

**NZS 4520:2010**



New Zealand Standard

# **Fire-resistant doorsets**

Superseding AS/NZS 1905.1:1997

NZS 4520:2010

## Single User PDF Terms & Conditions

You have material which is subject to strict conditions of use. Copyright in this material is owned by the New Zealand Standards Executive. Please read these terms and conditions carefully, as in addition to the usual range of civil remedies available to Standards New Zealand on behalf of the New Zealand Standards Executive for infringement of copyright, under New Zealand law every person who infringes copyright may be liable to a fine of up to \$10,000 for every infringing copy or imprisonment of up to 5 years, or a fine of up to \$150,000 or imprisonment not exceeding 5 years.

You have access to a single-user licence to read this non-revisable Adobe Acrobat PDF file and print out and retain ONE printed copy only.

We retain title and ownership of the copyright in this PDF file and the corresponding permitted printed copy at all times.

Under this license use of both the PDF file and the single permitted printed copy of this PDF file you may make are restricted to you. Under no circumstances are you permitted to save, sell, transfer, or copy this PDF file, the one permitted printed copy of this PDF file, or any part of either of them.

You undertake that you will not modify, adapt, translate, reverse engineer, decompile, disassemble or create derivative works based on any of the downloaded PDF file, nor will you merge it with any other software or document, even for internal use within your organization.

Under no circumstances may this PDF file be placed on a network of any sort without our express permission.

You are solely responsible for the selection of this PDF file and any advice or recommendation given by us about any aspect of this PDF file is intended for guidance only and is followed or acted upon entirely at your own risk.

We are not aware of any inherent risk of viruses in this PDF file at the time that it is accessed. We have exercised due diligence to ensure, so far as practicable, that this file does not contain such viruses.

No warranty of any form is given by us or by any party associated with us with regard to this PDF file, and you accept and acknowledge that we will not be liable in any way to you or any to other person in respect of any loss or damage however caused which may be suffered or incurred or which may arise directly or indirectly through any use of this PDF file.

Regardless of where you were when you received this PDF file you accept and acknowledge that to the fullest extent possible you submit to New Zealand law with regard to this licence and to your use of this PDF file.

Copyright Standards New  
Zealand

COMMITTEE REPRESENTATION

This Standard was prepared under the supervision of the P 4520 Committee the Standards Council established under the Standards Act 1988.

The committee consisted of representatives of the following:

Nominating Organisation	Committee Member
BRANZ	Amanda Robbins
BRANZ	Ed Soja
Department of Building and Housing	Nick Saunders
Fire Protection Association New Zealand	Geoff Willis
Institution of Professional Engineers New Zealand	Jonathan Nyman
Institution of Fire Engineers	Daryn Glasgow
Local Government New Zealand	Vinh Tran
New Zealand Fire Service	Alan Merry
Property Council New Zealand	Michael Huynh

ACKNOWLEDGEMENT

Standards New Zealand gratefully acknowledges the contribution of time and expertise from all those involved in developing this Standard.

COPYRIGHT

The copyright of this document is the property of the Standards Council. No part of the text may be reproduced by photocopying or by any other means without the prior written approval of the Chief Executive Officer of Standards New Zealand unless the circumstances are covered by Part III of the Copyright Act 1994.

Standards New Zealand will vigorously defend the copyright in this Standard. Every person who breaches Standards New Zealand’s copyright may be liable to a fine not exceeding \$50,000 or to imprisonment for a term not to exceed three months. If there has been a flagrant breach of copyright, Standards New Zealand may also seek additional damages from the infringing party, in addition to obtaining injunctive relief and an account of profits.

Published by Standards New Zealand, the trading arm of the Standards Council, Private Bag 2439, Wellington 6140. Telephone: (04) 498 5990; Fax: (04) 498 5994; Website: <http://www.standards.co.nz>.

AMENDMENTS			
No.	Date of issue	Description	Entered by, and date

New Zealand Standard

# **Fire-resistant doorsets**

**Superseding AS/NZS 1905.1:1997**

Copyright Standards New Zealand

## NOTES

Copyright Standards New  
Zealand

# CONTENTS

Committee representation .....	IFC
Acknowledgement .....	IFC
Copyright .....	IFC
Referenced documents .....	5
Foreword.....	6
Outcome statement .....	6
Latest revisions.....	5
Review of Standards .....	6

## Section

1	SCOPE AND GENERAL .....	7
1.1	Scope .....	7
1.2	Application .....	7
1.3	Interpretation .....	7
1.4	Objective .....	8
1.5	Definitions .....	8
1.6	Abbreviations .....	11
2	DESIGN REQUIREMENTS.....	14
2.1	General .....	14
2.2	Side-hung doors, including double-acting doorsets .....	15
2.3	Sliding doorsets .....	16
3	TESTING THE FIRE-RESISTANCE OF FIRE-RESISTANT DOORSETS .....	18
3.1	General .....	18
3.2	Vision panel.....	18
3.3	Latch set.....	18
4	VARIATIONS FROM THE TESTED SPECIMEN .....	19
4.1	General .....	19
4.2	Variations permitted without a formal assessment for fire-resistant doorsets .....	19
4.3	Variations permitted subject to a formal assessment .....	19
4.4	Minimum fire testing required for the preparation of formal assessments on fire doors .....	20
4.5	Formal assessments not requiring additional supporting test data for fire-resistant doorsets .....	22
5	INSTALLATION OF FIRE-RESISTANT DOORSETS .....	23
5.1	General .....	23
5.2	Fixing of door frames .....	23
5.3	Clearances .....	23
5.4	Hardware.....	24
5.5	Final check.....	24

6	MARKING AND DOCUMENTATION .....	26
6.1	General .....	26
6.2	Identification and labelling .....	26
6.3	Information requirements .....	27
6.4	Evidence of compliance .....	28
6.5	Doorset signs .....	29
7	INSPECTION, MAINTENANCE, AND REPORTING .....	30
7.1	General .....	30
7.2	Weekly .....	30
7.3	Monthly .....	30
7.4	Six-monthly .....	30
7.5	Annually .....	30
7.6	Records .....	31

## Appendix

A	Physical testing of fire-resistant doorsets (Informative) .....	32
B	Sensing devices (Informative) .....	36
C	Annual inspection of fire-resistant doorsets for independently qualified person (Informative) .....	37

## Table

B1	Sensing device requirements .....	36
----	-----------------------------------	----

## Figures

1	Terms relating to side-hung fire-resistant doorsets .....	12
2	Terms related to latch set in side-hung fire-resistant doorsets .....	13
3	Terms relating to sliding doorsets .....	17
4	Examples of door frame installations .....	25
5	Example of label information .....	28
C1	Clearances to floor .....	38



## REFERENCED DOCUMENTS

Reference is made in this document to the following:

### NEW ZEALAND STANDARDS

NZS 3101: - - - -	Concrete structures Standard
Part 1:2006	The design of concrete structures
Part 2:2006	Commentary to the design of concrete structures
NZS 4230:2004	Design of reinforced concrete masonry structures
NZS 4512:2010	Fire detection and alarm systems in buildings
NZS/BS 476: - - - -	Fire tests on building materials and structures
Part 22:1987	Methods for determination of the fire resistance of non-loadbearing elements of construction
NZS ISO/IEC 17025:2005	General requirements for the competence of testing and calibration laboratories

### AUSTRALIAN STANDARDS

AS 1428.1:2001	Design for access and mobility – General requirements for access – New building work
AS 1530: - - - -	Methods for fire tests on building materials, components and structures
Part 1:1994	Combustibility test for materials
Part 4:2005	Fire-resistance test of elements of construction
AS 1851:2005	Maintenance of fire protection systems and equipment
AS 1890:1999	Thermally released links
AS 1905: - - - -	Components for the protection of openings in fire-resistant walls
Part 1:2005	Fire-resistant doorsets
AS 5007:2007	Powered doors for pedestrian access and egress

### OTHER PUBLICATIONS

British Board of Agrément	Method of assessment and test (MOAT). Number 7 for internal and external doorsets. United Kingdom, 1970
---------------------------	---

### NEW ZEALAND LEGISLATION

Building Act 2004
Building (Forms) Regulations 2004
Building Regulations and New Zealand Building Code (NZBC) 1992

### WEBSITES

<a href="http://www.legislation.govt.nz">http://www.legislation.govt.nz</a>
<a href="http://www.bbacerts.co.uk">http://www.bbacerts.co.uk</a>

## FOREWORD

The objective of this Standard is to provide manufacturers, suppliers, and installers with minimum requirements for the testing and installation of fire-resistant doorsets designed to protect the openings in walls and elements of construction that are required to resist the passage of fire. It also contains a short set of appendices which contain informative guidance on physical testing of fire-resistant doorsets, the use of sensing devices and annual inspection.

Fire doors (also known as fire-resistant doorsets) play an important role in confining fire and to control fire spread allowing people to escape from fire, New Zealand Fire Service personnel to conduct their operations within the building, and for the protection of other property in some cases.

Requirements for standard configurations and permissible variations are given in this Standard and also referred to in AS 1530.4.

It should be noted that this Standard relates to fire-resistant doorsets only. Testing, installation, and performance of doors or components required to control the passage of smoke are not included within the scope of this Standard.

## OUTCOME STATEMENT

NZS 4520 will continue to help prevent loss of life and provide protection to property in the event of fire by specifying requirements for the design, certification, installation, and maintenance of fire-resistant doorsets used to form part of the passive fire-protection solution in buildings.

## LATEST REVISIONS

The users of this Standard should ensure that their copies of the above-mentioned New Zealand Standards are the latest revisions. Amendments to referenced New Zealand Standards can be found on <http://www.standards.co.nz>.

## REVIEW OF STANDARDS

Suggestions for improvement of this Standard will be welcomed. They should be sent to the Chief Executive, Standards New Zealand, Private Bag 2439, Wellington 6140.

New Zealand Standard

# Fire-resistant doorsets

## 1 SCOPE AND GENERAL

### 1.1 Scope

This Standard specifies requirements for the testing (see Appendix A), installation, and maintenance of fire-resistant doorsets used to protect openings in walls and partitions, which are required to resist the passage of fire. NZS 4520 also applies to transom panels over doors, where the panels are contained within the door frame and form part of the doorset.

This Standard does not apply to lift-landing doors.

NOTE –

- (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) A panel above or to the side of a doorset, which is not contained within the door frame, is considered to be part of the wall and is therefore subject to the structural adequacy, integrity, and insulation requirements set out in the Compliance Documents to the New Zealand Building Code (NZBC).
- (3) A smoke-control system (or other external environmental conditions) can impose forces which may override the strike plate. In such circumstances a substantially greater resistance force may be required of the strike plate to ensure the door remains in the latched position during a fire emergency but without exceeding appropriate door opening forces.

### 1.2 Application

This Standard is intended to complement the fire-protection requirements of the NZBC and to be used with the appropriate clauses of AS 1530.4. This Standard also applies to doors tested to the Standard previously used (AS/NZS 1905.1) provided the tests were carried out prior to the publication of this Standard.

### 1.3 Interpretation

For the purposes of this Standard, the word 'shall' refers to requirements that are essential for compliance with the Standard, while the word 'should' refers to practices that are advised or recommended.

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.

Clauses prefixed by 'C' and printed in italic type on a grey screen are intended as comments on the corresponding clauses. They are not the only or complete interpretation of the corresponding clause. They should be used only for guidance and are not mandatory.

## 1.4 Objective

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

## 1.5 Definitions

For the purpose of this Standard the definitions below apply. See also figure 1 and figure 2.

<b>Applicant</b>	An organisation or individual who sponsors a test in accordance with this Standard
<b>Astragals</b>	A member or combination of members applied to one or both doors of a pair at their meeting edges to close the clearance gap for the purpose of either providing a weather seal, minimising the passage of light or sound between doors or retarding the passage of smoke or flame during a fire
<b>Automatic</b>	Where applied to a fire-resistant doorset, designed to close when activated by a sensing device in accordance with 2.1.2
<b>Building consent authority (BCA)</b>	Has the meaning assigned to it by the Building Act
<b>Combustible</b>	The classification of a material based on its reaction to defined elevated temperature conditions and which has been subjected to the test conditions in AS 1530.1 and has exceeded flaming or temperature rise limits specified in that Standard, that is, classified as 'deemed combustible' by that test
<b>Doorset</b>	<p>A complete assembly comprising:</p> <ul style="list-style-type: none"><li>(a) The door leaf or leaves including any glazing and other inbuilt features;</li><li>(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;</li><li>(c) Any fixed panel and its associated transom or mullion (including the methods of fixing) which is contained within the door frame; and</li><li>(d) All door hardware</li></ul>
<b>Doorstop</b>	That part of a door frame against which the door leaf stops
<b>Double-acting doorset</b>	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

<b>Essential latching components</b>	<p>The components which are critical for keeping the door closed</p> <p>NOTE – Electromagnetic clamp mechanisms are not considered essential latching components under this Standard since they do not necessarily keep the door closed during power failure.</p>
<b>Facings and edgings</b>	<p>The surface covering and all perimeter strips of the door leaf, including their methods of fixing</p>
<b>Fire-resistance rating (FRR)</b>	<p>The nominal grading period, in minutes, that is determined by subjecting a specimen to the standard time temperature curve regime as set out in AS 1530.4 and NZS/BS 476.22, to specify:</p> <ul style="list-style-type: none"> <li>(a) Structural adequacy or stability (which does not apply to doorsets);</li> <li>(b) Integrity; and</li> <li>(c) Insulation</li> </ul> <p>which are expressed in that order</p> <p>NOTE – For example, a door with an FRR of -/60/30 will maintain, when tested in accordance with AS 1530.4:</p> <ul style="list-style-type: none"> <li>(i) Structural adequacy (which does not apply to doorsets)</li> <li>(ii) Integrity for a period of 60 min</li> <li>(iii) Insulation for a period of 30 min.</li> </ul>
<b>Fire-resistance test</b>	<p>A method to determine the ability of an element of construction, component, or structure to fulfil, for a stated period of time, the required structural adequacy or stability, integrity, insulation, or other expected attribute during exposure to the standard fire-resistance test regime as specified in AS 1530.4 and NZS/BS 476.22</p>
<b>Fire-resistant doorset</b>	<p>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 fire-resistance test, and has fulfilled all the relevant test requirements</p> <p>NOTE – Fire-resistant doorsets are commonly referred to as 'fire doors'.</p>
<b>Formal assessment</b>	<p>A document prepared by a competent person, experienced in both testing and writing laboratory reports, on fire-resistant doors of similar construction to that proposed. Also known as an 'opinion'</p>
<b>Full-scale test</b>	<p>The standard fire-resistance test carried out on a full-sized doorset (used to distinguish from a pilot test)</p>
<b>Furniture (door)</b>	<p>Visible items or parts of door hardware which may not be essential for the correct operation of the doorset</p>

<b>Hardware (door)</b>	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
<b>Latch handle</b>	The operating device (for example a knob or lever) that effects the retraction of the latch bolt
<b>Mullion</b>	A vertical bar dividing sections of a panel over a doorset within the door frame other than the door leaf (see 'transom panel')
<b>Pilot test</b>	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. Pilot tests are used to provide information towards the determinations of hardware and other variations
<b>Self-closing</b>	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 or the delayed closing action, and to latch it if applicable
<b>Similar construction</b>	A door leaf, having the same core materials and form of construction, that is capable of achieving a fire-resistance level at least the equivalent of the tested assembly
<b>Similar</b>	<p>In relation to door leaves, this shall be restricted to leaves that react to fire in a comparable manner, for example:</p> <ul style="list-style-type: none"> <li>(a) Non-combustible cores with steel reinforcing for the fixing of hardware items, edged and clad to construct a leaf; and</li> <li>(b) Solid timber leaves, of composite or laminated construction, that use intumescent seals to protect the edge gap from fire.</li> </ul> <p>In relation to frame-to-wall sealing systems, where specified in the installation instructions, for:</p> <ul style="list-style-type: none"> <li>(c) Steel frames to masonry walls, any joint sealing mastic-tested to AS 1530.4; and</li> <li>(d) Timber frames to masonry or plasterboard walls, any intumescent mastic tested to AS 1530.4.</li> </ul> <p>Sealants shall be tested to an equivalent FRR and applied as per the manufacturers' recommendations, unless otherwise specified by the doorset manufacturer.</p> <p>In relation to walls, any masonry or concrete construction having the same FRR and similar deflections in a fire resistance test</p>

<b>Tested specimen</b>	A specimen doorset that has been subjected to the standard fire-resistance test in order to establish its FRR
<b>Through components</b>	Door hardware that penetrates (through) the door leaf
<b>Transom panel</b>	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
<b>Walls of concrete construction</b>	Reinforced concrete walls constructed in accordance with NZS 3101
<b>Walls of masonry construction</b>	Brick or concrete block walls constructed in accordance with NZS 4230

## 1.6 Abbreviations

The following abbreviations are used in this Standard:

BCA	Building consent authority
FRR	Fire-resistance rating
IQP	Independently qualified person
Min.	Minute
N	Newtons
NZBC	New Zealand Building Code
O/A	Overall
MOAT	Method of assessment and test



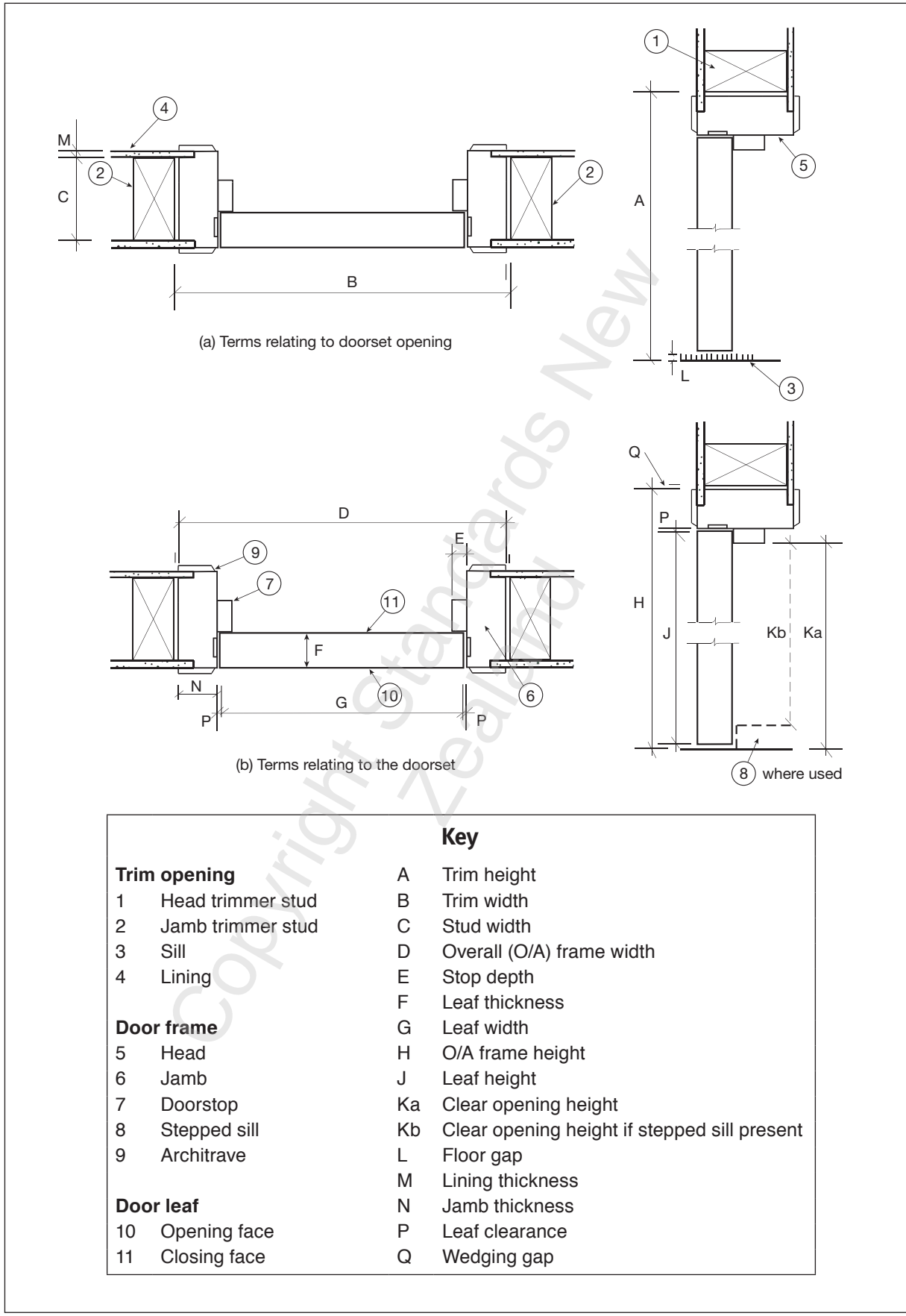


Figure 1 – Terms relating to side-hung fire-resistant doorsets



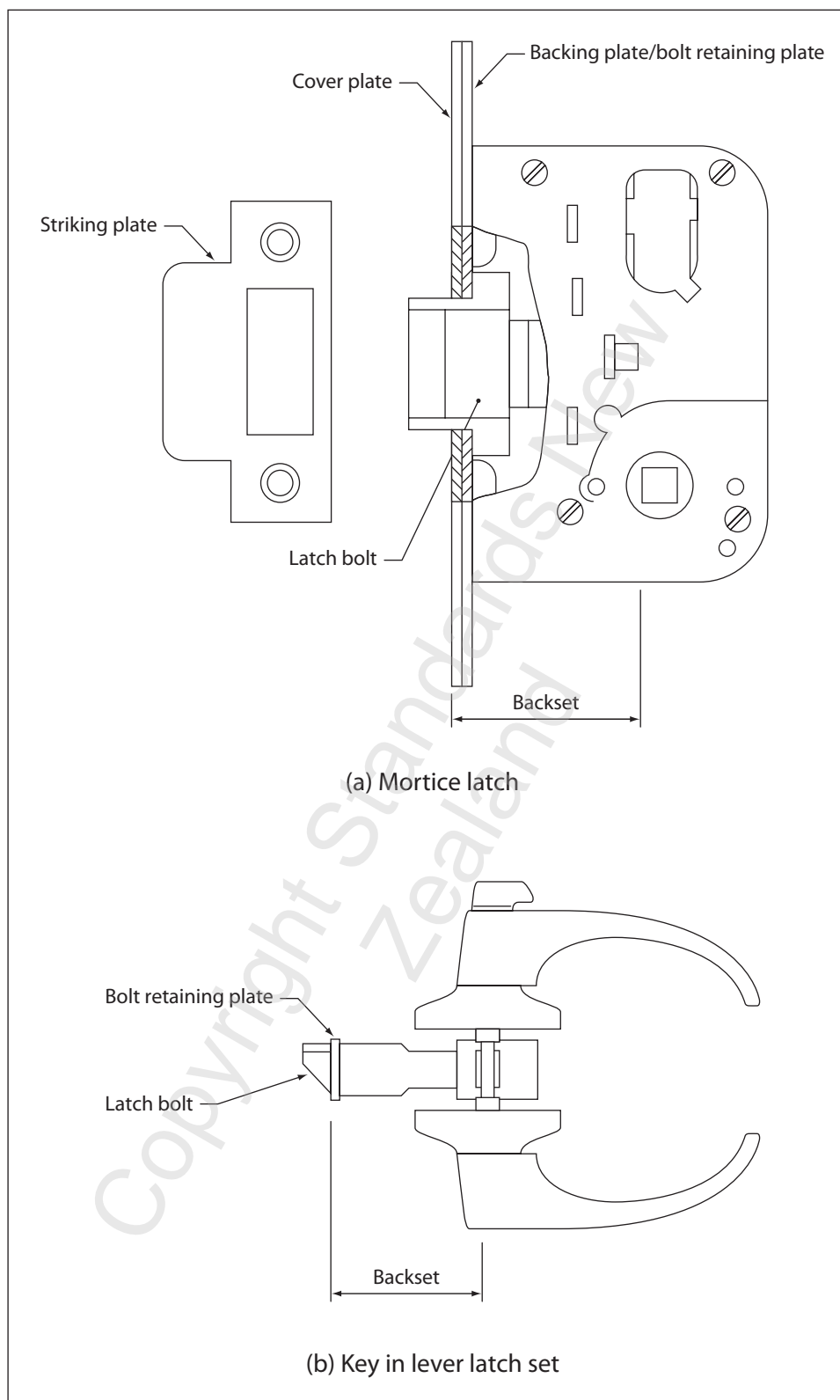


Figure 2 – Terms related to latch set in side-hung fire-resistant doorsets

## 2 DESIGN REQUIREMENTS

### 2.1 General

#### 2.1.1 Materials

Unless otherwise specified 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.

#### 2.1.2 Self-closure

The fire-resistant doorset shall be self-closing or automatic. Automatic doorsets shall revert to self-closing on operation of a sensing device (see Appendix B), or on the loss of power to the electromagnetic hold-open device.

#### 2.1.3 Selection of hardware

Requirements for the installation of hardware are given in 5.4.

##### 2.1.3.1 Self latching

A bolt or function which could in normal usage render a door leaf non self-latching shall not be incorporated.

NOTE – A non self-latching bolt (for example, a dead bolt), will prevent the door from closing if left protruding while the door is open.

##### 2.1.3.2 Lock sets

Lock sets shall be suitable for their purpose with particular attention being given to durability and ease of operation.

##### 2.1.3.3 Electric bolts

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

##### 2.1.3.4 Sequencers

Doorsets in pairs which have rebated meeting strike plates, astragals, or single-bevel latches shall include selective sequence-closing devices to ensure the self-closure and latching of both leaves.

#### 2.1.4 Clearances

Clearances between the leaf and frame, finished floor, and wall shall comply with 5.3.

#### 2.1.5 Wall openings

Wall openings shall be designed so 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 fire-resistance test.

## 2.2 Side-hung doors, including double-acting doorsets

### 2.2.1 Hinges and pivots

#### 2.2.1.1 General

Hinges and pivots shall be aligned so that the door leaf swings with no bias towards the opening direction.

#### 2.2.1.2 Door operational forces for fire doors

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 to:

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

NOTE – These forces exclude the effects of differential building pressures.

### 2.2.2 Closer pressure relief for fire doors

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.

### 2.2.3 Opening shock protection

The self-closure system shall provide a cushioning 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°, and shall be effective over not less than the last 5° of opening (see Note). If an adjustable valve is provided, that valve shall not be capable of preventing the cushioned back-checking action.

NOTE –

- (1) The final angle of effectiveness of the cushioned back-checking action depends on the particular location where each fire-resistant doorset is to be installed.
- (2) For the purposes of fire-resistance testing, it is recommended that the maximum opening angle of the door is assumed to be 90°, and that the tested specimen be set to permit this angle of door opening.

## 2.3 Sliding doorsets

The Building Regulations, the NZBC, and associated Acceptable Solutions and Verification Methods, as well as some specific designs may place restrictions on the use of sliding doors. Where sliding doors are permitted, they shall be in accordance with 2.3.1 to 2.3.4.

### 2.3.1 Flush pulls and grips

Where a finger pull or grip is recessed into the face of the door leaf, and does not provide for a retractable 'D' handle, the recess shall:

- (a) Measure not less than 25 mm wide × 70 mm high; and
- (b) Offer not less than 20 mm depth of finger purchase in a plane normal to the direction of door movement, except that where the recess is undercut by not less than 5° to the plane normal to the direction of door movement, the depth of finger purchase may be reduced to 12 mm.

Where pulls or grips are recessed into both faces of the door leaf, they shall be staggered in their location to give a clear distance of not less than 75 mm between any of their parts. Pulls or grips shall be located vertically so that they are not less than 900 mm nor more than 1200 mm above the finished floor level on the side from which they are visible. Terms relating to sliding doorsets are shown in figure 3.

### 2.3.2 Directional arrows

All sliding fire-resistant doorsets shall be provided with sharply-delineated arrows of the form shown in figure 3, which shall indicate the direction of opening of the door. The surface of such arrows shall be not less than 3 mm above or below the plane of their surround, and the arrows shall be located at the midpoint of the face of each door leaf at a height not less than 900 mm, nor more than 1200 mm, above floor level.

### 2.3.3 Activation mechanism

Where the doorset is automatic the sensing device that activates the door closure or release shall be of a type suitable for that particular application.

### 2.3.4 Automatic closing

Where a sliding fire-resistant doorset is automatic, the operation of the door shall comply with the appropriate provisions of AS 5007, and in particular, the kinetic energy requirement.

NOTE – The total kinetic energy of the door leaf (or leaves) should not exceed 27 joules at any point in the closing cycle.

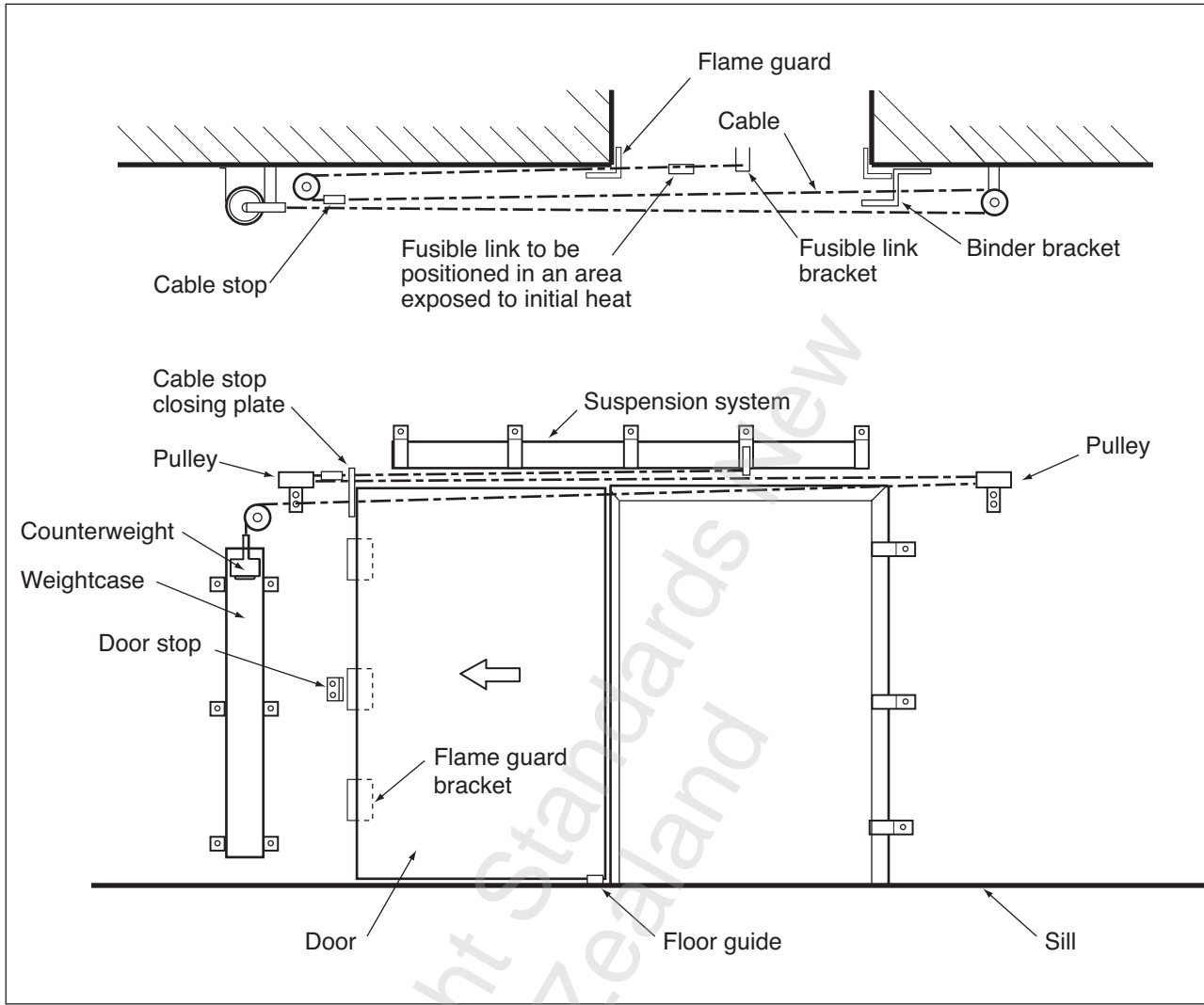


Figure 3 – Terms relating to sliding doorsets

### 3 TESTING THE FIRE-RESISTANCE OF FIRE-RESISTANT DOORSETS

#### 3.1 General

The fire resistance of the doorset shall be determined by submitting a specimen doorset to the fire-resistance test specified in AS 1530.4.

The tests shall be carried out by a test laboratory accredited to NZS ISO/IEC 17025.

NOTE – For pilot tests, where the purpose of the test is to validate a variation, the direction of fire exposure and the specimen mounting may differ from the provisions at full scale. In each instance the mounting and direction may be arranged to gather the data needed for the validation, subject to each feature being examined for the least favourable conditions.

#### 3.2 Vision panel

Where a fire-resistant doorset includes non-insulated vision panel(s) up to a total 65 000 mm<sup>2</sup> clear opening area, the vision panel(s) shall not be taken into account when determining failure for the insulation and radiation criteria of the doorset when subjected to the standard fire test.

#### 3.3 Latch set

The latch bolt shall be designed to provide a positive latching action and remain engaged at the conclusion of the fire test. If the latching cannot be determined by visual examination, the ability to resist a perpendicular force of 20 N shall be an indication of a latched state.

## 4 VARIATIONS FROM THE TESTED SPECIMEN

### 4.1 General

The basis of this Standard is the production and testing of a specimen fire-resistant doorset and the subsequent production and installation of additional fire-resistant doorsets which have equivalent performance to the tested specimen.

Any variations from the tested specimen shall:

- (a) Satisfy the requirements of AS 1530.4 for fire-resistant doorsets;
- (b) Be subject to a formal assessment confirming that the variation is within the requirements of 4.3.

### 4.2 Variations permitted without a formal assessment for fire-resistant doorsets

The circumstances in which variations from the requirements of 4.1 shall be permitted are set out in AS 1530.4.

### 4.3 Variations permitted subject to a formal assessment

#### 4.3.1 General

For fire-resistant doorsets, variations shall be permitted only if supported by a formal assessment that the fire-resistant doorset is capable of achieving the FRR despite the minor departure from the tested specimen, unless the variation is permitted by AS 1530.4.

For fire-resistant doorsets, all formal assessments shall be derived from the results of one or more full-scale fire-resistance tests used as the basis of demonstrating that the doorset would achieve the fire-resistance level if subjected to the fire-resistance test. The minimum fire testing requirements for the preparation of the formal assessment are set out in 4.4.

NOTE – The formal assessment may require more than the minimum testing requirements.

#### 4.3.2 Preparation and presentation of formal assessments

Formal assessments shall be prepared and presented as follows:

Each formal assessment shall be based on one or more full-scale FRR tests and may be supported by one or more pilot tests as specified in AS 1530.4.

- (a) The formal assessment shall be derived directly from the test results, if appropriate, by means of a technical analysis of the effects of the proposed variations in relation to the failure criteria of the fire-resistance test. Other formal assessments may be referred to for clarification or to avoid unnecessary repetition;
- (b) The formal assessment shall include at least the following:
  - (i) Reference to the full-scale test including a general description of the tested item and the specific results achieved relevant to the formal assessment
  - (ii) Reference to other supporting information
  - (iii) A detailed statement of the permissible variation(s)

- (iv) A summary of the critical issues leading to the formal assessment, including the main points of the argument and any assumption made
- (v) Verification that the varied fire-resistant doorset complies with sections 2 and 4.3
- (vi) Details of the organisation requesting the formal assessment
- (vii) A statement of the formal assessment, including the number and date of the Standard against which the fire resistance has been assessed
- (viii) The name of the person and the organisation accepting responsibility for the formal assessment
- (ix) The name of the individual(s) preparing and reviewing the formal assessment together with their signatures and the date
- (x) The name of the assessor preparing the report
- (xi) A statement confirming the assessment is in accordance with 4.4 of this Standard; and
- (c) Formal assessments shall be prepared by competent persons experienced in both testing and writing laboratory reports on fire-resistant doorsets, as appropriate, of similar construction to that proposed.

#### **4.4 Minimum fire testing required for the preparation of formal assessments on fire doors**

##### **4.4.1 General**

For the purposes of this Standard, fire testing required for the preparation of formal assessments falls within one of the following three categories:

- (a) Full-scale testing;
- (b) Full-scale testing or pilot testing; or
- (c) No testing.

Variations other than those specified in 4.4.2, 4.4.3, and AS 1530.4 shall be subjected to the fire-resistance test which shall be either full-scale or pilot as specified in 4.4.2 and 4.4.3.

##### **4.4.2 Full-scale testing**

The requirements for full-scale testing are as follows:

- (a) Change of wall construction – For wall constructions other than masonry or concrete, variation of the wall type or wall system shall not be made unless the doorset has been subjected to a full-scale fire-resistance test in a wall type or system which has been the subject of a full-scale fire test, and has:
  - (i) The same (or more severe) deflection characteristics as the proposed wall
  - (ii) The same frame (and sliding-door track) and wall mounting details on the proposed wall, and
  - (iii) Achieved the required fire-resistance rating;

NOTE – For example, for a drywall system the results obtained for a fire doorset, fire tested in a 64 mm steel-stud partition faced with two layers of 16 mm plasterboard, may be applicable to a similar partition with greater stud depth or greater facing thickness.



- (b) Facing and edging material – Except for the variations permitted by AS 1530.4, variations shall only be made in the materials used for facings and edgings where a full-scale test has been performed on a doorset of the same or equal construction, but with the alternative facing or edging material;
- (c) Door frame packing materials and fixing – Changes shall only be made to the packing materials and the method of fixing of a door frame if the door frame has been subjected to a full-scale fire-resistance test. A full-scale or pilot test of the changes may be required at the discretion of the testing laboratory.

#### 4.4.3 Full-scale testing or pilot testing

For a pilot test the clearances between the specimen and the walls, floor, and ceiling of the furnace may be reduced from those specified in AS 1530.4, in order to ensure that the size of the pilot specimen is representative.

The requirements for full-scale testing or pilot testing are as follows:

- (a) Lockset – A different lockset shall only be substituted for the lockset on the tested specimen if it has been subjected to the fire-resistance test on a doorset of similar construction, or if the essential latching components from the same manufacturer are substituted by those constructed from materials of greater or equal melting point.

The requirements for a full-scale test or pilot test for locksets from the same manufacturer may be waived if:

- (i) There is no increase in the amount of material removed from the door leaf, and
- (ii) The alternative lockset from the same manufacturer on a doorset of the same or equal construction is similar to a lockset that has been subjected to a full-scale test or pilot test and all variations of essential latching components are identified and drawn to the attention of the assessor;
- (b) Panic-exit device – A different panic-exit device shall only be substituted for the panic-exit device on the tested specimen if it has been subjected to the fire-resistance test on a tested doorset of similar construction. Variations to the form and material of architectural hardware may not require fire testing;
- (c) Surface-mounted closers – An alternative surface mounted closer shall not be used unless it is manufactured from the same materials, uses the same operating mechanism design, is of equal or smaller size, and uses the same hydraulic fluids. If the above provisions are not all met, the alternative surface-mounted closer shall comply with the following:
  - (i) For a steel-framed doorset – the closer has been subjected to a full-scale fire-resistance test, or pilot test, installed on the unexposed side of a doorset of similar construction, and a full-scale fire-resistance test has been conducted with a surface-mounted closer or simulated weights, of greater or equal melting point and turning moments, installed on the exposed face of the door leaf
  - (ii) For a timber-framed doorset – the closer has been subjected to a full-scale fire-resistance test or pilot test, installed on the unexposed side of a doorset of similar construction;

- (d) Alternative closers – Door pivots, floor and head springs, and concealed/semi-concealed closers shall only be substituted if supported by test data from a fire test on a doorset of the same construction;
- (e) Vision panel(s) – Vision panel(s) shall only be incorporated in a door leaf without full-scale testing if all of the following requirements are satisfied:

- (i) Vision panel(s) shall not exceed 65 000 mm<sup>2</sup> in area

NOTE – For fire-resistant doorsets including a non-insulated vision panel, it has been established that, provided the vision panel does not exceed 65 000 mm<sup>2</sup>, the received radiation at 365 mm from the panel will not exceed 10 kW/m<sup>2</sup>. For this reason a vision panel up to 65 000 mm<sup>2</sup> is not required to be taken into account when determining failure for the insulation and radiation criteria fire-resistance test in AS 1530.4.

- (ii) The location of the opening shall not encroach on any structural framework of the door leaf in which it is placed
- (iii) A pilot test of a doorset incorporating the vision panel, and similar in construction to the tested specimen, shall demonstrate that, in the formal assessment of an assessor, the inclusion of the vision panel does not prejudice the achievement of the established fire-resistance rating of the tested specimen
- (iv) When considering radiation, reference shall be made to AS 1530.4

The location of an existing vision panel may be varied, provided compliance with the requirements of (e) is maintained;

- (f) Dimensions of vision panel – The proportions of the vision panel shall only be varied by increasing the height of the tested vision panel by up to 50% and when:
  - (i) There is no increase in either the width or the area of the vision panel
  - (ii) The requirements of (e)(iii) are satisfied; and
- (g) Furniture, seals, and other components – Where combustible materials are added or modified or there is a reduction in the melting point of through components, or of fixings and components covering or filling through gaps in the door leaf, the alternative furniture or other components shall have demonstrated, in a pilot test or full-scale test on a doorset of similar construction, that they did not induce failure during the required period.

#### 4.5 Formal assessments not requiring additional supporting test data for fire-resistant doorsets

Additional fire testing may not be required for the preparation of formal assessments in the following instances:

- (a) Increase of overall size of the doorset – The dimensions of the doorset that has been the subject of a full-scale fire-resistance test may be increased without additional fire testing;

- (b) Architrave width of door frame – The width of the architrave of the door frame that has been the subject of a full-scale fire-resistance test may be increased or decreased without additional testing;

NOTE – Reduction in the architrave width of metal frames may limit the range of strike plates/boxes that may be fitted.

- (c) Alternative hinge materials – The materials used in the construction of a previously tested hinge may be varied providing the melting points of the new material are not decreased;
- (d) Number of hinges – The number of hinges may be increased without additional fire testing;
- (e) Where equivalent load-bearing capacity can be demonstrated, steel hinges or door-leaf restraining devices may be interchanged for the centre hinge of a three-hinged system; and
- (f) Furniture and other components – Furniture and other components such as viewing lenses and security plates may be added or deleted without additional testing, subject to the formal assessment (see also 4.4.3).

## 5 INSTALLATION OF FIRE-RESISTANT DOORSETS

### 5.1 General

The method of installation of any fire-resistant doorset shall be the same as that for the tested specimen, except as permitted by 3.2, 3.3, 4.3, and AS 1530.4.

### 5.2 Fixing of door frames

The door frame shall be fixed as in the tested specimen (see section 3) except as permitted in 4.3. See figure 4 for examples of door frame installations.

NOTE – For masonry construction, walling units and lintels should be entered as deeply as practicable into the jamb cavities, and frame head and jamb cavities should be thoroughly and progressively grouted in with cement mortar. In addition, frames built into masonry walling should be provided with corrosion-resistant metal anchors designed to provide jambs with positive rotational restraint about their vertical axes. Such anchors should be of similar type to, and be not less in number or greater in spacing than, those of the tested specimen. In any case, anchors should be built into mortar joints to a depth of not less than 75 mm at spacings not exceeding 400 mm vertically. Where, as construction progresses, the frame is incorporated in the wall, it is recommended that it be thoroughly and progressively grouted with mortar.

### 5.3 Clearances

The clearance dimensions required for fire-resistant doorsets shall be in accordance with the tested specimen.

## 5.4 Hardware

### 5.4.1 Travel-limiting devices

Every side-hung or double-acting fire-resistant doorset shall be protected by means of buffers, stops or other travel-limiting devices, to prevent damage in any installation where the fire-resistant doorset or its accessories could be subjected to forceful or careless operation. The travel-limiting devices shall be located so as to minimise strain or racking of the door leaf.

NOTE – In this context, a door closer is not considered to be a travel-limiting device.

### 5.4.2 Counterweighting system for sliding doors

#### 5.4.2.1 Protection

Where a counterweighting system is used to provide automatic closure of sliding fire-resistant doorsets in a fire, this system shall be protected to ensure free operation by means of adequate guards or enclosures. The counterweights shall be not less than 150 mm clear of the floor in the door-closed position.

#### 5.4.2.2 Adjustment

At the time of installation the counterweighting systems shall be adjusted as follows:

- (a) Where it is necessary to pass through the fire-resistant doorset to reach the required exit, the force required to achieve the following shall not exceed 110 N:
  - (i) To move the door leaf from its closed position
  - (ii) To move the door leaf from its stationary position after the release mechanism has operated
  - (iii) To operate the door leaf through its full travel;
- (b) In other cases, the force required shall be as follows:
  - (i) To move the door leaf from its closed and stationary position after the release mechanism has operated not more than 180 N
  - (ii) To operate the door leaf through its full travel (that is not more than 135 N).

## 5.5 Final check

When the installation is complete, the fire-resistant doorset shall latch satisfactorily from the fully open position and from any intermediate position, and the closers shall demonstrate satisfactory opening shock protection as required by 2.2.3.

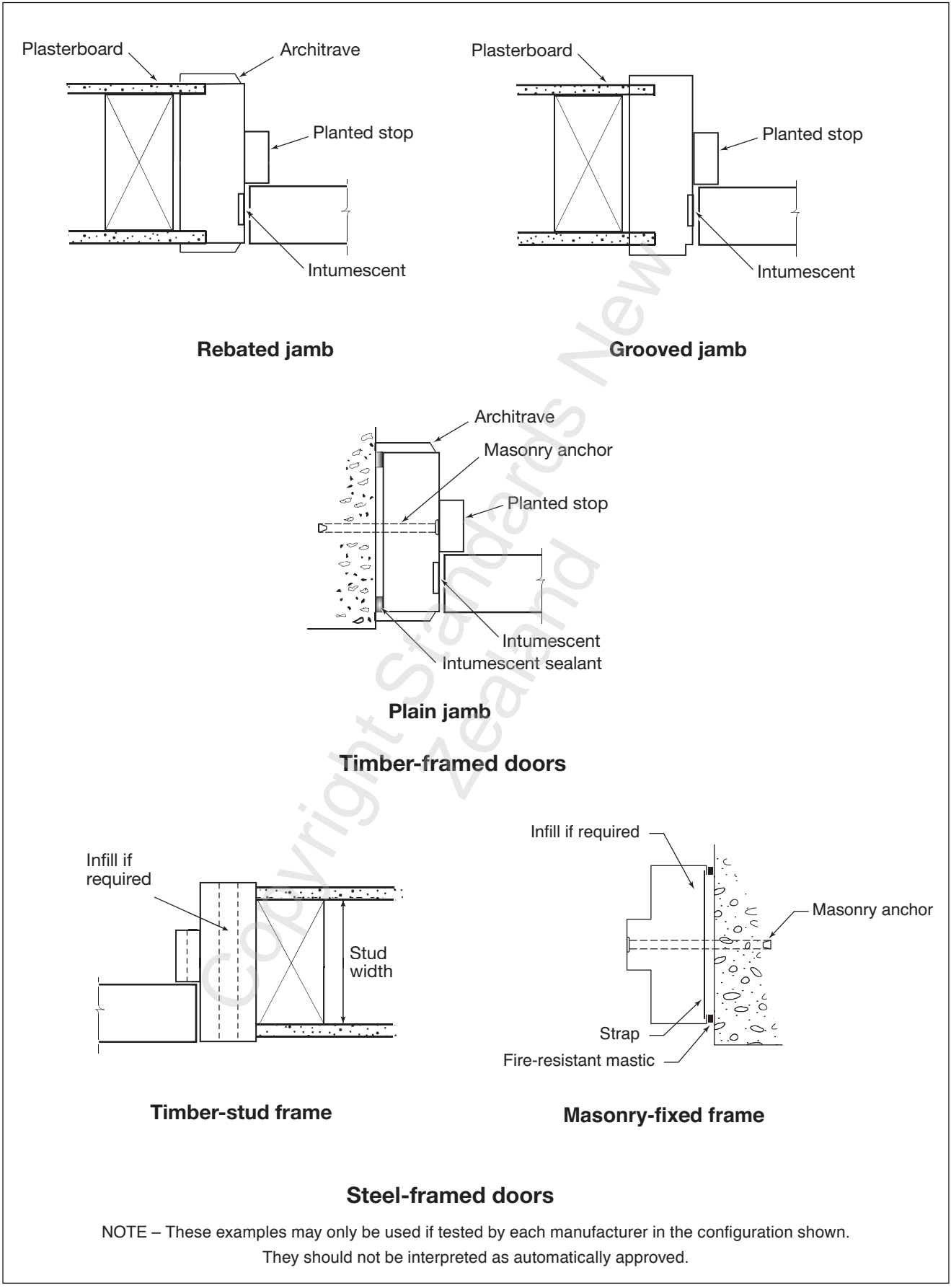


Figure 4 – Examples of door frame installations

## 6 MARKING AND DOCUMENTATION

### 6.1 General

The marking of fire-resistant doorsets shall be in accordance with the requirements of this section.

#### 6.1.1 Completed installation

The manufacturer shall supply an installer's declaration form with the doorset to be completed and signed by the installer and returned to the manufacturer.

This declaration shall include:

- (a) A list of hardware and accessories fitted to the doorset. If there is any doubt about the compliance of any item the doorset manufacturer should be consulted prior to the item being fitted;
- (b) The wall type, specification, and brand where applicable;
- (c) A statement that the doorset has been installed in accordance with the manufacturer's instructions;
- (d) A statement that the installation clearances comply with NZS 4520;
- (e) A statement that all opening and closing forces have been checked and are within the requirements of NZS 4520 under representative conditions;
- (f) A statement that hinges or pivots are correctly aligned;
- (g) A statement that the doorset latches satisfactorily from the fully open position and from any intermediate position, and the closer, if any, demonstrates satisfactory action as specified in 2.2.2 under representative conditions;
- (h) A statement that seals (if required) are correctly aligned and operating; and
- (i) A statement that a doorstop has been fitted in the correct position to each leaf to minimise the risk of damage to the leaf, frame, and hinges.

When the signed installer's declaration form has been returned to the manufacturer the manufacturer shall supply the labels to the installer who shall attach them in the locations specified in 6.2.2.

### 6.2 Identification and labelling

The fire-resistant doorset labels shall be non-combustible. If, for any reason, the doorset does not comply with this Standard the reference to NZS 4520 on the label shall be crossed out. The installer shall provide the manufacturer with supporting documents on the reason for non-compliance when returning the declaration.

#### 6.2.1 Type of label

The labels shall be permanently fixed to minimise the possibility of detachment during the service life of the fire-resistant doorset.

NOTE – Permanent fixing could be achieved by screws, rivets, or adhesives.

### 6.2.2 Position of labels

The position of the label shall be as follows:

- (a) For side-hung fire-resistant doorsets sufficient labelling shall be fixed to the edge of the hinge stile of the door leaf and to the door frame at approximately 1.5 m above floor level;
- (b) For two-leaf fire-resistant doorsets each leaf of the door shall be labelled;
- (c) Where the installation of a label on the edge of the fire-resistant doorsets is likely to compromise the performance of the door, the label shall be relocated to the face of the door leaf at its top-hinged corner; and
- (d) Location – The location of the labels shall be as follows:
  - (i) Horizontally-sliding doorsets – For horizontally-sliding doorsets, the labels shall be fixed to the trailing edge of the door leaf at approximately 1.5 m above floor level and to the door frame, if any, at approximately the same height
  - (ii) Side-hung doorsets – For side-hung doorsets the labels shall be fixed to the edge of the hinge stile of the door leaf and to the door frame at approximately 1.5 m above floor level
  - (iii) Two-leafed doorsets – Each leaf of a two-leafed doorset shall be labelled
  - (iv) Label installation – Where the installation of a label on the edge of the door is likely to compromise the performance of the door, the label shall be relocated to the face of the door leaf at its top hinged corner.

### 6.2.3 Labels

The following provisions shall apply to labels:

- (a) Method of marking – The required information shall be etched, embossed, or stamped on the labels so that it is recessed or projected not less than 0.25 mm below or above the surface of the label. Alphabetic or numeric characters shall be not less than 1.5 mm high;
- (b) Method of fixing – The labels shall be permanently fixed to minimise the possibility of detachment during the service life of the doorset.

## 6.3 Information requirements

The following information shall be shown on the labels:

- (a) Number of this Standard;
- (b) Name of the manufacturer;
- (c) Identification number of the individual doorset as recorded in the manufacturer's register;
- (d) Fire-resistance rating of the doorset in minutes; and
- (e) Date of manufacture.

Figure 5 shows an example of the information required.





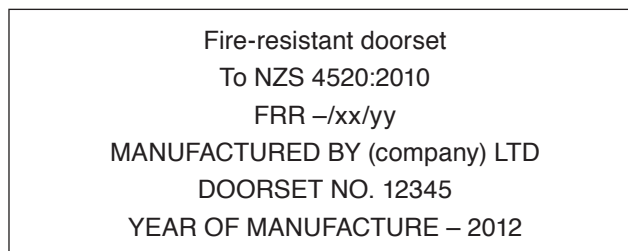


Figure 5 – Example of label information

#### 6.3.1 Additional marking for fire-resistant doorsets

Fire-resistant doorsets that are approved for exposure to fire from one side only, shall be marked indicating the face that was facing the furnace in the fire-resistance test of the tested specimen.

### 6.4 Evidence of compliance

#### 6.4.1 Attachment

The attachment of labels to the doorset shall be evidence of compliance with NZS 4520 except where the reference to this Standard on the label has been crossed out (see 6.2).

#### 6.4.2 Further evidence to be provided

When the installation of a fire-resistant doorset in a building has been completed, the manufacturer shall, upon request, provide to the building owner, or the building owner's representative, written confirmation that:

- (a) Each fire-resistant doorset is identical with the tested specimen, or, where there are variations from the tested specimen, the variations are in accordance with NZS 4520; and
- (b) The fire-resistant doorset has been installed in accordance with NZS 4520.

#### 6.4.3 Register

The manufacturer shall maintain a register of doorsets which shall be kept at the place of manufacture and supplied to the building owner or their agent to be kept at the building where the doorsets are installed. Where a compliance schedule is required, the register shall be kept with the compliance schedule. The register shall be made available for inspection to any person having reasonable cause for such inspection, listing the following information:

- (a) Building identification;
- (b) Fire-resistance rating of doorset;
- (c) Installing company's name and address;
- (d) Date the door was despatched;
- (e) Date the declaration was received;
- (f) Details of hardware fitted; and
- (g) Door clearances.



## **6.5 Doorset signs**

### **6.5.1 Installation**

Every doorset shall have a sign fixed to both sides of the door leaf, stating 'FIRE DOOR, PLEASE KEEP CLOSED', except that door leaves fitted with hold-open devices shall have signs stating only 'FIRE DOOR, KEEP CLEAR'.

### **6.5.2 Size and colour**

The size and colour of the sign shall be in accordance with the NZBC, clause F8.

Copyright Standards New  
Zealand

## 7 INSPECTION, MAINTENANCE, AND REPORTING

### 7.1 General

The following inspection, maintenance, and reporting procedures shall be carried out and recorded in accordance with 7.6, at the intervals specified, by the nominated person. The owner may undertake procedures where noted as permitted, only if they can demonstrate competence to the independently qualified person (IQP).

Opening, closing, and latching force limits for fire-resistant doorsets shall be maintained throughout the service life of the door unless a service limit is explicitly specified.

### 7.2 Weekly

The following procedures shall be carried out at weekly intervals by the IQP, the owner, or the owner's representative:

- (a) Visually check the doorset for damage to the fabric of the door, self-closing device, or other furniture;
- (b) Ensure the door closes on to the stop (if not a double swing door) and the latch operates and if a double doorset, the sequencer operates correctly; and
- (c) Ensure the door is not held open by any mechanism or object that will prevent the door from closing or functioning in the event of fire (for example wedges, cabin hooks).

### 7.3 Monthly

The following procedures shall be carried out at monthly intervals by the IQP or the owner:

- (a) As for 7.2; and
- (b) Check that labels are in place and not damaged.

### 7.4 Six-monthly

The following procedures shall be carried out at 6-monthly intervals by the IQP:

- (a) As for 7.2 and 7.3;
- (b) Check and adjust the self-closing device to ensure correct operation; and
- (c) Check the records of owner testing.

### 7.5 Annually

The following procedures shall be carried out annually by the IQP:

- (a) As for 7.2, 7.3, and 7.4;
- (b) Ensure clearances of the fire doors are maintained in accordance with the tested specimen. These clearances are in relation to the bottom of the door leaf and floor; the gap between the door leaf and jamb. See 5.3 for specific clearance requirements and Appendix C for clearance guidance information; and

- (c) Provide a 'Certificate of Compliance', (Form 12A in the Building (Forms) Regulations) for fire separations where all the maintenance described in this section has been completed in accordance with section 110 of the Building Act.

Appendix C provides further informative guidance on the annual inspection of fire-resistant doorsets for an IQP.

## 7.6 Records

A written copy of all tests and maintenance shall be made in a form approved by the building consent authority (BCA). A copy of the record shall be retained at a suitable location on the site.

Where test results are recorded electronically a hard copy shall be provided and retained on site. If a hard copy cannot be provided at the time of testing, a copy shall be returned to the site at the time of the next routine testing visit, if not before.

A full report on each annual inspection shall be sent to the owner, or the building owner's representative.

## APPENDIX A – PHYSICAL TESTING OF FIRE-RESISTANT DOORSETS

(Informative)

### A1 SCOPE

This Appendix sets out physical test methods which may, at the request of the applicant, be applied to the tested specimens of side-hung or pivot-swung, single or double-acting doorsets where it is intended to install them in high-traffic areas. The applicant may specify that these tests are carried out either before the fire-resistance test, or independent of it.

### A2 PRINCIPLE

The test specimen is mounted in a rigid frame and subjected to a series of tests to confirm its physical capacity.

### A3 APPARATUS

The apparatus consists of a suitable test rig in which the loading conditions and open/close cycles specified in this Appendix can be simulated.

### A4 SPECIMEN

The specimen should be a full-size tested specimen not less than 2040 mm × 815 mm. No alterations should be made to the doorset except for the following:

- (a) For the resistance-to-slamming test, a blank strike plate should be fitted to prevent engagement of the latch bolt; and
- (b) Replacement of damaged hardware may be effected.

### A5 TEST METHODS

#### A5.1 General

The doorset should be subjected to the tests set out in A5.2 to A5.7 in the order given. If failure is encountered in any one of the tests, the procedure should be aborted.

NOTE – The test procedure is based on the Method of Assessment and Test (MOAT) Number 7 for Internal and External Doorsets issued by the British Board of Agrément.

#### A5.2 Resistance to buckling (torsion)

##### A5.2.1 Procedure

The procedure is as follows:

- (a) Open the door to its 90° position and clamp it at the upper lock stile corner;
- (b) Progressively apply a horizontal force of up to 400 N at the handle in the direction of closing, and maintain for 2 min. Then release the force; and
- (c) After the force has been released, measure the residual horizontal deflection at the bottom lock stile corner.

**A5.2.2 Results**

The deflection measured in A5.2.1(c) should not exceed 1 mm up to 1 h after release of the force.

**A5.3 Vertical loading test****A5.3.1 Procedure**

The procedure is as follows:

- (a) With the door still in the 90° open position, apply a vertical force of 500 N to the handle through the centre line of the spindle;
- (b) Maintain the application of the force for 2 min, and then release the force; and
- (c) After the force has been released, measure the residual vertical deflection at the bottom lock stile corner.

**A5.3.2 Results**

The deflection measured in A5.3.1(c) should not exceed 1 mm up to 1 h after release of the force.

**A5.4 Resistance to slamming****A5.4.1 Procedure**

The procedure is as follows:

- (a) Fit a door closer or similar device and adjust it to close the door from the 90° open position in not more than 2 s, with no damping effect;
- (b) Using a motor device, perform 10 000 non-latching slam cycles; and
- (c) Examine the door leaf and note any damage.

**A5.4.2 Results**

The test results should be as follows:

- (a) At the end of the test there should be no cracking or delamination of the door leaf body or edge strips exceeding 0.5 mm in width and 50 mm in length; and
- (b) Where a viewing panel is fitted there should be no detachment of the system components.

**A5.5 Shock impact****A5.5.1 Procedure**

The procedure is as follows:

- (a) Vertically swing a metal or concrete sphere not exceeding 180 mm diameter and not less than 5 kg in mass to impact the bottom lock stile corner with 40 J of energy (approximately 800 mm drop) in the direction of closure against the doorstop, and repeat four more times;
- (b) Repeat (a) in the direction of opening against the normal lockset restraint; and
- (c) Examine the door leaf and note any damage.

#### **A5.5.2 Results**

At the end of the test there should be no cracking or delamination of the door-leaf body or edge strips exceeding 0.5 mm in width and 50 mm in length.

### **A5.6 Body impact**

#### **A5.6.1 Procedure**

The procedure is as follows:

- (a) Vertically swing a soft body of mass 30 kg and approximate dimensions 250 mm diameter and 600 mm length, filled with dry sand to impact the door leaf laterally adjacent to the handle in the direction of opening against the normal lockset restraint, with 60 J of energy (200 mm drop);
- (b) Repeat two more times;
- (c) Repeat (a) with 120 J of energy (400 mm vertical drop); and
- (d) Examine the door leaf and note any damage.

#### **A5.6.2 Results**

The test results should be as follows:

- (a) At the end of the test there should be no cracking or delamination of the door leaf body or edge strips exceeding 0.5 mm in width and 50 mm in length; and
- (b) There should be no breach or failure of the door lock or leaf.

### **A5.7 Resistance to misuse**

#### **A5.7.1 Procedure**

The procedure is as follows:

- (a) Place a wooden block of minimum density 500 kg/m<sup>3</sup> and approximate dimensions 40 mm × 8 mm × 50 mm at the heel of the door immediately below the bottom hinge in such a manner as to jam the door open by approximately 20°; and
- (b) Gradually apply sufficient force at the handle to close the door against the frame.

Examine the door and note any damage sustained, particularly around the hinge area.

#### **A5.7.2 Results**

The test results should be as follows:

- (a) At the end of the test there should be no cracking or delamination of the door leaf body or edge strips exceeding 0.5 mm in width and 50 mm in length; and
- (b) The screws should remain firmly anchored in the hinge plate.

NOTE – Bending of the hinge is expected and does not constitute failure.

## A6 TEST REPORT

The test report for the functional tests should include the following information:

- (a) Date and location of the test;
- (b) Result of the various tests specified in the relevant clauses of this Appendix;
- (c) Full documentation of hardware that had to be replaced;
- (d) All information that identifies the doorset and its manufacturer, as indicated in AS 1530.4; and
- (e) Reference to NZS 4520.

Copyright Standards New  
Zealand

## APPENDIX B – SENSING DEVICES

(Informative)

### B1 GENERAL

A fire-resistant doorset is required to be self-closing or automatic. Automatic doorsets should revert to self-closing on operation of a sensing device installed in accordance with NZS 4512, or on loss of power to an electromagnetic hold-open device.

### B2 SENSING DEVICE

The sensing device should be of a type suitable for that particular application and should comply with the appropriate Standards listed in table B1.

Table B1 – Sensing device requirements

Sensing device	Compliance requirements
Thermally released	AS 1890 – air-oven test for temperature rating $\leq 80^{\circ}\text{C}$
Thermal detectors	NZS 4512, as applicable
Smoke detectors	NZS 4512, as applicable
NOTE –	
(1) Refer to NZS 4512, as applicable, for guidance on the selection of detectors for particular applications.	
(2) Refer to the NZBC for specific requirements concerning activation by a sprinkler system.	

### B3 INSTALLATION OF DOORSETS AND HARDWARE

Any prescribed sensing device which operates to cause the closure of automatic doorsets should be positioned within the stream of air that passes through the door opening when the fire-resistant doorset is fully open.



## APPENDIX C – ANNUAL INSPECTION OF FIRE-RESISTANT DOORSETS FOR INDEPENDENTLY QUALIFIED PERSON

(Informative)

### C1 GENERAL

#### C1.1

Fire-resistant doorsets require regular inspections to ensure they prohibit the spread of fire and smoke and, where applicable, the occupants are not prevented from leaving the building in the event of an emergency.

#### C1.2

The manufacturer's installation manual and installation details of the fire-resistant doorset should be made available at time of the inspection.

#### C1.3

The fire-resistant doorsets should be checked that they are the same as the tested specimens, except as permitted by 3.2, 3.3, 4.3, and AS 1530.4.

### C2 NORMAL OPERATION REQUIREMENTS

#### C2.1 Fixing of door frames

The door frame should be maintained to be fixed as in the tested specimen (except as permitted in 4.3).

NOTE – This information should be in the suppliers' or manufacturers' instructions and installation manual.

#### C2.2 Clearances

##### C2.2.1 General

The clearance dimensions required for fire-resistant doorsets should be in accordance with this clause unless greater clearance dimensions have been demonstrated on a tested specimen (refer to the installation manual).

There should be a register kept on site which states clearances of the tested specimen (as required by 6.4.3).

NOTE – The clearances in C2.2 are from AS 1905.1 and are for IQP guidance only. Requirements for clearances can be found in 5.3.

##### C2.2.2 Sill and floor finish

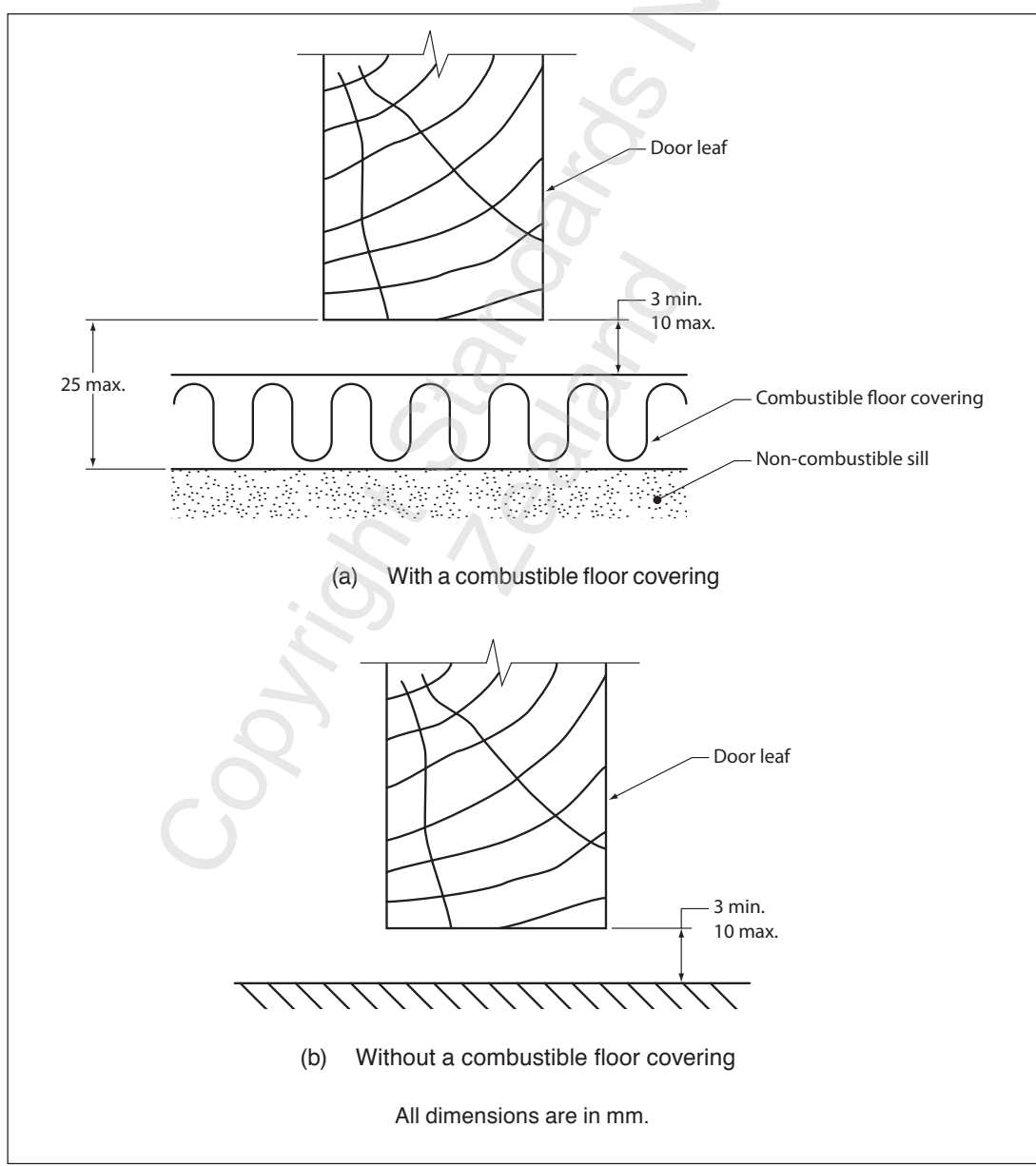
Clearances between the bottoms of all door leaves and the floor should be as follows (see figure C1):

- (a) Between the leaf and the top of any floor covering – not less than 3 mm and not more than 10 mm; and
- (b) Between the leaf and the top of the floor covering:
  - (i) Not more than 10 mm where there is no combustible floor covering
  - (ii) Not more than 25 mm where there is a combustible floor covering present.

NOTE – When the installed doorset is inspected for compliance with C2.2.2(b)(ii), the clearance should not exceed 25 mm for the purpose of certification unless an appropriate note is made in the evidence of compliance.

**CC2.2.2**

*In essence the maximum gap between the bottom of the door leaf and the adjacent floor covering is 10 mm. The 25 mm dimension is provided to limit the thickness of carpets and underlays to a maximum thickness of 15 mm in total. The intention of this Standard is to not allow a 25 mm gap under a door unless carpet is in the process of being installed. This is a temporary measure allowing for certification of the doorset, provided that a note is put in the evidence of compliance schedule and is checked at the first maintenance inspection.*



**Figure C1 – Clearances to floor**

**C2.2.3 Side-hung door, leaf to frame**

Door leaves side-hung into rebated frames should be clear of the door frame and should have mean clearances, in the closed position, between the leaf and the head, and between the leaf and each stile, of not more than 3 mm.

**C2.2.4 Double-acting doorsets**

Clearances between the edges of the door leaf and the wall, floor, head, and frame should be not greater than that necessary for the operation of the doorset and in no case should these clearances exceed those of the satisfactorily tested specimen.

**C2.2.5 Sliding doorsets**

When closed, the door leaf of sliding doorsets should:

- (a) Overlap the clear opening by not less than 75 mm at each jamb and at the door head;
- (b) Have an average clearance between the face of the door leaf and the return of the frame or wall face within the area of required overlap at the top and sides (see (a)) of not more than 10 mm;
- (c) Have a maximum clearance at any point of 15 mm; and
- (d) Have a clearance between the bottom of the door leaf and the floor as defined in 4.4.2.

NOTE – Where interlocking-steel sections are fitted to the edges of the leaf, the clearances where these edges are fitted are limited by the fire-resistance test.

**C2.3 Hardware****C2.3.1 Attachment**

All hardware that is essential for suspension, closing, and latching should be fixed to the doorset to the same requirements as per the tested specimen.

**C2.3.2 Latch handles**

Where knobs are used to operate the latch bolt, the clearance between the surface of the knob and the face of the doorstop should be maintained at not less than 35 mm.

NOTE –

- (1) It is recommended that the latch handle is located between 900 mm and 1100 mm above the finished floor.
- (2) Reference should be made to AS 1428.1 for the location requirements applicable to particular types of door hardware and to the NZBC for sanctions applicable to particular types of buildings.

**C2.3.3 Travel-limiting devices**

Every side-hung or double-acting fire-resistant doorset should be protected by means of buffers, stops, or other travel-limiting devices, to prevent damage in any installation where the fire-resistant doorset or its accessories could be subjected to forceful or careless operation.

NOTE – In this context a door closer is not considered to be a travel-limiting device.

#### **C2.3.4 Counterweighting system for sliding doors**

##### **C2.3.4.1 Protection**

Where a counterweighting system is used to provide automatic closure of sliding fire-resistant doorsets in a fire, this system should be protected to ensure free operation by means of adequate guards or enclosures. The counterweights should be not less than 150 mm clear of the floor in the door-closed position.

##### **C2.3.4.2 Adjustment**

The counterweighting systems should be as follows:

- (a) Where it is necessary to pass through the fire-resistant doorset to reach the required exit, the force required to achieve the following should not exceed 110 N:
  - (i) To move the door leaf from its closed position
  - (ii) To move the door leaf from its stationary position after the release mechanism has operated
  - (iii) To operate the door leaf through its full travel;
- (b) In other cases, the force required should be as follows:
  - (i) To move the door leaf from its closed and stationary position after the release mechanism has operated not more than 180 N
  - (ii) To operate the door leaf through its full travel (that is not more than 135 N).

#### **C2.4 Final check**

The fire-resistant doorset should latch satisfactorily from the fully open position and from any intermediate position, and the closers should demonstrate satisfactory back-checking action as required by 2.2.3.

The metal label of the fire-resistant doorset should be checked that it is permanently fixed and the information on the label is legible.

### **C3 MAINTENANCE**

Maintenance of fire-resistant doorsets should be carried out to minimise deterioration of performance over the life of the assembly.

Guidance on maintenance is provided in AS 1851 and should be found in manufacturers' instructions and installation manuals and in section 7 of the Standard.

Copyright Standards New  
Zealand

---

**© 2010 STANDARDS COUNCIL**

Approved by the Standards Council on 9 November 2010 to be a New Zealand Standard pursuant to the provisions of section 10 of the Standards Act 1988.

First published: 30 November 2010

The following references relate to this Standard:

Project No. P 4520

Draft for comment No. DZ 4520

Typeset by: Standards New Zealand

Printed by: The Colour Guy

---

