

AS/NZS 1905.1:1997

Australian/New Zealand Standard[®]

**Components for the protection of
openings in fire-resistant walls**

Part 1: Fire-resistant doorsets

STANDARDS AUSTRALIA ✓

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This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee BD/19, Fire Doors. It was approved on behalf of the Council of Standards Australia on 20 December 1996 and on behalf of the Council of Standards New Zealand on 20 December 1996. It was published on 5 March 1997.

The following interests are represented on Committee BD/19:

Australian Chamber of Commerce and Industry
Australian Chamber of Manufacturers
Australian Building Codes Board
Australian Fire Protection Association
Building Owners and Managers Association of Australia
Building Research Association New Zealand
Commonwealth Fire Board
CSIRO, Division of Building, Construction and Engineering
Fire Protection Industry Association of Australia
Metal Trades Industry Association of Australia
New Zealand Fire Protection Association

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Australian/New Zealand Standard[®]

Components for the protection of openings in fire-resistant walls

Part 1: Fire-resistant doorsets

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee BD/19, Fire Doors, to supersede AS 1905.1—1990, and NZS 4232.1:1988, *Performance criteria for fire-resisting enclosures, Part 1: Internal and external fire doorsets*.

In this edition, the requirements for certification and tagging of the installed fire-resistant doorsets have been more clearly identified. The Sections dealing with design requirements, variations from the tested specimen, and installation have been revised to more closely reflect acceptable current practices.

The requirements for maintenance of fire-resistant doorsets are covered in AS 1851.7, *Maintenance of fire protection equipment, Part 7: Fire-resistant doorsets*, although reference is made in Section 6 of this Standard to maintenance record systems.

Reference to fire-resistant access panels has been deleted and will be the subject of a separate Standard. Reference to transom panels is included in this Standard.

New Zealand building codes and practice differ to those of Australia in regard to marking, identification and associated documentation, referred to in Section 6. Where such variations occur, appropriate departure clauses have been added.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Components for the protection of openings in fire-resistant walls****Part 1: Fire-resistant doorsets**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies requirements for the construction and installation of fire-resistant doorsets used to protect openings in walls and partitions which are required to resist the passage of fire.

This Standard also applies to transom panels over doors, where the panels are contained within the doorframe and form part of the doorset.

This Standard does not apply to lift-landing doors.

NOTES:

- 1 Where it is intended to install the fire-resistant doorset in high traffic areas, it is recommended that it be tested in accordance with Appendix A prior to fire testing and that it complies with the requirements set out therein.
- 2 Durability designations for locksets and methods for their cycle testing, for minimal, moderate and high frequency usage, are given in AS 4145.2.
- 3 Manufacturers of fire-resistant doorsets are strongly encouraged to implement quality control systems in accordance with AS/NZS ISO 9002.
Guidance on the introduction and maintenance of suitable quality systems is given in AS/NZS ISO 9000 and AS/NZS ISO 9004.
- 4 Guidance on information that should be supplied with an enquiry or order is given in Appendix B.
- 5 Requirements governing lift-landing doors are given in AS 1735.11 or NZS 4332P, as applicable.
- 6 A panel above a doorset, which is not contained within the door frame, is considered as being part of the wall and is therefore subject to the structural adequacy, integrity and insulation requirements set out in the Building Code.
- 7 A transom or mullion within a door frame may be permanently fixed to the side members of the frame or may be removable by means of mechanical fixing.
- 8 A smoke control system (or other external environmental conditions) can impose forces greater than 5 N on the strike. In such circumstances a substantially greater resistance force may be required of the strike to ensure the door remains in the latched position during a fire emergency.

1.2 APPLICATION This Standard is intended to complement the fire-protection requirements of the Building Code of Australia and the New Zealand Building Code, and provides only minimum requirements.

1.3 OBJECTIVE The objective of this Standard is to provide manufacturers, suppliers and installers with a set of requirements for the construction and installation of fire-resistant doorsets designed to protect the openings in walls and elements of construction which are required to resist the passage of fire.

1.4 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

- 1428 Design for access and mobility
- 1428.1 Part 1: General requirements for access—Buildings
- 1530 Methods for fire tests on building materials, components and structures
- 1530.1 Method 1: Combustibility test for materials
- 1530.3 Method 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release
- 1530.4 Method 4: Fire-resistance test of elements of building construction
- 1603 Automatic fire detection and alarm systems
- 1603.1 Part 1: Heat detectors
- 1603.2 Part 2: Point type smoke detectors
- 1670 Automatic fire detection and alarm systems—System design, installation and commissioning
- 1735 Lifts, escalators and moving walks (known as the SAA Lift Code)
- 1735.11 Part 11: Fire-rated landing doors
- 1851 Maintenance of fire protection equipment
- 1851.7 Part 7: Fire-resistant doorsets
- 1890 Thermally-released links
- 2270 Plywood and blockboard for interior use
- 2271 Plywood and blockboard for exterior use
- 2484 Fire—Glossary of terms
- 2484.1 Part 1: Fire tests
- 3600 Concrete structures
- 3700 Masonry in buildings (known as the SAA Masonry Code)
- 4085 Automatic sliding door assemblies
- 4145 Locksets
- 4145.1 Part 1: Glossary of terms
- 4145.2 Part 2: Mechanical locksets for doors in buildings
- B194 Tapping and metallic drive screws

AS/NZS

- ISO 9000 Quality management and quality assurance standards
- ISO 9002 Quality systems—Model for quality assurance in production, installation and servicing
- ISO 9004 Quality management and quality system elements

NZS

- 2139 Specification for heat actuated fire detector
- 3611 Specification for exterior plywood
- 3612 Specification for interior plywood
- 4239 Automatic sliding door assemblies
- 4332P Non-domestic passenger and goods lifts

NZS

- 4512 Fire alarm systems in buildings
- 4541 Automatic fire sprinkler systems

ISO	
834	Fire-resistance tests—Elements of building construction
3008	Fire-resistance tests—Door and shutter assemblies
3009	Fire-resistance tests—Glazed elements
BS	
476	Fire tests on building materials and structures (all Parts)

NOTE: Where separate national Standards apply, cross-reference to these Standards in the text is designated 'AS XXXX or NZS YYYY, as applicable'. Compliance with this Standard is therefore achieved by reference to the Standard that is applicable to the country in which this Standard is being used.

1.5 DEFINITIONS For the purpose of this Standard, definitions given in AS 2484.1 and those below apply. (See also Figures 1.5.1, 1.5.2 and 1.5.3.)

1.5.1 Approved—approved by the regulatory authority having jurisdiction.

1.5.2 Asymmetric leaf—a door leaf not having symmetrical laminar construction face to face.

1.5.3 Automatic—where applied to a fire-resistant doorset, designed to close when activated by a sensing device in accordance with Clause 2.1.6.

1.5.4 Backset—the horizontal distance from the face of the lock to the centre-line of the cylinder, key hole or knob hub.

1.5.5 Building Code—in Australia, means the Building Code of Australia; in New Zealand, means the New Zealand Building Code.

1.5.6 Certifier—a person or organization, acting on behalf of and authorized by the manufacturer, that assumes the responsibility of approving the installation of a fire door in accordance with this Standard.

1.5.7 Combustible—combustible when tested in accordance with AS 1530.1.

1.5.8 Doorset—a complete assembly comprising—

- (a) the door leaf or leaves including any glazing and other inbuilt features;
- (b) the door frame, if any, with its fixings to the wall and, for a sliding doorset, with all guides and their respective fixings to the lintel, wall or sill;
- (c) any fixed panel and its associated transom or mullion (including the methods of fixing) which is contained within the door frame; and
- (d) all door hardware.

1.5.9 Doorstop—that part of a door frame against which the door leaf stops.

1.5.10 Double-acting doorset—a doorset whose leaf is equally capable of opening in either direction, usually having no stop in its frame. It may be single-leafed or multi-leafed.

1.5.11 Essential latching components—the latching components which are critical for latching the doorset and which comprise—

- (a) the latch bolt;
- (b) the strike; and
- (c) the bolt-retaining plate.

1.5.12 Facings and edgings—the surface covering and all perimeter strips of the door leaf, including their methods of fixing.

1.5.13 Fire-resistance level (FRL) (also known as fire-resistance rating (FRR))—the appropriate grading period in minutes, established in the standard fire test and applied to an element of building construction for the three criteria of—

- (a) structural adequacy;
- (b) integrity; and
- (c) insulation;

and expressed in that order, noting that the structural adequacy criterion is not applied to fire doorsets.

NOTE: The standard fire test applies a fourth criterion, radiation, to fire-resistant doorsets dampers and glazing, but the radiation grading period is not included in the statement of fire-resistance level given on the door-tag. Refer to the relevant Building Code for details about the use of the radiation criterion.

1.5.14 Fire-resistant doorset—a doorset which, except when varied as permitted by this Standard, is identical in assembly, construction and installation with a specimen doorset that has been submitted to the standard fire test, and has fulfilled all the relevant test requirements.

NOTE: Fire-resistant doorsets are commonly referred to as 'fire doors'.

1.5.15 Formal opinion—the written opinion by a registered testing authority in Australia or a recognised authority in New Zealand, prepared in accordance with Clause 4.3 of this Standard.

1.5.16 Full-scale test—the standard fire resistance test carried out on a full-sized door set (used to distinguish from a pilot test).

1.5.17 Furniture (door)—visible items or parts of door hardware which may not be essential for the correct operation of the doorset.

1.5.18 Hardware (door)—a broad term used to group all items that are fitted or related to doors and includes hinges, pivots, sliding door track assemblies, locks, latches, snibs, panic exit devices, closers, pull handles, sequence selectors, bolts, reed switches, buffers, power transfers, hold-open devices, any part of an automatic closing device which is attached to the doorset, and all (door) furniture.

1.5.19 Heat-actuated device—a device which is operated by an increase in air temperature to effect the closure of an automatic fire-resistant doorset.

1.5.20 Latch handle—the operating device (e.g. knob, lever) which effects the retraction of the latch bolt.

1.5.21 Manufacturer—an organization or individual who manufactures the fire door leaves or fire doorsets, or both.

1.5.22 Mullion—a vertical bar dividing sections of a panel over a doorset within the door frame other than the door leaf. Refer to 'transom panel'.

1.5.23 Pilot test—a fire test of a representative section of a doorset, in a furnace complying with AS 1530.4 but having the furnace opening not less than 900 mm × 900 mm. The clearances between the specimen and the walls, floor and ceiling of the furnace, are permitted to be reduced from those specified in AS 1530.4, in order to ensure that the size of the pilot specimen is representative. Pilot tests are used to provide information towards the determinations of hardware and other variations.

1.5.24 Recognized authority—a recognised authority is a registered testing authority which, for Australia, means—

- (a) CSIRO Division of Building Construction and Engineering (CSIRO-DBCE);

- (b) an authority registered by the National Association of Testing Authorities (NATA) to test in the relevant field; or
- (c) an organization outside Australia recognized by NATA through a mutual recognition agreement.

In New Zealand, the authority having jurisdiction may accept other testing authorities, individuals or organizations as being capable of conducting fire tests or of providing formal opinions on fire-resistant doorsets for installation in New Zealand.

1.5.25 Registered testing authority—a testing authority registered in accordance with the Building Code of Australia for the purpose of determining the fire resistance of doorsets or as capable of preparing formal opinions on fire-resistant doorsets.

1.5.26 Regulatory authority—an authority administering acts of Parliament or regulations under such acts.

1.5.27 Self-closing—equipped with a device designed to bring the door leaf to the fully closed position immediately after each opening or on release of the hold-open device, and to latch it if applicable.

1.5.28 Similar construction—a door leaf having the same core materials and form of construction which is capable of achieving a fire-resistance level at least the equivalent of the tested assembly.

1.5.29 Specimen doorset—a doorset which has been submitted to the standard fire test in order to establish its fire-resistance level.

1.5.30 Sponsor—an organization or individual that submits a specimen fire-resistant doorset to a registered testing authority in Australia or a recognized authority in New Zealand for testing in accordance with the standard fire test.

1.5.31 Standard fire test—the fire-resistance test specified in AS 1530.4, or other fire-resistant test recognized by the Building Code.

NOTE: AS 1530.4 is the recognized test in both Australia and New Zealand; however, the New Zealand Building Code also recognizes BS 476, ISO 834, ISO 3008 and ISO 3009.

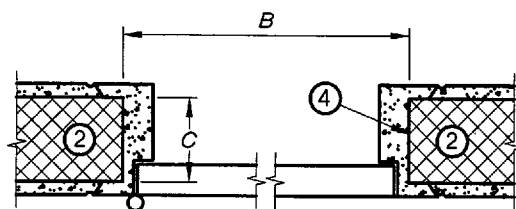
1.5.32 Tested specimen—a specimen doorset which, when subjected to the standard fire test, fulfils all the relevant test requirements.

1.5.33 Through components—door hardware which penetrates (through) the door leaf.

1.5.34 Transom panel—a panel mounted within the door frame above the door leaf or leaves; such a panel may be fitted above a transom member which forms part of the door frame or the panel may be fitted directly above the door leaf.

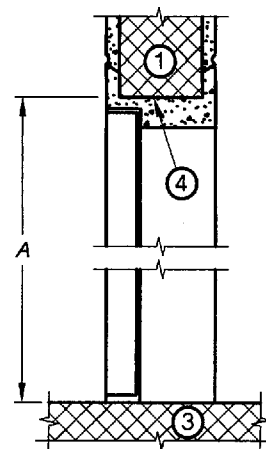
1.5.35 Walls of concrete construction—reinforced concrete walls constructed in accordance with AS 3600.

1.5.36 Walls of masonry construction—brick or concrete block walls constructed in accordance with AS 3700.



SECTION Y-Y

(a) Terms relating to the opening



SECTION X-X

LEGEND:

Nomenclature

Doorset opening

- 1 = Head
- 2 = Jamb
- 3 = Sill
- 4 = Wall opening

Door frame

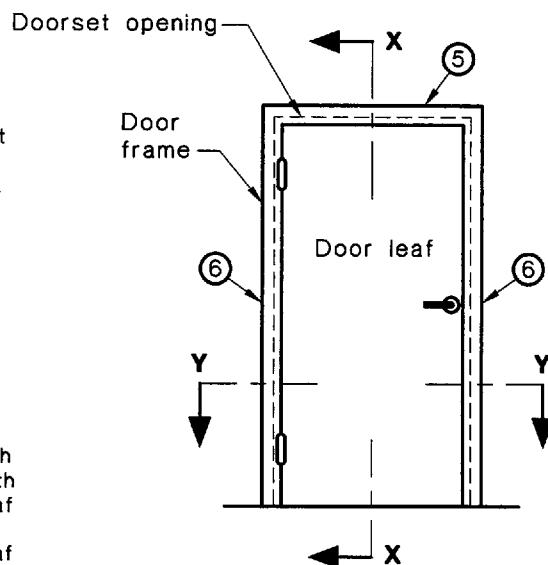
- 5 = Head
- 6 = Jamb
- 7 = Door seat rebate
- 8 = Door frame anchors
- 9 = Door sill
- 10 = Architrave faces

Door leaf

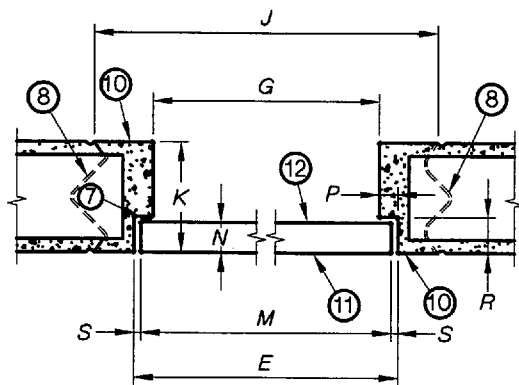
- 11 = Opening face
- 12 = Closing face

Dimensions

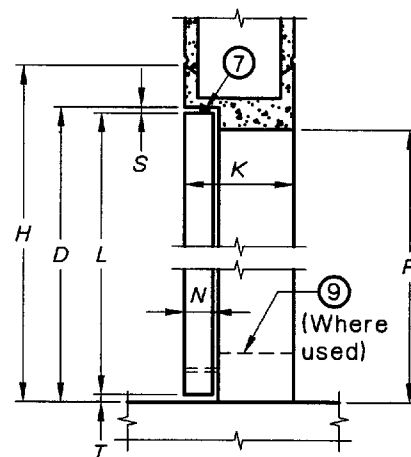
- A = Doorset opening height
- B = Doorset opening width
- C = Doorset opening depth
- D = Door opening height
- E = Door opening width
- F = Clear opening height
- G = Clear opening width
- H = Door frame height
- J = Door frame width
- K = Door frame depth
- L = Door leaf height
- M = Door leaf width
- N = Door leaf thickness
- P = Door seat rebate width
- R = Door seat rebate depth
- S = Clearance between leaf and frame
- T = Clearance between leaf and finished floor



FRONT VIEW

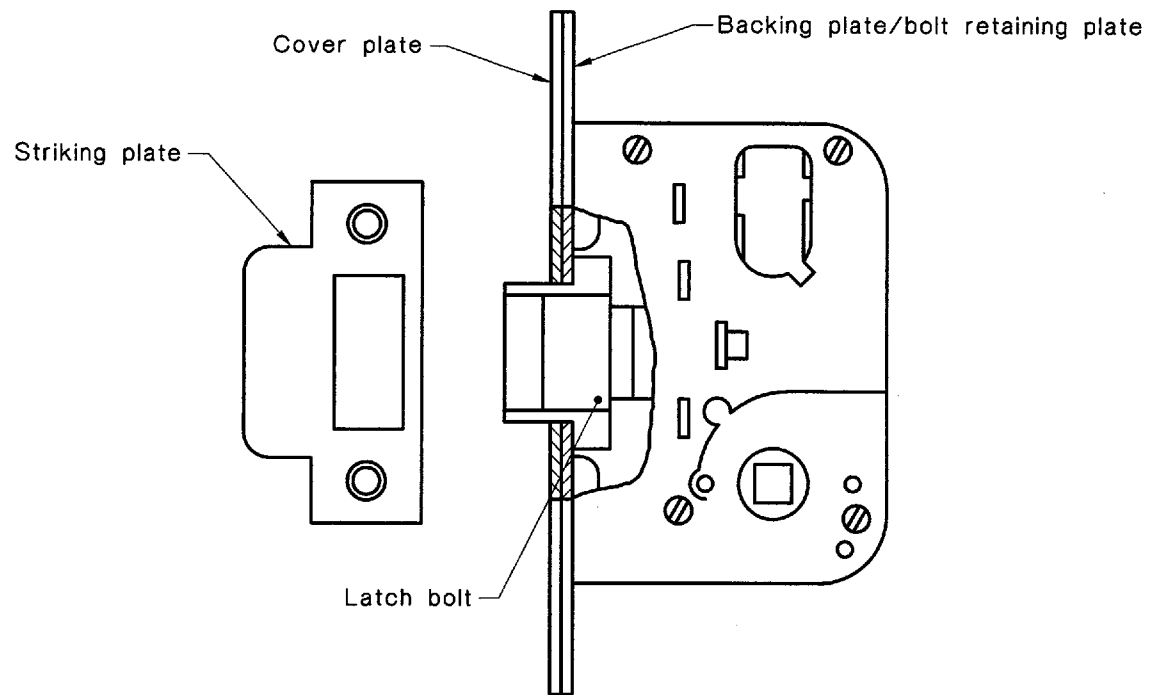


(b) Terms relating to the doorset

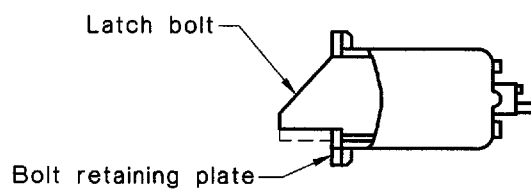


SECTION X-X

FIGURE 1.5.1 TERMS RELATING TO SIDE-HUNG FIRE-RESISTANT DOORSETS

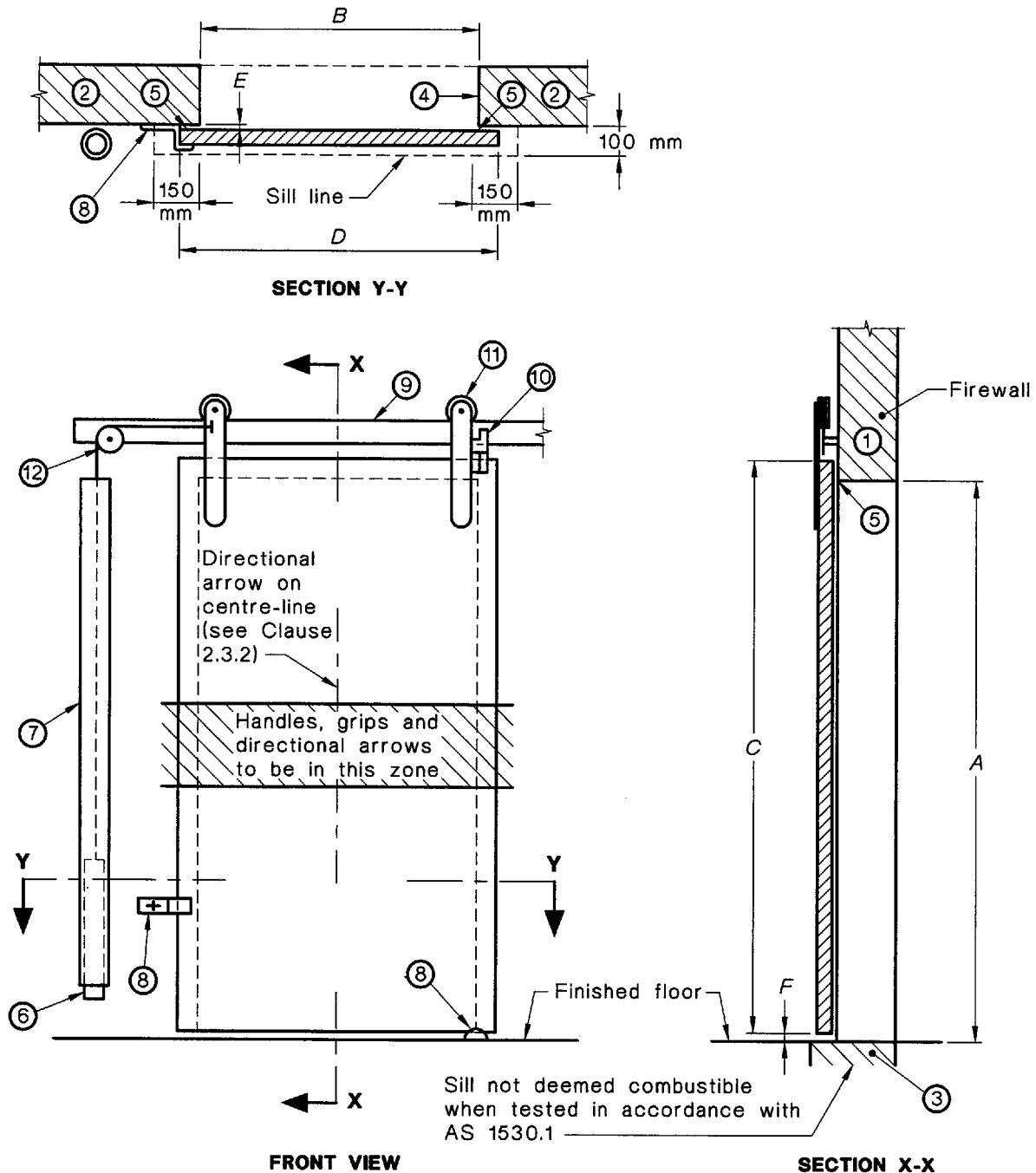


(a) Mortice latch



(b) Tubular latch

FIGURE 1.5.2 TERMS RELATED TO LATCHSET IN SIDE-HUNG
FIRE-RESISTANT DOORSETS

**LEGEND:****Nomenclature***Doorset opening*

- 1 = Head
- 2 = Jamb
- 3 = Sill
- 4 = Wall opening
- 5 = Overlap of opening

Door leaf

- 6 = Counterweight
- 7 = Counterweight guard
- 8 = Guides
- 9 = Suspension system
- 10 = Jumper bracket
- 11 = Carriage
- 12 = Pulley

Dimensions

- A = Clear opening height
- B = Clear opening width
- C = Door leaf height
- D = Door leaf width
- E = Wall clearance
- F = Floor clearance

FIGURE 1.5.3 TERMS RELATING TO SLIDING FIRE-RESISTANT DOORSETS

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SECTION 2 DESIGN REQUIREMENTS

2.1 GENERAL

2.1.1 Materials Unless otherwise specified by the regulatory authority or in this Section, no restriction shall be imposed on the materials of construction of the doorset, provided that the tested specimen satisfies the requirements of this Standard.

NOTE: The use of asbestos may be prohibited by regulatory authorities.

2.1.2 Self-closure The doorset shall be self-closing or automatic. Automatic doorsets shall revert to self-closing on operation of a sensing device installed in accordance with the requirements of Clause 5.6.3, or on the loss of power to the electromagnetic hold-open device.

2.1.3 Selection of hardware

2.1.3.1 General All hardware, including furniture, shall function so that the door leaf or door leaves are self-latching and shall be of a quality capable of withstanding the anticipated use.

2.1.3.2 Self latching A bolt or function which could render a door leaf non-self-latching shall not be incorporated.

2.1.3.3 Locksets Locksets shall be suitable for the purpose with particular attention being given to durability and ease of operation.

NOTE: AS 4145 provides a means of achieving the requirements of Clause 2.1.3.3.

2.1.3.4 Electric bolts Electrically operated bolts shall be self-latching in the event of power failure.

2.1.3.5 Sequencers Selective sequence closing devices are required for doorsets in pairs having rebated meeting stiles, or single bevel latches, to ensure self-closure and latching of both leafs. Refer to Clause 5.6.5.

NOTES:

- 1 A non-self-latching bolt (e.g. a barrel bolt) will prevent the door from closing if left protruding while the door is open.
- 2 Requirements for the installation of hardware are given in Clause 5.6.

2.1.4 Clearances Clearances between the leaf and frame, finished floor and wall shall comply with Clause 5.5.

2.1.5 Wall openings The design of wall openings shall be such that no structural loads are imposed on the door frame unless the frame has demonstrated its ability to sustain the loads under the conditions of the standard fire test.

2.1.6 Sensing device The sensing device shall be of a type suitable for that particular application and shall comply with the appropriate Standards listed in Table 2.1.

TABLE 2.1
SENSING DEVICE REQUIREMENTS

Sensing device	Compliance requirements
Thermally released	AS 1890—air-oven test for temperature rating $\leq 80^{\circ}\text{C}$
Thermal detectors	AS 1603.1 or NZS 2139, as applicable
Smoke detectors	AS 1603.2

NOTES:

- 1 Refer to AS 1670 or NZS 4512, as applicable, for guidance on the selection of detectors for particular applications.
- 2 Refer to the relevant Building Code for specific requirements concerning activation by a sprinkler system.

2.2 SIDE-HUNG DOORS, INCLUDING DOUBLE-ACTING DOORSETS

2.2.1 Width of door seat rebate The width of the door seat rebate shall be determined by a fire-resistance test.

NOTE: In the past, a minimum rebate width of 25 mm was required for doorsets having a fire resistance level of -/60/30 or greater. This larger than usual rebate facilitated the segregation of fire door frames from other door frames during construction.

2.2.2 Hinges and pivots

2.2.2.1 General Hinges and pivots shall be accurately aligned so that the door leaf swings freely without bias in the opening direction. Hinge flaps shall be fixed in accordance with Clause 5.6.1. Unless other materials are demonstrated by the standard fire test to be satisfactory, hinges shall be made of steel or stainless steel.

2.2.2.2 Frictional forces Except for doorsets incorporating floor or head springs (for which the testing of frictional forces is not practicable), when continuously applied perpendicular to the face of the door leaf at a radius of 700 mm from the pivot centre, and before the closer arm is attached, the force required—

- (a) to move the door leaf from the fully closed position to the fully open position and return to the strike shall be not more than 2 N; and
- (b) to bring the door leaf to the fully latched condition shall be not more than 20 N.

2.2.3 Materials for essential latching components Materials used for all essential latching components of side-hung fire-resistant doorsets shall have a melting point as follows:

- (a) Doorsets of integrity up to and including 120 min not less than 890°C .
- (b) Doorsets of integrity in excess of 120 min not less than 1030°C .

2.2.4 Closer pressure relief All closers that incorporate—

- (a) packing gland type pressure seals;
- (b) an O-ring seal with a backup seal; or
- (c) cup seals with a backup seal;

shall incorporate a vent, plugged with material of temperature of fusion below 100°C and located above the level of oil in the hydraulic chamber.

2.2.5 Cushioned back-checking action of the closer The self-closure system shall provide a cushioned back-checking action to prevent shock when the door is forcibly opened. This action shall not commence until the door leaf has opened to not less than 75° degrees, and shall be effective over not less than the last 5 degrees of opening