an illustration of the above, see Figure 3.5.

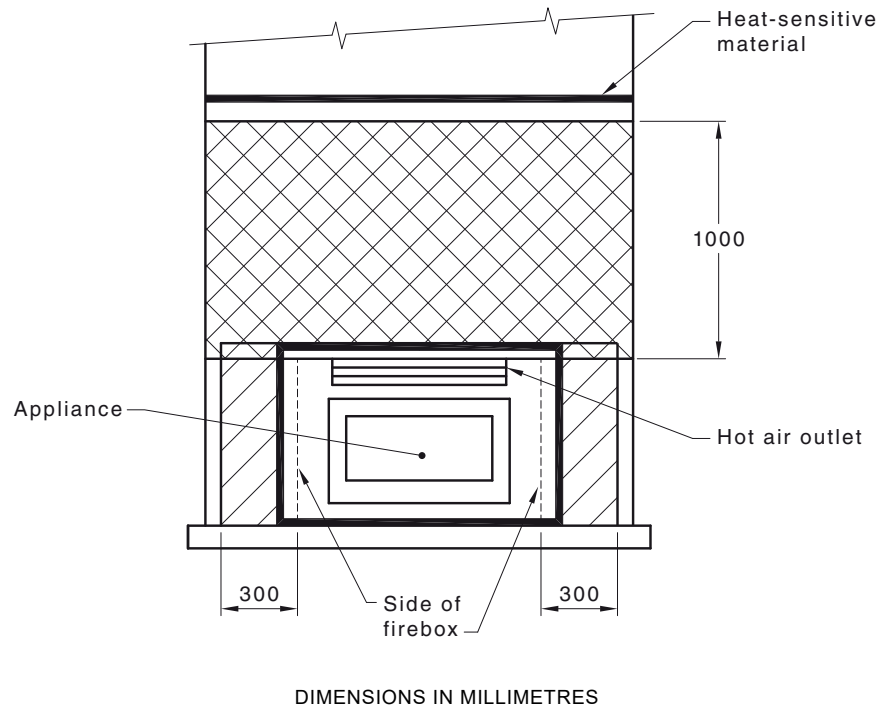


FIGURE 3.5 HEAT-SENSITIVE MATERIALS EXCLUSION ZONES

3.4.1.4 Heat shield

Safety clearances specified in Clause 3.4.1.3 may be reduced, providing heat shielding is provided in accordance with Clause 3.2.3

3.4.1.5 Mantelshelf heat shield

Heat shields under a mantelshelf shall extend over and beyond the appliance for at least 200 mm towards each end of the mantelshelf or to the ends of the mantelshelf, whichever is the lesser. The heat shielding shall abut the wall and extend to the front edge of the mantelshelf. The heat shielding shall be manufactured from heat-tolerant or heat-resistant materials.

3.4.2 Built-in appliance installations**3.4.2.1 General**

In general, a built-in appliance design shall imitate a fireplace and involve open fronted steel insert type or enclosed slow combustion wood burning appliance.

NOTE: A typical design involves installation of a wood burning appliance into an additional enclosure made of metal or non-combustible material called zero-clearance box/cabinet. This additional enclosure may be designed to be in contact with the heat-sensitive structure of the building (see Figure 3.9 for examples of built-in cavities)

Built-in appliance installations shall be tested in accordance with Appendix B and shall be in accordance with the temperature limits specified in Paragraph B10, Appendix B. If a zero clearance box/cabinet is used when testing a built-in appliance to Appendix B, the results are applicable to only that particular built-in appliance. A zero clearance box/cabinet shall be tested with each model appliance with which it is to be installed.

3.4.2.2 Ventilation requirement for chimney chase/facade or false chimney

A chimney chase structure shall have obstruction-free, vermin-proof air vents to supply obstruction-free air both at the bottom and the top termination point in order to ventilate the chimney chase cavity. Ventilation openings of not less than 10 000 mm² free space shall be provided near the base and the top of the enclosure. Flue casing ventilation shall not be considered part of the free space requirement. Any external vent shall be weatherproof.

There shall be no combustibles on top of chimney chase terminations.

NOTES:

- 1 For typical chimney chase construction for built-in appliance, termination chase vented through casing and termination chase vented through side vent, see Figures 3.6, 3.7 and 3.8.
- 2 Air-tight chimney structure can accumulate rising hot air leading to fire hazard. 10 000 mm² is based on insert installation rule.

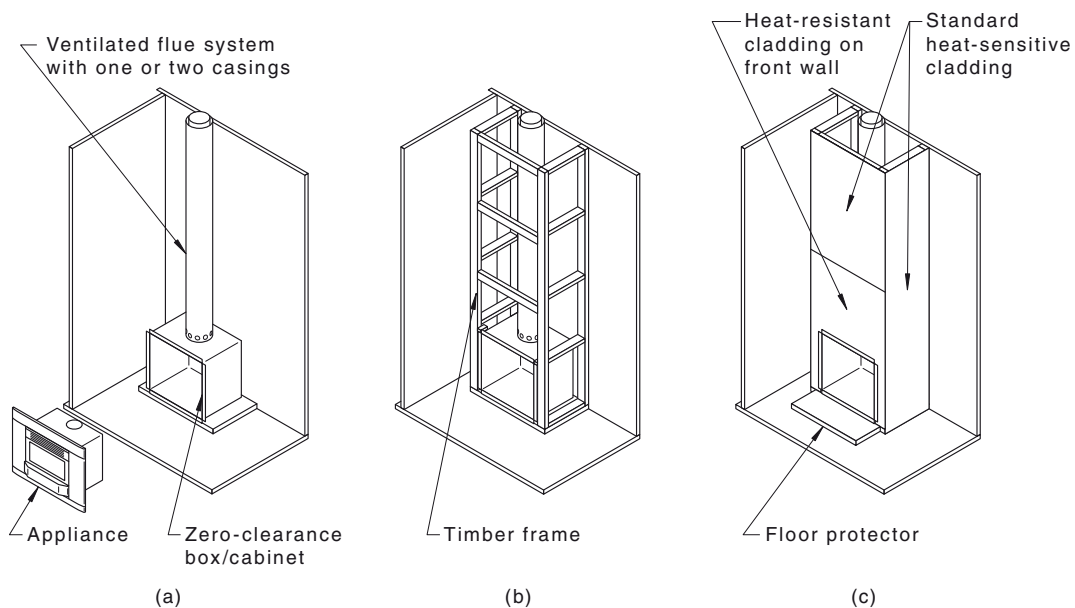


FIGURE 3.6 TYPICAL CHIMNEY CHASE CONSTRUCTION FOR BUILT-IN APPLIANCE

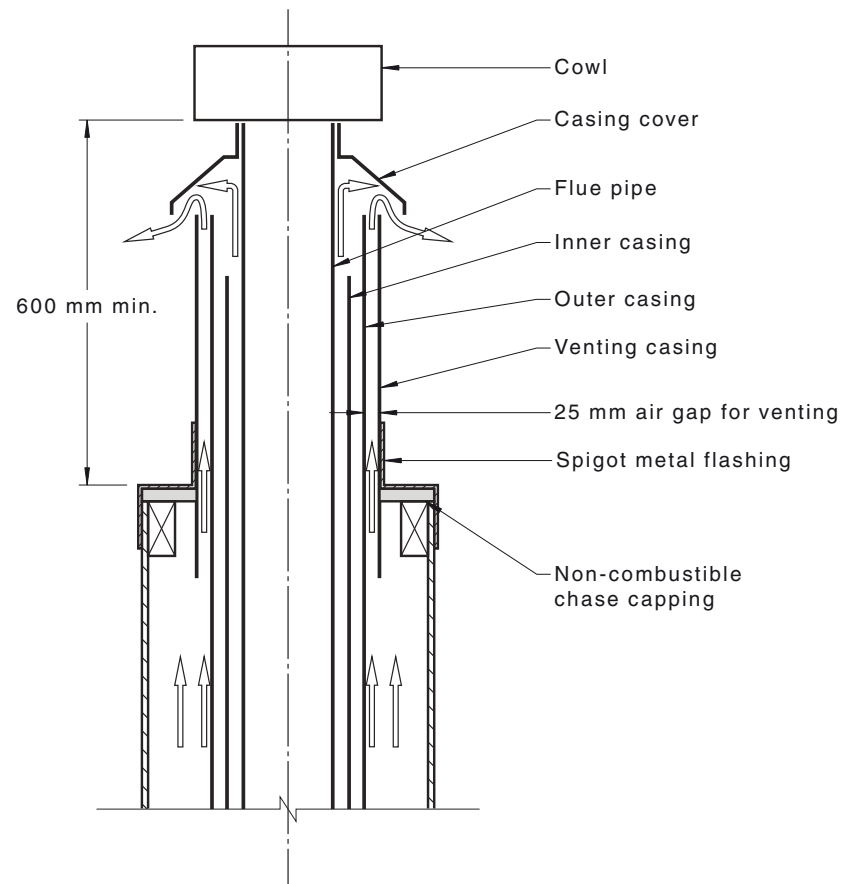


FIGURE 3.7 TYPICAL TERMINATION CHASE
VENTED THROUGH CASING

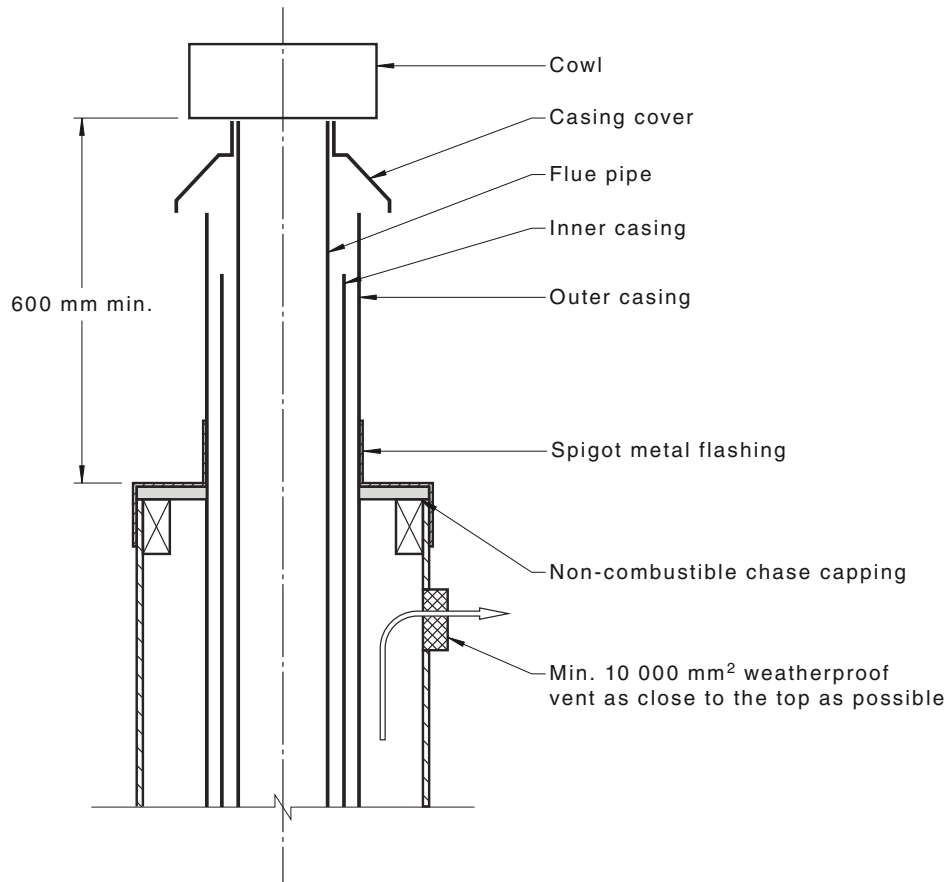
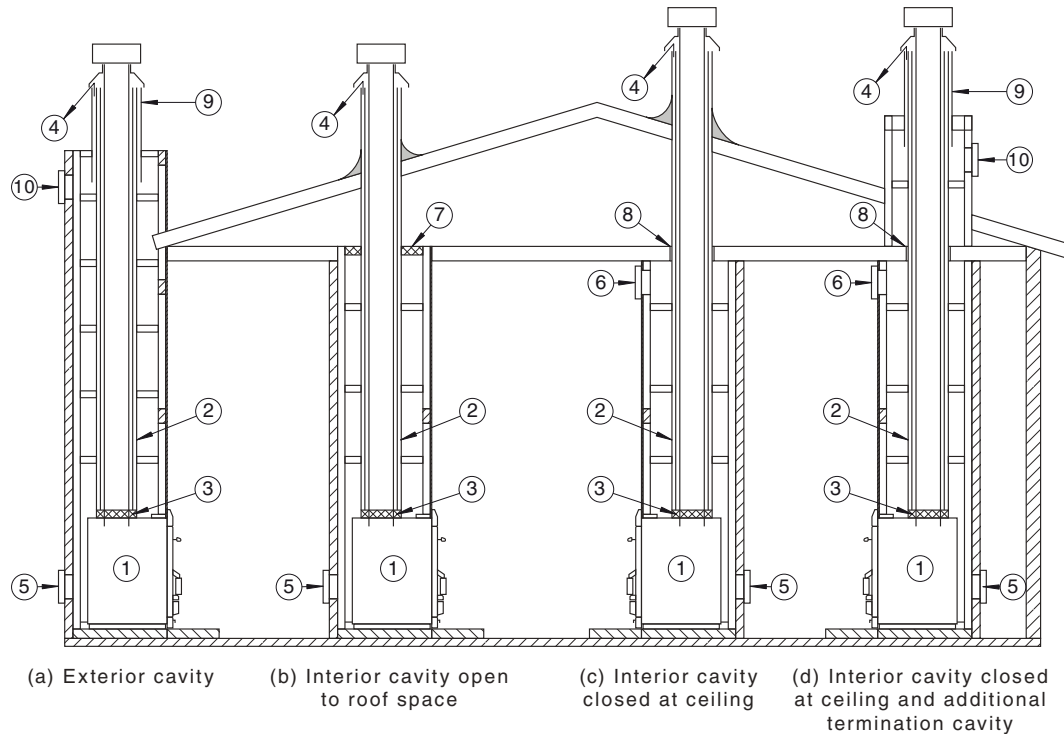


FIGURE 3.8 TYPICAL TERMINATION CHASE VENTED THROUGH SIDE VENT

**LEGEND:**

- | | |
|---|--|
| 1 Appliance with zero-clearance cabinet | 6 Room vent—interior hot air outlet |
| 2 Vented flue system with two casings | 7 Ceiling vent—vermin proof mesh |
| 3 Flue system air inlet | 8 Vented ceiling penetration |
| 4 Flue system air outlet | 9 Venting through casing |
| 5 Bottom vent—cool air inlet | 10 Top side vent to built-in structure |

FIGURE 3.9 SCHEMATIC DIAGRAM FOR BUILT-IN CAVITIES**3.4.2.3 Flue systems for built-in appliance installation**

A flue system for a built-in appliance shall be in accordance with one of the following requirements:

- (a) When tested in accordance with Appendix F, the temperature rise above ambient temperature of monitored surfaces shall not exceed 65°C for the hot flue test, and 100°C for the flue fire test.
- (b) It shall have a ventilated double unperforated casing in accordance with the requirements of Clause 4.5.1.2(b) (see Note 1).

The distance from the top of the flue pipe to the top of the chimney chase shall be a minimum of 600 mm (for example, see Figure 3.7 or 3.8).

NOTE: Casings should extend to the point determined by Appendix B tests.

3.4.2.4 Built-in appliance mantelshelves

Unless a specific mantelshelf arrangement has been shown to be satisfactory during Appendix B testing, mantelshelf arrangements specified for fireplace insert appliances may be used.