BUILDING PERFORMANCE

BPS

Building Product Specifications

FIRST EDITION | EFFECTIVE 28 JULY 2025

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Te Kāwanatanga o Aotearoa
New Zealand Government

Preface

Document status

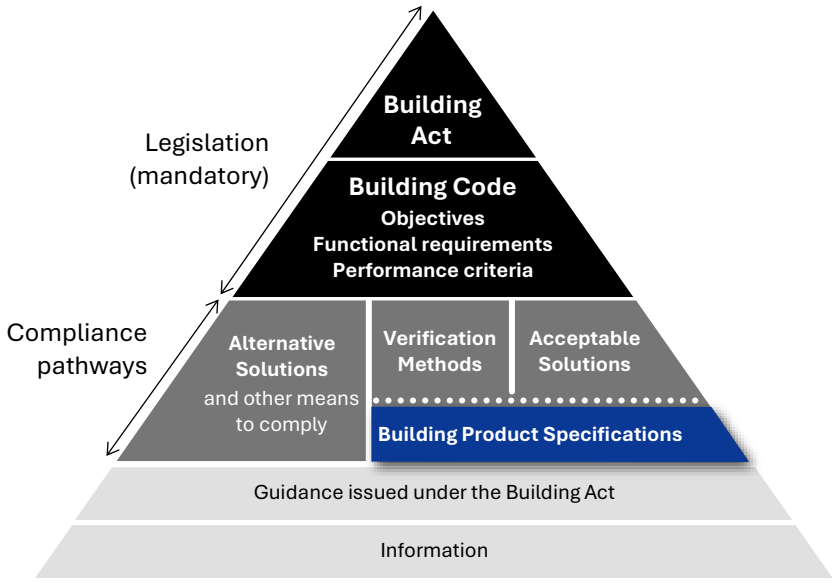
This document (the Building Product Specifications) is issued under section 25B(1) of the Building Act 2004 and is effective on 28 July 2025.

Building Code regulatory system

Using products that comply with the Building Product Specifications can support demonstrating compliance with one or more parts of the Building Code through the use of acceptable solutions and verification methods.

Other options for establishing compliance are listed in section 19 of the Building Act.

Schematic of the Building Code System



Acceptable solutions and verification methods issued by MBIE are deemed to comply with the performance criteria in the Building Code. They may include other cited design standards and information.

The Building Product Specifications may be referred to in acceptable solutions and verification methods to form part of a deemed to comply solution.

A building design must take into account all parts of the Building Code. The Building Code is located in Schedule 1 of the Building Regulations 1992 and available online at www.legislation.govt.nz.

Building Product Specifications relates to all parts of the Building Code. Information on the scope of this document is provided in Part 1. General.

Further information about the Building Code, the objectives, functional requirements and performance criteria provisions that it contains, and other acceptable solutions and verification methods are available at www.building.govt.nz.

Main changes in this version

This is the first version of the Building Product Specifications. It contains specifications and standards related to the following building products:

- Engineered fill used in site works
- Concrete, including reinforcement
- Steel
- Timber
- Cladding
- Windows, external doors and glazing
- Insulation
- Gypsum plasterboard (when used as a bracing element in wall linings)
- Heating, ventilation and air conditioning (HVAC) systems

It also contains requirements for fire characteristics of building products and materials.

Some sections contain no specifications in this version but are reserved for future use.

People using this document should check for amendments on a regular basis. The Ministry of Business, Innovation and Employment may amend any part of the Building Product Specifications at any time. Up-to-date versions of Building Product Specifications, acceptable solutions and verification methods are available from www.building.govt.nz.

Features of this document

- The standards and documents referenced in this Building Product Specifications must be the editions, along with their specific amendments listed in Appendix A.
- Hyperlinks to the full names of individual standards and documents are provided with a dotted blue underline.
- Hyperlinks to cross-references within this document and to external websites appear with a solid blue underline.
- Definitions are not provided in this document. Defined terms are provided in the acceptable solutions and verification methods that refer to the specifications in this document.
- Appendices to this document are part of, and have equal status to, the rest of the document. Figures are informative only and the wording of the paragraphs takes precedence. Text boxes headed 'COMMENT' occur throughout this document and are for guidance purposes only.
- A consistent number system has been used throughout this document. The first number indicates the Part of the document, the second indicates the Section in the Part, the third is the Subsection, and the fourth is the Paragraph. This structure is illustrated as follows:

2	Part
2.5	Section
2.5.3	Subsection
2.5.3.1	Paragraph
2.5.3.1(a)	Paragraph (as a portion of the relevant paragraph)
2.5.3.1(a)(i)	Paragraph (as a portion of the relevant paragraph)

Contents

Part 1. General

1.1 Introduction

1.1.1 Scope of this document

1.1.1.1 This document includes specifications for building products that can be used with an acceptable solution or verification method to achieve compliance with the Building Code. This includes specifications for building products in relation to their manufacture, fabrication, testing, quality control, physical properties, performance, installation, and/or maintenance.

1.1.1.2 Any geographical scope requirements for overseas product standards must be demonstrated to be within the scope of requirements appropriate for the location of the building.

1.1.2 Items outside the scope of the document

1.1.2.1 This document does not include information relating to design or construction methods, when or how building products should be used to demonstrate compliance with the Building Code, or the scope and limitations of the use of the building products.

1.1.3 Compliance pathway

1.1.3.1 This document cannot be used in isolation to demonstrate compliance with any requirements of the Building Code. An acceptable solution or verification method may reference the Building Product Specifications. When this occurs, the specifications in this document contribute to compliance with the Building Code as part of the acceptable solution or verification method.

1.1.3.2 Building products conforming to the Building Product Specifications must be used with the scope, limitations, and other applicable requirements set out in the acceptable solution or verification method.

1.2 Using the Building Product Specifications

1.2.1 Overview of this document

1.2.1.1 This document is organised by the types of products used in a building. This edition includes specifications for:

a) the site in Part 2. Site; and

b) structural elements including concrete, steel, and timber elements in Part 3. Structure; and

c) cladding, windows, doors, and insulation in Part 4. Enclosure; and

d) internal wall and ceiling linings in Part 5. Interior; and

e) internal finishes in Part 6. Finishes; and

f) buildings services in Part 7. Services.

1.2.1.2 Requirements for fire characteristics of building products and materials are presented together Part 8. Fire characteristics of building products.

1.2.1.3 This document is not a comprehensive set of requirements for building products. Additional requirements may be included in acceptable solution or verification method documents for particular Building Code clauses. There may also be additional requirements for building products in other regulatory systems, including, but not limited to, regulations made under the Health and Safety at Work Act 2015, the Gas Act 1992 and the Electricity Act 1992.

1.2.2 Citation of standards

1.2.2.1 This document contains modifications of cited standards in order to achieve compliance with the Building Code. The modifications are given for the relevant provisions in each standard.

1.2.2.2 Reconfirmed standards (designated by ‘Rxxxx’) have been reviewed and determined to meet the intended purpose of the original versions. Where these have been cited, it indicates the continued relevance of the documents.

Part 2. Site

2.1 Siteworks

2.1.1 Engineered fill

2.1.1.1 This specification includes methods for minimum compaction acceptance testing for engineered fill to be used in siteworks.

2.1.1.2 Minimum compaction acceptance testing for source materials defined in NZS 4431:2022 Appendix A shall use one or more of the methods and corresponding standards specified in Table 2.1.1.2.

Table 2.1.1.2: Minimum compaction acceptance test methods for engineered fill for source materials

Paragraph 2.1.1.2

Source material defined in NZS 4431:2022 Appendix A	Test method	Test method standard
F-A I-A C-A R-GAP 100-A R-GAP 65-A M-GAP 40-A	Plate Load Test	DIN 18134:2012-04
C-A R-GAP 100-A R-GAP 65-A M-GAP 40-A	Impact Test	ASTM D5874-24
C-A R-GAP 100-A R-GAP 65-A M-GAP 40-A	Continuous Compaction Control Test	PD CEN/TS 17006:2016

2.1.1.3 When more than 5% of material is retained on a 19 mm (¾ inch) sieve, one of the following oversize correction methods shall be used to ensure that relative compaction values are calculated accurately:

a) AASHTO T 224:2010; or

b) AS 1289.5.4.3:2006; or

c) ASTM D4718/D4718M-15(2023).

2.1.2 Timber piles and poles

2.1.2.1 This specification applies to timber piles and poles used in timber frame construction, including foundations and retaining walls.

2.1.2.2 All timber piles shall conform to one of the following standards:

a) NZS 3605:2001 subject to the following modification:

i) in clause 4.1.4.2, after “limitations for” add the word “verified”; or

b) AS 3818.3:2010 in accordance with Paragraph 2.1.2.3.

2.1.2.3 Timber piles conforming with AS 3818.3:2010 shall meet the following requirements:

a) square piles shall have a minimum dimension of 125 mm and a minimum bending moment capacity of 4.8 kNm; and

b) round piles shall have a minimum diameter of 140 mm; and

c) where timber piles are used as anchor piles, cantilever piles or braced piles, as defined in NZS 3604:2011:

i) anchor piles shall be clearly and uniquely identified and comply with clause 4.3.1 of NZS 3605:2001, and

ii) cantilever piles shall have a minimum bending moment capacity of 4.7 kNm, and

iii) braced piles shall have a minimum bending moment capacity of 4.4 kNm.

2.1.2.4 All timber poles shall conform to one of the following standards:

a) NZS 3605:2001; or

b) AS 3818.10:2010 and the timber pole shall be treated for durability such that it meets the required level of treatment as required in Subsection 3.5.1.

Part 3. Structure

3.1 Concrete

3.1.1 Concrete testing

3.1.1.1 This specification applies to the testing of concrete.

3.1.1.2 The compressive strength of precast pumice concrete units used in small chimneys shall be determined using one or more of the following test methods:

a) NZS 3112.2:1986; or

b) AS 1012.1:2014; and

c) AS 1012.9:2014; and

d) one of the following:

i) AS 1012.8.1:2014 and the temperature for curing shall be 21 ± 2 °C in Section 9 Curing, or

ii) AS 1012.14:2018 and the temperature for wet and dry preconditioning shall be 21 ± 2 °C in section 6.3.2 Methodology (c) Preconditioning.

3.2 Reinforcement for concrete

3.2.1 Steel reinforcement

3.2.1.1 This specification applies to the steel reinforcement of structural building elements.

3.2.1.2 Steel reinforcement only used in small chimneys and concrete slabs supporting solid fuel burning domestic appliances shall conform to one of the following standards:

a) AS/NZS 4671:2019; or

b) ASTM A706/A706M-24.

3.2.2 Welded steel mesh

3.2.2.1 This specification applies to welded steel mesh used in structural building elements.

3.2.2.2 Welded steel mesh only used in slab on-ground floors as part of residential construction shall conform to one of the following standards:

a) AS/NZS 4671:2019; or

b) ASTM A706/A706M-24 where bars are be substituted for mesh subject to the following requirements:

i) minimum yield strength of 550 MPa, and

ii) minimum equivalent mesh weight of 2.27 kg/m^2.

3.3 Masonry (reserved for future use)

3.4 Steel

3.4.1 Protective coatings

3.4.1.1 This specification applies to protective coatings for steel components used in small chimneys.

3.4.1.2 Hot-dip metallic coatings shall conform to one of the following standards:

a) AS 1397:2011; or

b) AS 1397:2021; or

c) ISO 9364:2017; or

d) ISO 4998:2023; or

e) ISO 3575:2016; or

f) ISO 3575:2025.

3.4.1.3 Hot dipped galvanized coatings shall conform to one of the following standards:

a) AS/NZS 4680:2006; or

b) ISO 1461:2022.

3.4.2 Cold-formed hollow, hot-rolled and welded I sections, flat and plate products

3.4.2.1 This specification is for steel sections and flat and plate products used in steel-framed structures. Structural steel shall conform to one of the following standards:

a) for any section type:

i) relevant standards in clause 2.2.1 of NZS 3404.1:1997; or

b) for cold-formed hollow sections:

i) AS/NZS 1163:2016, or

ii) BS EN 10219-1:2006, or

iii) BS EN 10219-2:2019, or

iv) BS EN 10219-3:2020; or

c) for hot-rolled sections:

i) AS/NZS 3679.1:2016; or

d) for welded I sections:

i) AS/NZS 3679.2:2016; or

e) for flat and plate products:

i) AS/NZS 1594:2002, or

ii) AS/NZS 3678:2016.

3.4.3 Fasteners – steel bolts, nuts and washers

3.4.3.1 This specification is for steel bolts, nuts and washers used in steel-framed structures.

3.4.3.2 Steel bolts, nuts and washers shall conform to one of the following standards:

a) relevant standards in clause 2.3.1 of NZS 3404.1:1997; or

b) for hexagon bolt and nut assemblies, BS EN 14399-3:2015; or

c) for plain washers, BS EN 14399-5:2015.

3.5 Timber

3.5.1 Durability – 50 years

3.5.1.1 This specification is for the treatment of timber building elements for durability purposes where the durability requirement is not less than 50 years, including methods for determining the level of treatment required.

3.5.1.2 This specification may also be used where durability requirements are less than 50 years.

3.5.1.3 The level of treatment for timber building elements where the durability requirement is not less than 50 years shall be determined in accordance with:

a) Part 1 of NZS 3602:2003, subject to the following modifications:

i) level of treatment references to radiata pine and Douglas fir solid timber in Table 1 categories ‘C’, ‘D’ and ‘E’ and Table 2 category ‘B’ shall be replaced by Table 1C, Table 1D, Table 1E and Table 2B, and

ii) references to radiata pine and Douglas fir in Table 1 categories ‘A’ and ‘B’, Table 2 category ‘A’ and Table 3 are unaltered. References to other engineered wood products and timber species in Table 1, 2 and 3 are also unaltered, and

iii) laminated veneer lumber (LVL) treated using light organic solvent preservative (LOSP) borne azoles that meets the minimum preservative retention requirements specified for H3.1 in Table 6.2 of NZS 3640:2003 satisfies the minimum treatment requirements for H1.2, and

iv) in section 109.2 (a) (iii), replace the text with: “Members supporting enclosed cantilevered decks having increased risk of failure due to there being single points of support;”, and

v) in section 109.2 (b), remove reference to Figure 1, and

vi) remove section 109 (c) (vi), and

vii) In section 109 (c) (vii), remove “that are not clad in masonry veneer described in 110.2(b)”, and

viii) remove Figure 1, Figure 2 and Figure 3, and

ix) remove section 110.2 (b), and

x) In section 110.2 (c), remove “excluding those supporting decks and balconies”, and

xi) In section 110.3.1, replace the second sentence with: “Where maintenance of an impervious coating cannot be assured in wet areas, plywood flooring treated to minimum of H3 or solid pinus species or Douglas fir flooring treated to minimum of H1.2 shall be used.”

COMMENT: This diagram illustrates the durability requirements when radiata pine or Douglas fir is used in framing.

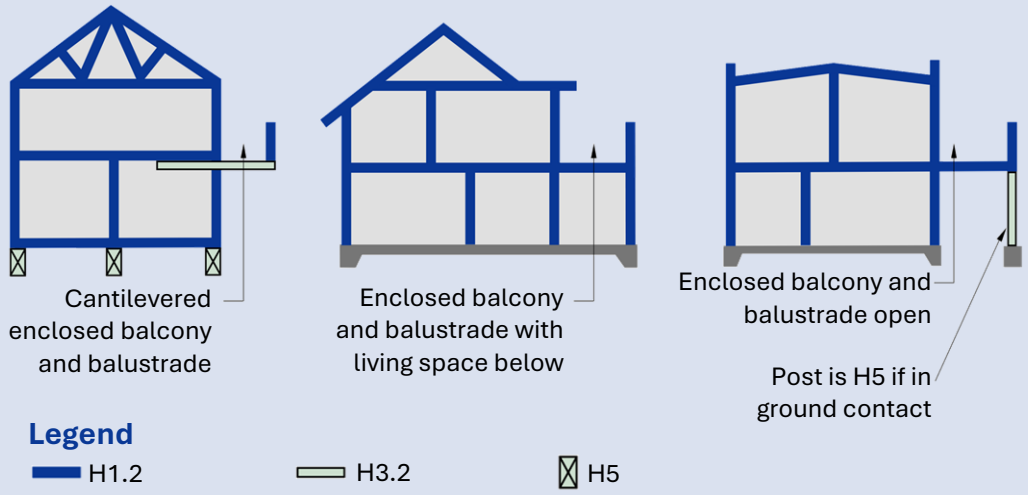


Table 1C: Requirements for radiata pine and Douglas fir solid timber to achieve a (minimum) 50 year durability performance: C – Members protected from the weather but exposed to ground atmosphere (see section 108 of NZS 3602)

Paragraph 3.5.1.3

Reference Number	Wood-based building components	Species or type	Level of treatment to NZS 3640
1C.1	Jackstuds, subfloor braces, bearers, wall plates, floor joists to the subfloor, blocking, subfloor wall studs, wailings and battens, wall studs and nogs, diagonal boards	Radiata pine Douglas fir	H1.2
1C.3	Interior flooring, suspended ground floors	Radiata pine Douglas fir	H1.2

Table 1D: Requirements for radiata pine and Douglas fir solid timber to achieve a (minimum) 50 year durability performance: D – Members exposed to exterior weather conditions and dampness but not in ground contact (see section 109 of NZS 3602)

Paragraph 3.5.1.3

Reference Number	Wood-based building components	Species or type	Level of treatment to NZS 3640
1D.1	Sarking and roof framing not protected from solar driven moisture through absorbent cladding materials(1)	Radiata pine Douglas fir	H1.2
1D.2	Enclosed flat roof framing and associated roof members	Radiata pine Douglas fir	H1.2
1D.3	Enclosed skillion roof framing and associated roof members	Radiata pine Douglas fir	H1.2
1D.4	Valley boards and boards supporting flashings or box gutters and flashings to roof penetrations and upstands to roof decks(2)	Radiata pine Douglas fir	H1.2
1D.5	Wall framing and other members within or beneath a parapet	Radiata pine Douglas fir	H1.2
1D.6	Wall framing and other members within enclosed decks or balconies	Radiata pine Douglas fir	H1.2
1D.7	Cantilevered enclosed deck joists and associated framing including joist trimmers, nogs and blocking	Radiata pine Douglas fir	H3.2
1D.8	Wall framing and other members supporting enclosed decks (including enclosed cantilevered decks) or balconies	Radiata pine Douglas fir	H1.2
1D.10	Battens used behind cladding to form a cavity	Radiata pine Douglas fir	H3.1
1D.14	All other exterior wall framing and other members, such as exterior and boundary joists(3), lintels wall plate and double top plates, studs, together with parapets, enclosed balustrades, boxed columns and chimneys	Radiata pine Douglas fir	H1.2

Notes:

(1) Absorbent cladding materials such as timber shakes and shingles absorb moisture that can be driven into frame cavities by evaporation. Unless the cavities are adequately drained and ventilated, continuing condensation caused by solar driven transfer increases the moisture content in the cavities and timber framing requires a higher level of treatment to resist decay.

(2) Any metal flashing shall be separated from the treated timber with building paper.

(3) Exposed ends of joists shall be protected by a boundary joist.

Table 1E: Requirements for radiata pine and Douglas fir solid timber to achieve a (minimum) 50 year durability performance: E – Members not exposed to weather or ground atmosphere and in dry conditions (see section 110 of NZS 3602)
Paragraph 3.5.1.3

Reference Number	Wood-based building components	Species or type	Level of treatment to NZS 3640
1E.1	All roof trusses including gable end trusses, roof framing, ceiling and eaves framing, purlins and battens	Radiata pine Douglas fir	H1.2
1E.2	All midfloor framing including boundary joists, ceiling framing, ceiling battens and double top plates	Radiata pine Douglas fir	H1.2
1E.3	Wall framing and roof framing (including trusses) protected from the weather, in unlined and unoccupied farm buildings and outbuildings except those not allowed in 110.2(f) of NZS 3602	Radiata pine Douglas fir	None
1E.5	Internal walls	Radiata pine Douglas fir	H1.2
1E.7	Interior flooring	Pinus species Douglas fir	H1.2

Table 2B: Requirements for radiata pine and Douglas fir solid timber to achieve a (minimum) 15 year durability performance: B – Members protected from the weather and dampness (see section 111 of NZS 3602)
Paragraph 3.5.1.3

Reference Number	Wood-based building components	Species or type	Level of treatment to NZS 3640
2B.1	Non-load bearing interior wall framing	Radiata pine Douglas fir	H1.2
2B.2	Stair treads, risers and handrails	Radiata pine Douglas fir	None

3.5.1.4 The method required to achieve the level of treatment determined in Paragraph 3.5.1.3 shall be in accordance with one of the following standards:

a) for laminated veneer lumber requiring H1.2 level of treatment and round and sawn timber: NZS 3640:2003; subject to the following modifications:
   i) comment C3.1 shall be taken to be normative text, and
   ii) clause 6.3.1.1 shall be deleted and replaced with: “Complete sapwood penetration shall be achieved”; and

b) for plywood:
   i) AS/NZS 1604.3:2002, or
   ii) AS/NZS 1604.3:2012 ; and

c) for laminated veneer lumber, except when requiring H1.2 level of treatment:
   i) AS/NZS 1604.4:2002, or
   ii) AS/NZS 1604.4:2012; and

d) for glue laminated timber products:
   i) AS/NZS 1604.5:2002, or
   ii) AS/NZS 1604.5:2012.

3.5.2 Durability – 15 years

3.5.2.1 This specification is for the treatment of timber building elements for durability purposes where the durability requirement is 15 years, including methods for determining the level of treatment required.

3.5.2.2 This specification may also be used where durability requirements are less than 15 years.

3.5.2.3 The level of treatment for timber building elements where the durability requirement is 15 years shall be determined in accordance with:

a) NZS 3602:2003 subject to the modifications in Paragraph 3.5.1.3; or

b) ISO 21887:2007 or

c) AS/NZS 1604.1:2021; or

d) AWPA U1-24; or

e) BS EN 335:2013.

3.5.2.4 For the level of treatment determined using one of the standards in Paragraph 3.5.2.3, an equivalent level of treatment across these standards provided in Table 3.5.2.4 may be used.

Table 3.5.2.4: Equivalent levels of treatment of timber building elements for a durability requirement of 15 years

Paragraph 3.5.2.4

NZS 3602:2003 Reference number (Tables 2 and 3)	ISO 21887:2007 Use class (Table 1)	AS/NZS 1604.1:2021 Exposure (Table 1.5.2)	AWPA U1-24	BS EN 335:2013 Use class (Table 1)
Members protected from the weather and dampness 2B.1 2B.2 3.1 3.2 3.3	1 Interior, dry	Inside, above ground H1 H1.2 H2 H2 F H2 S	UC1 Interior/Dry	UC 1 Interior, dry
Members exposed to exterior weather conditions and dampness 2A.1 2A.2 2A.3 2A.4 2A.5 2A.6 2A.7	3.2 Exterior, above-ground unprotected from the weather	Outside, above ground H3 H3 Fencing H3 A	UC3B Above Ground, Exposed, (Comm Spec A) Exterior Construction UC3B Above Ground, Exposed, (Comm Spec Others) Exterior Construction	UC 3.2 Exterior, above Ground, exposed to the weather, prolonged wetting conditions

3.5.2.5 When the level of treatment is determined in accordance with Paragraph 3.5.2.3(a), the treatment method shall be as specified in Paragraph 3.5.1.4.

3.5.2.6 When the level of treatment is determined in accordance with Paragraphs 3.5.2.3(b), or 3.5.2.3(c), 3.5.2.3(d), or 3.5.2.3(e), the treatment method required to achieve that level of treatment shall be in accordance with the same standard.

3.5.3 Wall bracing elements

3.5.3.1 This specification is for determining the bracing rating of wall bracing elements used in timber-framed construction.

3.5.3.2 The bracing rating of wall bracing elements shall be determined using one or more of the following methods:

a) when sheet lining or cladding products as part of proprietary system are used as wall bracing, the bracing rating shall be determined in accordance with BRANZ Technical Paper P21 (2010); or

b) for gypsum plasterboard as part of a non-proprietary system, the bracing rating may be determined in accordance with Paragraph 3.5.3.3.

3.5.3.3 When gypsum plasterboard is used as wall bracing, the bracing rating shall be 50 bracing units per meter (50 BU/m) where:

a) the wall bracing element is:
   i) a length of timber framed wall not less than 1.2 metres long, and
   ii) entirely covered by gypsum plasterboard fixed to both faces; and

b) the gypsum plasterboard is:
   i) 10mm thick and not less than 7 kg/m^2 mass per unit area, or
   ii) 13 mm thick and not less than 9 kg/m^2 mass per unit area; and

c) the gypsum plasterboard is fixed to framing members at a:
   i) minimum of 12 mm from the sheet edge, and
   ii) maximum of 300 mm centres, and
   iii) maximum of 50 mm centres within 400 mm of the sheet corners; and

d) the gypsum plasterboard is fixed to framing members with either:
   i) 6g x 32 mm (minimum) screw fixings, or
   ii) 30 x 2.5 mm nail fixings; and

e) any penetrations in the gypsum plasterboard are:
   i) no greater than 90 mm x 90 mm , and
   ii) a minimum of 100 mm from the sheet edge, and
   iii) not more than two in a single sheet; and

f) the gypsum plasterboard conforms to one of the following standards and the corresponding requirements of the specified grade/type:
   i) AS/NZS 2588:2018, or
   ii) ASTM C1396/C1396M-24, or
   iii) BS EN 520:2004+A1:2009.

Part 4. Enclosure

4.1 Tanking (reserved for future use)

4.2 Wall cladding

4.2.1 Fibre-cement flat sheets

4.2.1.1 This specification applies to fibre-cement products used in the following applications: flat fibre-cement weatherboard cladding, fibre-cement sheet wall cladding, and fibre-cement sheets used as rigid backing for stucco plaster cladding, with respect to their properties for use as components of cladding systems. It does not apply to fibre-cement products used in other applications.

4.2.1.2 Fibre-cement products shall conform to one of the following standards:

a) AS/NZS 2908.2:2000 and the fibre-cement product shall:
   i) meet the requirements for Type A sheets, and
   ii) meet the frost resistance requirements of the freeze-thaw test.

b) ISO 8336:2017 and the fibre-cement product shall:
   i) meet the requirements for Category A sheets with Class 2, 3, 4, or 5 modulus of rupture, for flat fibre-cement weatherboards and fibre-cement sheets used as wall cladding, or
   ii) meet the requirements for Category B sheets with Class 2, 3, 4, or 5 modulus of rupture, for fibre-cement flat sheets used as rigid backing for stucco plaster cladding.

c) BS EN 12467:2012+A2:2018 and the fibre-cement product shall:
   i) not be boards of Portland or equivalent cement reinforced with fibrous wood particles, and
   ii) not contain asbestos, and
   iii) meet the requirements for Category A sheets with Class 2, 3, 4 or 5 modulus of rupture, for flat fibre-cement weatherboards and fibre-cement sheets used as wall cladding, or
   iv) meet the requirements for Category B sheets with Class 2, 3, 4 or 5 modulus of rupture, for fibre-cement flat sheets used as rigid backing for stucco plaster cladding.

4.2.2 Exterior insulation and finish systems

4.2.2.1 This specification applies to Exterior Insulation and Finish Systems (EIFS) cladding systems and fibreglass reinforcing mesh used in EIFS.

4.2.2.2 Fibreglass reinforcing mesh used in EIFS shall:

a) meet a minimum weight requirement of 150 grams per square meter (g/m^2); and
b) have aperture dimensions between a minimum of 3 mm x 3 mm to a maximum of 6 mm x 6 mm square; and
c) maintain its strength following alkaline conditioning in accordance with Paragraph 4.2.2.3.

4.2.2.3 Maintenance of strength following alkaline conditioning shall be verified using one of the following requirements:

a) meeting the strength requirements after tri-alkali solution exposure of ISO 17738-1:2021 section 4.1.1 in accordance with the methods set out in section 5.4.10; or
b) meeting alkaline conditioning requirements and maintaining at least 50% of its tensile strength under testing in accordance with one of the following standards:
   i) ASTM E2098M-25, or
   ii) ASTM E2098M-13, or

iii) ASTM E2098-00.

4.2.2.4 The tensile-adhesion of coatings for EIFS cladding systems shall be tested in accordance with one of the following standards:

a) ASTM E2134M-14; or

b) ASTM E2134-01.

4.3 Roofing (reserved for future use)

4.4 Windows, external doors and glazing

4.4.1 Structural and weathertightness provisions

4.4.1.1 Windows and external doors shall have a window rating suitable for the building's wind zone, as determined in accordance with Clause 5.2.1 of NZS 3604:2011 and conform to one of the following standards:

a) NZS 4211:2008 provided that:

i) where specific design is required, the parameters for serviceability deflection, water penetration and ultimate strength are suitable for the serviceability and ultimate state limit pressures, as calculated by the building design engineer, and the ultimate limit state wind pressure does not exceed 2500 Pa.

b) SNZ TS 4211:2022 provided that:

i) when the exposure rating is EM7, windows and external doors may be used in wind zones up to and including Extra High, or where the ultimate limit state wind pressure, as calculated by the building design engineer, does not exceed 2500 Pa, and

ii) when the exposure rating is SED (specific engineering design), the parameters for serviceability (deflection), water penetration resistance and ultimate strength are suitable for the serviceability and ultimate state limit pressures, as calculated by the building design engineer, and the ultimate limit state wind pressure does not exceed 2500 Pa.

c) Sections 1, 2.1.1, 2.3, 2.4, 2.5, 2.6, and 8 of AS 2047:2014 provided that:

i) the required testing is performed by an ISO/IEC 17025 accredited tested facility registered for such tests, and

ii) windows and external doors are rated for serviceability limit state wind pressure, ultimate limit state wind pressure, and water penetration resistance as specified in Table 4.4.1.2 for the *building's wind* zone.

4.4.1.2 Table 4.4.1.2 shows the minimum serviceability limit state wind pressure, ultimate limit state wind pressure, and water penetration resistance pressure levels required in each wind zone for windows and external doors tested in accordance with AS 2047:2014.

Table 4.4.1.2: Minimum pressure levels required when windows and external doors are tested in accordance with AS 2047:2014

Paragraphs 4.4.1.1 and 4.4.1.2

NZS 3604 (Clause 5.2.1) Wind zone	Serviceability limit state (SLS) for windows or sliding door	Serviceability limit state (SLS) for doors other than sliding doors	Water penetration resistance	Ultimate limit state (ULS)
Low	± 510 Pa	± 1020 Pa	± 153 Pa	± 720 Pa
Medium	± 680 Pa	± 1360 Pa	± 204 Pa	± 960 Pa
High	± 970 Pa	± 1940 Pa	± 291 Pa	± 1360 Pa
Very High	± 1250 Pa	± 2500 Pa	± 375 Pa	± 1760 Pa
Extra High	± 1515 Pa	n/a(1)	± 455 Pa	± 2130 Pa

Notes:

(1) External doors other than sliding doors that are tested in accordance with AS 2047:2014 are not suitable for use in Extra High wind zones.

4.4.1.3 Windows may be rated for air infiltration or permeability. Table 4.4.1.3 demonstrates the equivalent minimum air infiltration or permeability ratings for the standards referenced in Paragraph 4.4.1.1 to support the selection of windows.

Table 4.4.1.3: Equivalent air infiltration or permeability ratings

Paragraph 4.4.1.3

NZS 4211:2008 air infiltration rating	SNZ TS 4211:2022 air permeability class(1)	AS 2047:2014 air infiltration rating
Air conditioned	Class 3	Low
Non-air conditioned	Class 2	High

Note:

(1) Air permeability class ratings represent the equivalent minimum rating; that is, a higher air permeability class will usually also satisfy requirements.

4.4.1.4 Glazing, including glass used in windows and external doors, shall:

a) for the selection of glazing, conform with one of the following standards:
   i) NZS 4223.1:2008, or
   ii) AS 1288:2021 and the requirements for serviceability and ultimate limit state design actions set out in section 3.8.3 of NZS 4223.1:2008 are met; and

b) for insulating glass units, conform to one of the following standards:
   i) NZS 4223.2:2016, or
   ii) AS/NZS 4666:2012.

c) for glazing with human impact safety requirements, conform to NZS 4223.3:2016 subject to the following modifications:
   i) replace Clause 22.4.2 of NZS 4223.3:2016 with the following:

   "22.4.3 Structural glass barriers

   Structural glass barriers use glass as a structural element and are normally classified by the following types. Glass design for these types shall comply with the following tables (see note 1):

   Table 14 – Structural balustrade – cantilevered glass;

Table 15 – Structural balustrade – two-edge point fixed;

Table 16 – Structural balustrade – two-edge support;

Table 17 – Structural balustrade – three-edge support.

Design types and glass types not shown in Tables 14 to 17 require specific design.

All structural glass barriers safeguarding a fall of 1000 mm or more shall have interlinking rails, which in the event a glass pane breaks, span the broken pane at the required barrier height and:

(a) resist Line and Concentrated design loads (SLS) specified in Tables 14 to 17

(b) do not deflect more than 100 mm, in any direction, under the design loads.

Interlinking rails are not required for a heat-strengthened or toughened laminated safety glass barrier that has:

(a) a top capping, corner brackets or a proprietary system and will, when both panes of the laminate are fractured, resist a 0.2 kN concentrated load and not deflect more than 250 mm (see note 2), or

(b) two or three edges supported by structural sealant joints or continuous clamps, and will, when both panes of the laminate are fractured, resist a 0.2 kN concentrated load and not deflect more than 250 mm (see note 2), or

(c) a stiff interlayer and will, when both panes of the laminate are fractured, resist a 0.2 kN concentrated load and not deflect more than 250 mm (see note 2). Physical testing must be undertaken to demonstrate compliance with the load and deflection requirements for laminated glass barriers with a stiff interlayer (see note 3).

Physical testing of glass barriers must include all components of the barrier system, including all structural connections. Loads and deflections must be applied and measured horizontally, at midspan, at the required barrier height. The concentrated load shall be applied over an area of 100 mm x 100 mm and for at least one minute.

NOTE –

(1) The design of structural connections, fasteners and mounting hardware that are part of the glass barrier is outside the scope of this Standard and must be specifically designed.

(2) Laminated glass is susceptible to minor edge delamination, depending on the interlayer type and laminating process. Normally this will not affect the mechanical properties but can be noticeable on exposed edges.

(3) Test results for dual pane fracture of laminated glass barriers with stiff interlayers are not applicable to barriers that have narrower glass panes than that tested."

4.4.2 Fire characteristics

4.4.2.1 Refer to Part 8. Fire characteristics of building products for additional specifications that apply to fire doors, smoke control doors, and fire resisting glazing.

4.5 Insulation

4.5.1 Thermal resistance

4.5.1.1 This specification includes the methods for determining the thermal resistance (R-value) for insulation materials used in buildings. This applies, but is not limited to, the materials for roofs, walls, floors, and ceilings.

4.5.1.2 The thermal resistance (R-value) of insulation materials shall be determined using AS/NZS 4859.1:2018 and the thermal resistance for individual material specimens shall be determined using one or more of the methods in Paragraph 4.5.1.3.

4.5.1.3 The thermal resistance for individual material specimens shall be determined using one or more of the following standards for specific insulation types:

a) for loose fill insulation, ASTM C687-24; or

b) for vacuum panels, ASTM C1667-15; or

c) for any other insulation types excluding loose fill and vacuum panels:

i) ASTM C177-19e1, or

ii) ASTM C518-21, or

iii) ASTM C1363-24, or

iv) ISO 8301:1991, or

v) ISO 8302:1991, or

vi) ISO 8990:1994, or

vii) BS EN 12667:2001, or

viii) BS EN 12939:2001.

4.5.1.4 When the standards in Paragraph 4.5.1.3 do not provide the thermal resistance in units of m^2·K/W:

a) multiply the imperial R-value in Rft^2hr/BTU by 0.1761 to convert to m^2·K/W; or

b) divide 1 by the U-value in $W/(m^2.K)$ to convert to m^2·K/W.

4.5.2 Fire characteristics

4.5.2.1 Refer to Part 8. Fire characteristics of building products for additional specifications related to combustibility, fire resistance, and fire spread that may apply to insulation products.

Part 5. Interior

5.1 Wall and ceiling linings

5.1.1 Gypsum plasterboard bracing capacity

5.1.1.1 When gypsum plasterboard is used as wall bracing in timber framed construction, the specification in Subsection 3.5.3 shall be used to determine the bracing rating of the wall bracing element.

5.1.2 Gypsum plasterboard fire characteristics

5.1.2.1 Refer to Part 8. Fire characteristics of building products for additional specifications related to combustibility, fire resistance, and fire spread that may apply to gypsum plasterboard products.

Part 6. Finishes

6.1 Applied coatings (reserved for future use)

6.2 Tiling (reserved for future use)

Part 7. Services

7.1 Plumbing and drainage (reserved for future use)

7.2 Heating, ventilation and air conditioning (HVAC) systems

7.2.1 Pump motor efficiency

7.2.1.1 This specification includes the methods for determining the pump motor efficiency for air conditioning systems.

7.2.1.2 Pumps that form part of an air conditioning system shall conform with one of the following methods:

a) European Union Commission Regulation No 622/2012; or

b) BS EN 16297-1:2012, BS EN 16297-2:2012, and BS EN 16297-3:2012.

7.2.2 Installation and maintenance of air handling units

7.2.2.1 This specification includes the methods for installing and maintaining air handling units.

7.2.2.2 Air handling units shall be installed and maintained to AS/NZS 3666.1:2011 and AS/NZS 3666.2:2011.

7.2.2.3 Access for maintenance of air handling units for microbial control shall conform to one of the following standards:

a) AS/NZS 3666.1:2011 and AS/NZS 3666.2:2011; or

b) BS EN 13053:2019.

Part 8. Fire characteristics of building products

8.1 Properties of materials

8.1.1 Combustibility

8.1.1.1 This specification includes methods for determining whether a material is non-combustible, limited combustible, or combustible.

8.1.1.2 Non-combustible materials include those that are:

a) composed entirely of glass, concrete, steel, brick/block, ceramic tile, or aluminium; or

b) non-combustible when tested to NZS/AS 1530.1:1994; or

c) non-combustible when tested to AS 1530.1:1994; or

d) classified as A1 in accordance with BS EN 13501-1:2018; or

e) tested to ISO 1182:2020, BS EN ISO 1182:2020, or ISO 1182:2010, and achieve:

i) ΔT (rise in temperature of the furnace) of ≤ 30°C, and

ii) Δm (mass loss of the specimen) of ≤ 50%, and

iii) t_f (time of sustained flaming) of 0s.

8.1.1.3 Limited combustible materials include those that are classified as A2 in accordance with BS EN 13501-1:2018.

8.1.1.4 Combustible materials are those that do not meet any of the specifications for non-combustible or limited combustible.

8.1.2 Flammability of floor coverings

8.1.2.1 The critical radiant flux for floor coverings is to be determined by either:

a) using the generic performance ratings for flooring materials specified in Table 8.1.2.1 and:

i) concrete, wood products, plywood, or solid timber materials may include waterborne or solvent borne applied coatings not more than 0.4 mm thick and not more than 100 g/m^2; or

b) testing to ISO 9239-1:2010.

Table 8.1.2.1: Generic critical radiant flux values for some substrate and coating combinations

Paragraph 8.1.2.1

Flooring material	Critical radiant flux (CRF)
Concrete, brick, ceramic, porcelain tile	4.5 kW/m^2
Wood products, plywood, or solid timber	2.2 kW/m^2

COMMENT: Some timber species and thicknesses and with/without applied coatings may achieve a higher CRF when tested but this would require supporting test data to ISO 9239-1:2010 to demonstrate the higher CRF value.

8.1.3 Flammability of suspended flexible fabrics and membrane structures

8.1.3.1 Suspended flexible fabrics and membrane structures shall be assigned a flammability index when tested to AS 1530.2:1993.

8.2 Fire resistance

8.2.1 Fire resistance ratings

8.2.1.1 This specification includes methods for assigning a fire resistance rating (FRR) to primary elements and secondary elements, closures, and fire stops. Additional specifications for closures are provided in Subsection 8.3.

8.2.1.2 A fire resistance rating (FRR) shall be assigned when the relevant elements or products are tested in accordance with:

a) AS 1530.4:2014; or

b) AS 1530.4:2005; or

c) NZS/BS 476.21:1987; or

d) NZS/BS 476.22:1987.

8.2.1.3 Fire stops shall be tested:

a) in accordance with AS 4072.1:2005; and

b) in circumstances representative of their use in service, paying due regard to the size of expected gaps to be fire stopped, and the nature of the fire separation within which they are to be used.

8.2.2 Smoke separations

8.2.2.1 Smoke separations shall:

a) be a smoke barrier complying with BS EN 12101-1:2005+A1:2006; or

b) comply with the following:

i) consist of rigid building elements capable of resisting without collapse a pressure of 0.1 kPa applied from either side and self-weight plus the intended vertically applied live loads, and

ii) form an imperforate barrier to the spread of smoke, and

iii) be of non-combustible construction, or achieve an FRR of 10/10/-, except that non-fire resisting glazing may be used if it is toughened or laminated safety glass.

8.3 Closures including fire doors, smoke control doors, glazing, and dampers

8.3.1 Fire doors

8.3.1.1 Fire doors shall be evaluated in circumstances representative of their use in service and comply with NZS 4520:2010.

8.3.1.2 Glazing in fire doors shall be fire resisting glazing complying with Subsection 8.3.3 and must have the same integrity value as the door. If the door requires an insulation value, an uninsulated vision panel may be used without downgrading the insulation value of the door. Vision panels in fire doors shall comply with NZS 4520:2010.

8.3.1.3 Self-closing devices must be adjustable during installation of the door.

8.3.1.4 Markings and labelling shall comply with NZS 4520:2010. Doorsets shall be clearly marked to show their FRR and, if used as a smoke control door, to show their smoke stopping capability.

8.3.2 Smoke control doors

8.3.2.1 Smoke control doors shall be:

a) a fire door as specified in Subsection 8.3.1 fitted with appropriate smoke seals; or

b) a door:
   i) constructed with solid core leaves and solid timber core leaves. Solid timber core leaves shall have a leaf thickness of no less than 35 mm, and
   ii) fitted with smoke seals in continuous contact with the mating element and located so as to minimise interruption by hardware, and
   iii) with frames constructed of timber and jambs no less than 30 mm thick, and
   iv) with any vision panel cut-outs no less than 150 mm from the leaf edges, and
   v) with the maximum average clearances (excluding pre-easing) of leaf-to-frame of 3 mm, leaf-to-leaf of 5 mm, and leaf to top of any floor covering 10 mm, and
   vi) with any additional facings adhesive fixed.

8.3.2.2 Glazing in smoke control doors shall meet the requirements for smoke separations as specified in Subsection 8.2.2.

8.3.2.3 Self-closing devices must be adjustable after installation of the door.

8.3.2.4 Doorsets shall be clearly marked to show their smoke stopping capability and provided with signage identifying them as a smoke control door.

8.3.3 Fire resisting glazing

8.3.3.1 Fire resisting glazing, including the frame, fixings, mullions, transoms and glazing beads, shall comply with NZS 4232.2:1988.

8.3.4 Fire and smoke dampers

8.3.4.1 Fire dampers and smoke dampers shall comply with:

a) AS 1682.1:2015 and AS 1682.2:2015; or

b) AS 1682.1:1990 and AS 1682.2:1990.

8.4 Fire properties of external wall cladding

8.4.1 Cladding materials

8.4.1.1 This specification contains the requirements for the fire properties of wall cladding materials.

8.4.1.2 Wall cladding materials shall be identified as:

a) non-combustible, limited combustible, or combustible as per Subsection 8.1.1; or

b) classified as Type A or Type B using the values in Table 8.4.1.2 when tested in accordance with:
   i) ISO 5660-1:2015, or
   ii) ISO 5660-1:2002, or
   iii) AS/NZS 3837:1998.

8.4.1.3 When complying with Paragraph 8.4.1.2(b), in addition to meeting the general requirements of ISO 5660-1:2015, ISO 5660-1:2002, or AS/NZS 3837:1998; testing shall be in accordance with the following specific requirements:

a) an applied external heat flux of 50 kW/m^2; and

b) a test duration of 15 minutes; and

c) the total heat release measured from start of the test; and

d) sample orientation horizontal; and

e) ignition initiated by the external spark igniter.

8.4.1.4 Timber claddings that have a fire retardant treatment incorporated in or applied to them shall be subjected to the regime of accelerated weathering described in ASTM D2898:2010 Method B

with the water flow rate from Method A before testing in accordance with the requirements of Paragraph 8.4.1.2.

8.4.1.5 Claddings incorporating a metal facing with a melting point of less than 750°C covering a combustible core or insulant shall be tested as described in Paragraph 8.4.1.3 without the metal facing present.

Table 8.4.1.2: Classification of cladding materials

Paragraph 8.4.1.2

Cladding material type	Peak heat release rate (kW/m^2)	Total heat
Type A	≤ 100	≤ 25
Type B	≤ 150	≤ 50

8.4.2 Cladding systems

8.4.2.1 This specification contains the requirements for wall cladding materials tested or classified together as a system.

8.4.2.2 An external wall cladding system can be specified using one or more of the testing and classification methods and their acceptance criteria shown in Table 8.4.2.2.

Table 8.4.2.2: Testing and acceptance criteria for external wall cladding tested as a system

Paragraph 8.4.2.2

Testing or classification method	Acceptance criteria
AS 5113:2016	EW classification
BS 8414-1:2015+A1:2017	BR 135 (2013)
BS 8414-2:2015+A1:2017	BR 135 (2013)
NFPA 285:2019	Pass, and have cladding materials that are: a) non-combustible or limited combustible as specified in Subsection 8.1.1; or b) Type A as specified in Subsection 8.4.1

8.5 Fire spread on linings, coverings, and other materials

8.5.1 Group Numbers

8.5.1.1 This specification contains the methods for determining the material Group Number for linings, coverings, and other materials.

8.5.1.2 The material Group Number shall be assigned by:

a) using the generic performance ratings for surface finishes specified in Subsection 8.5.2; or

b) using the classifications determined in accordance with BS EN 13501-1:2018 as specified in Subsection 8.5.3; or

c) using the classifications determined in accordance with AS 5637.1:2015 as specified in Subsection 8.5.3; or

d) testing to ISO 9705-1:2016, ISO 9705:1993, or AS ISO 9705:2003 as specified in Subsection 8.5.4; or

e) testing sandwich panels to ISO 13784-1:2014 or ISO 13784-1:2002 as specified in Subsection 8.5.4; or

f) testing to ISO 5660-1:2015 as specified in Subsection 8.5.5; or

g) testing to ISO 5660-1:2002 and ISO 5660-2:2002 as specified in Subsection 8.5.5; or

h) using the criteria for the surfaces for ducts for HVAC systems as specified in Subsection 8.5.6; or

i) using the criteria for wall and ceiling elements that include foamed plastics as specified in Subsection 8.5.7.

8.5.1.3 For testing materials or coatings that are usually applied to a substrate,

a) the materials or coatings that are usually applied to a particular substrate must be applied to the appropriate substrate for testing; and

b) when the material may be applied to a variety of substrates, the substrate selected for testing must be one which most closely represents the end use condition; and

c) a test result for a material or coating tested on any one of the specified substrates may also be used when the material or coating is applied to any other substrate of

i) the same type, or

ii) a less reactive type and of equal or greater density based on the comparative reactivity of substrates in Table 8.5.1.3; and

Table 8.5.1.3: Selection of substrate for testing to determine Group Numbers

Paragraph 8.5.1.3

Substrate material	Substrate type
Timber, standard grade plywood, hardboard, fibre/particleboard when the substrate is less than 12 mm thick	1 (most reactive)
Timber, standard grade plywood, hardboard, fibre/particleboard when the substrate is 12 mm thick or greater	2 (more reactive)
Paper faced gypsum board products	3 (less reactive)
Concrete/masonry, fibre-reinforced cement board, non-paper faced gypsum boards	4 (least reactive)

8.5.2 Determining a material Group Number based on generic performance for some surface finishes

8.5.2.1 The material Group Number for some surface finishes can be assigned using the combinations of substrates and coatings in Table 8.5.2.1.

8.5.2.2 Materials can be assigned a material Group Number of 1 or 1–S when they are:

a) non-combustible when tested to in accordance with NZS/AS 1530.1:1994 in Paragraph 8.1.1.2(b) or AS 1530.1:1994 in Paragraph 8.1.1.2(c); or

b) tested to ISO 1182:2020, BS EN ISO 1182:2020, or ISO 1182:2010 and meet the criteria specified in Paragraph 8.1.1.2(e).

Table 8.5.2.1: Material Group Numbers for some substrate and coating combinations

Paragraph 8.5.2.1

Substrate[1]	Coating[2]	Group Number (with or without coatings)
a) Concrete and masonry ≥ 15 mm thick; or b) Sheet metal ≥ 0.4 mm thick; or c) Fibre-cement board ≥ 0.4 mm thick; or d) Glass	1) Waterborne or solvent borne paint coatings ≤ 0.4 mm thick; or 2) Polymeric films ≤ 0.2 mm thick	1-S
Gypsum plasterboard with or without paper facing that is: ≥ 9.5 mm thick ≥ 400 kg/m^3 core density < 5% wt organic contribution to board	Waterborne or solvent borne paint coatings ≤ 0.4 mm thick	2-S
Solid wood or wood product that is: ≥ 9.0 mm thick; and ≥ 600 kg/m^3 for particle boards; or ≥ 400 kg/m^3 for all other wood and wood products	Waterborne or solvent borne paint coatings, varnish, or stain ≤ 0.4 mm thick ≤ 100 g/m^2	3

Notes:

(1) These values do not apply to metal faced panels with polymeric substrate.

(2) Coatings must be in good condition and well adhered to the substrate.

8.5.3 Determining a material Group Number based on the Euroclass system and Australian Group Numbers

8.5.3.1 The material Group Number can be assigned using:

a) the classifications from BS EN 13501-1:2018 as shown in Table 8.5.3.1A; or

b) the classifications from AS 5637.1:2015 as shown in Table 8.5.3.1B.

Table 8.5.3.1A: Group Numbers based on classifications from BS EN 13501-1:2018

Paragraph 8.5.3.1

Classifications using BS EN 13501-1:2018	Group Number
Class A1, A2, or B; and Smoke production rating s1 or s2	1-S
Class A1, A2, or B	1
Class C and smoke production rating s1 or s2	2-S
Class C	2
Class D	3
Class E and F	4

Table 8.5.3.1B: Group Numbers based on classifications from AS 5637.1:2015
Paragraph 8.5.3.1

Classifications using AS 5637.1:2015	Group Number
1 with a smoke growth rate index not more than 100	1-S
1	1
2 with a smoke growth rate index not more than 100	2-S
2	2
3	3
4	4

8.5.4 Determining a material Group Number when tested in room corner tests

8.5.4.1 For a material tested to ISO 9705-1:2016, ISO 9705:1993, AS ISO 9705:2003, ISO 13784-1:2014, or ISO 13784-1:2002; the material Group Number shall be determined using the criteria in Table 8.5.4.1.

Table 8.5.4.1: Group Numbers based on testing in room corner tests
Paragraph 8.5.4.1

Heat release rate criteria	Smoke production criteria	Group Number
HRR ≤ 1 MW following exposure to 100 kW for 10 minutes then 300 kW for 10 minutes	Average smoke production rate ≤ 5.0 m^2/s over the period of 0 to 20 minutes	1-S
	–	1
HRR ≤ 1 MW following exposure to 100 kW for 10 minutes	Average smoke production rate ≤ 5.0 m^2/s over the period of 0 to 10 minutes	2-S
	–	2
HRR ≤ 1 MW following exposure to 100 kW for 2 minutes	–	3
HRR > 1 MW following exposure to 100 kW for 2 minutes	–	4

8.5.4.2 The rate of total heat release determined in ISO 9705-1:2016, ISO 9705:1993, AS ISO 9705:2003, ISO 13784-1:2014, and ISO 13784-1:2002 is to include the contribution from both the internal lining and the exposure source (100 kW or 300 kW).

8.5.5 Determining a material Group Number when tested to ISO 5660

8.5.5.1 For a material tested to ISO 5660-1:2015 or ISO 5660-1:2002, the material Group Number is determined using the procedure in Paragraph 8.5.5.3 and must comply with the following:

a) data from the test must be in the form of time and HRR pairs for the duration of the test. The time interval between pairs should not be more than 5 seconds. The end of the test (t_f) is determined as defined in ISO 5660-1:2015 and ISO 5660-1:2002; and

b) data must be obtained by testing the material at 50 kW/m^2 irradiance in the horizontal orientation with edge frame; and

c) at least three replicate specimens must be tested separately with the highest (worst) material Group Number for any specimen taken as the final classification for that material.

8.5.5.2 ISO 5660-1:2015 or ISO 5660-1:2002 are not permitted to determine the Group Number for:

a) metal-skin panel assemblies with combustible core materials; or

b) assemblies where the fire performance is dominated by the construction details rather than the flammability characteristics of the surface material; or

c) cases where, due to the configuration of the material in the test, significant mechanical damage occurs at full scale that does not occur with small horizontal samples; or

d) materials that the accredited test laboratory determines it would not be appropriate to evaluate a specific material using the ISO 5660 test method due to the configuration or other characteristics of the material.

8.5.5.3 To determine the material Group Number from test data for each specimen:

a) determine the time to ignition (t_{ig}) which is defined as the time (in seconds) when the HRR reaches or first exceeds a value of 50 kW/m^2; and then

b) calculate the Ignitability Index (I_{ig}) expressed in reciprocal minutes where:

i) $I_{ig} = \frac{60}{t_{ig}}$; and then

c) calculate the following two HRR indices:

i) $I_{Q1} = \int_{t_{ig}}^{t_f} \left[\frac{q"(t)}{(t - t_{ig})^{0.34}}\right] dt$ and

$I_{Q2} = \int_{t_{ig}}^{t_f} \left[\frac{q"(t)}{(t - t_{ig})^{0.93}}\right] dt$ where

ii) t = time (in seconds), q”(t) = rate of heat release (in kW/m^2) at time t. The definite integral expressions represent the area under a curve from the ignition time until the end of the test, where the parameter is plotted on the vertical axis and time (t) is plotted on the horizontal axis; and then

d) calculate the following three integral limits:

i) $I_{Q,10min} = 6800 – 540I_{ig}$, and

ii) $I_{Q,2min} = 2475 – 165I_{ig}$, and

iii) $I_{Q,12min} = 1650 – 165I_{ig}$; and then

e) classify the material in accordance with Table 8.5.5.3.

Table 8.5.5.3: Group Numbers based on testing to ISO 5660

Paragraph 8.5.5.3

Ignition and Heat release rate criteria	Smoke production criteria	Group Number
$I_{Q1} \le I_{Q,10min}$ and $I_{Q2} \le I_{Q,12min}$; or the HRR does not reach or exceed 50 kW/m^2	Average specific extinction area < 250 m^2/kg	1-S
	–	1
$I_{Q1} \le I_{Q,10min}$ and $I_{Q2} > I_{Q,12min}$	Average specific extinction area < 250 m^2/kg	2-S
	–	2
$I_{Q1} > I_{Q,10min}$ and $I_{Q2} \le I_{Q,2min}$	–	3
$I_{Q1} > I_{Q,10min}$ and $I_{Q2} > I_{Q,2min}$	–	4

8.5.6 Determining a material Group Number for surfaces of ducts for HVAC systems

8.5.6.1 Surfaces of ductwork for HVAC systems can be assigned a material Group Number:

a) of 1-S when the ductwork complies with the fire hazard properties set out in:
   i) for flexible duct, AS 4254.1:2012, or
   ii) for rigid duct, AS 4254.2:2012; or
b) using the methods specified in Subsection 8.5.3, Subsection 8.5.4, or Subsection 8.5.5.

8.5.7 Wall and ceiling elements that include foamed plastics or combustible insulating materials

8.5.7.1 Foamed plastics and metal-skin panel assemblies with combustible insulating materials must meet the flame propagation criteria as specified in:

a) For rigid cellular polyurethan (RC/PUR), AS 1366.1:1992; or
b) for rigid cellular polyisocyanurate (RC/PIR), AS 1366.2:1992; or
c) for moulded rigid cellular polystyrene (RC/PS-M), AS 1366.3:1992; or
d) for extruded rigid cellular polystyrene (RC/PS-E), AS 1366.4:1989.

8.5.7.2 When determining the material Group Number for testing to ISO 5660 or ISO 9705 as specified in Subsection 8.5.4 and Subsection 8.5.5, the test laboratory may decide for elements that include composite layers if:

a) a lesser thickness than the maximum thickness of 50 mm in the ISO 5660 test is appropriate; or
b) if the foamed plastic or combustible insulation may be omitted from the test specimen entirely (ie. when the surface lining is sufficiently robust and well-fixed such that substrate materials are unlikely to influence the outcome of the Group Number classification).

8.5.7.3 Foamed plastics or combustible insulating materials that form part of an element requiring a Group Number can be assumed not to influence the Group Number classification and need not be included in the test specimen when:

a) the surface lining material is a rigid sheet product of gypsum plasterboard, plywood, solid wood, wood composite, fibre-reinforced cement, concrete, or masonry and is not less than 9 mm thick; and
b) it is securely fastened with steel fasteners to a conventional lightweight timber or steel frame or a concrete/masonry wall, according to manufacturers' literature; and
c) all sheet joins are supported and sealed and/or stopped with a non-flaming material.

Appendix A. References

The standards and documents referenced in these specifications must be the editions, along with their specific amendments, listed below.

Standards New Zealand		Where quoted
AS/NZS 1163:2016	Cold-formed structural steel hollow sections	3.4.2.1
AS/NZS 1594:2002	Hot-rolled steel flat products (R2016)	3.4.2.1
AS/NZS 1604.1:2021	Preservative-treated wood-based products – Part 1: Products and treatment	3.5.2.3, Table 3.5.2.4
AS/NZS 1604.3:2002	Specification for preservative treatment – Part 3: Plywood	3.5.1.4
AS/NZS 1604.3:2012	Specification for preservative treatment – Part 3: Plywood	3.5.1.4
AS/NZS 1604.4:2002	Specification for preservative treatment – Part 4: Laminated veneer lumber (LVL)	3.5.1.4
AS/NZS 1604.4:2012	Specification for preservative treatment – Part 4: Laminated veneer lumber (LVL)	3.5.1.4
AS/NZS 1604.5:2002	Specification for preservative treatment – Part 5: Glued laminated timber products	3.5.1.4
AS/NZS 1604.5:2012	Specification for preservative treatment – Part 5: Glued laminated timber products	3.5.1.4
AS/NZS 2588:2018	Gypsum plasterboard (requirements for standard grade)	3.5.3.3
AS/NZS 2908.2:2000	Cellulose-cement products – Flat sheets, where the fibre-cement product	4.2.1.2
AS/NZS 3666.1:2011	Air-handling and water systems of buildings - Microbial control – Part 1: Design, installation and commissioning	7.2.2.2, 7.2.2.3
AS/NZS 3666.2:2011	Air-handling and water systems of buildings - Microbial control – Part 2: Operation and maintenance	7.2.2.2, 7.2.2.3
AS/NZS 3678:2016	Structural steel – Hot-rolled plates, floorplates and slabs, incorporating Amendment 1	3.4.2.1
AS/NZS 3679.1:2016	Structural steel – Part 1: Hot-rolled bars and sections	3.4.2.1
AS/NZS 3679.2:2016	Structural steel – Part 2: Welded I sections	3.4.2.1
AS/NZS 3837:1998	Method of test for heat and smoke release rates for materials and properties using an oxygen consumption calorimeter, incorporating Amendment 1 (R2016)	8.4.1.2, 8.4.1.3
AS/NZS 4666:2012	Insulating glass units	4.4.1.4
AS/NZS 4671:2019	Steel for the reinforcement of concrete	3.2.1.2, 3.2.2.2
AS/NZS 4680:2006	Hot-dipped galvanized (zinc) coatings on fabricated ferrous articles (R2017)	3.4.1.3

References

Standards New Zealand		Where quoted
AS/NZS 4859.1:2018	Thermal insulation materials for buildings – Part 1: General criteria and technical provisions, incorporating Amendment 1	4.5.1.2
NZS 3112.2:1986	Methods of test for concrete – Part 2: Tests relating to the determination of strength of concrete	3.1.1.2
NZS 3404.1:1997	Steel Structures Standard – Part 1	3.4.2.1, 3.4.3.2
NZS 3602:2003	Timber and wood-based products for use in building	3.5.1.3, Table 1C, Table 1D, Table 1E, Table 2B, Table 3.5.2.4
NZS 3604:2011	Timber-framed buildings	2.1.2.3, 4.4.1.1, 4.4.1.2
NZS 3605:2001	Timber piles and poles for use in building	2.1.2.2, 2.1.2.3, 2.1.2.4
NZS 3640:2003	Chemical preservation of round and sawn timber, incorporating Amendments 1,2,3,4,5	3.5.1.3, 3.5.1.4, Table 1C, Table 1D, Table 1E, Table 2B
NZS 4211:2008	Specification for the performance of windows, incorporating Amendment 1	4.4.1.1, Table 4.4.1.3
NZS 4223.1:2008	Glazing in buildings – Part 1: Glass selection and glazing, incorporating Amendment 1	4.4.1.4
NZS 4223.2:2016	Glazing in buildings – Part 2: Insulating glass units	4.4.1.4
NZS 4223.3:2016	Glazing in buildings – Part 3: Human impact safety requirements	4.4.1.4
NZS 4232.2:1988	Performance criteria for fire resisting enclosures – Part 2: Fire resisting glazing systems	8.3.3.1
NZS 4431:2022	Engineered fill construction for lightweight structures	2.1.1.2, Table 2.1.1.2
NZS 4520:2010	Fire-resistant doorsets	8.3.1.1, 8.3.1.4, 8.3.1.2
NZS/AS 1530.1:1994	Methods for fire tests on building materials and structures – Part 1: Combustibility test for materials	8.1.1.2, 8.5.2.2
NZS/BS 476.21:1987	Fire tests on building materials and structures – Part 21: Methods for determination of the fire resistance of loadbearing elements of construction	8.2.1.2
NZS/BS 476.22:1987	Fire tests on building materials and structures – Part 22: Methods for determination of the fire resistance of non-loadbearing elements of construction	8.2.1.2
SNZ TS 4211:2022	Specification for the classification of windows	4.4.1.1, Table 4.4.1.3

These standards can be accessed from www.standards.govt.nz.

References

Standards Australia		Where quoted
AS 1012.1:2014	Methods of testing concrete – Method 1: Sampling of concrete	3.1.1.2
AS 1012.8.1:2014	Methods of testing concrete – Method 8.1: Method for making and curing concrete – Compression and indirect tensile test specimens	3.1.1.2
AS 1012.9:2014	Methods of testing concrete – Method 9: Compressive strength tests – Concrete, mortar and grout specimen	3.1.1.2
AS 1012.14:2018	Methods of testing concrete – Method 14: Method for securing and testing cores from hardened concrete for compressive strength and mass per unit volume	3.1.1.2
AS 1288:2021	Glass in buildings – Selection and installation	4.4.1.4
AS 1289.5.4.3:2006	Methods of testing soils for engineering purposes – Method 5.4.3: Soil compaction and density tests – Compaction control test – Dry density ratio and moisture ratio using statistical selection of reference values (R2016)	2.1.1.3
AS 1366.1:1992	Rigid cellular plastics sheets for thermal insulation – Part 1: Rigid cellular polyurethane (RC/PUR), incorporating Amendment 1 (R2018)	8.5.7.1
AS 1366.2:1992	Rigid cellular plastics sheets for thermal insulation – Part 2: Rigid cellular polyisocyanurate (RC/PIR) (R2018)	8.5.7.1
AS 1366.3:1992	Rigid cellular plastics sheets for thermal insulation – Part 3: Rigid cellular polystyrene – moulded (RC/PS-M), incorporating Amendment 1 (R2018)	8.5.7.1
AS 1366.4:1989	Rigid cellular plastics sheets for thermal insulation – Part 4: Rigid cellular polystyrene – extruded (RC/PS-E) (R2018)	8.5.7.1
AS 1397:2011	Continuous hot-dip metallic coated steel sheet and strip – Coatings of zinc and zinc alloyed with aluminium and magnesium, incorporating Amendment 1	3.4.1.2
AS 1397:2021	Continuous hot-dip metallic coated steel sheet and strip – Coatings of zinc and zinc alloyed with aluminium and magnesium	3.4.1.2
AS 1530.1:1994	Methods for fire tests on building materials, components and structures – Part 1: Combustibility test for materials (R2016)	8.1.1.2, 8.5.2.2
AS 1530.2:1993	Methods for fire tests on building materials and structures – Part 2: Test for flammability of materials (R2016)	8.1.3.1
AS 1530.4:2005	Methods for fire tests on building materials, components and structures – Part 4: Fire-resistance tests of elements of construction	8.2.1.2

References

Standards Australia		Where quoted
AS 1530.4:2014	Methods for fire tests on building materials, components and structures – Part 4: Fire-resistance tests of elements of construction	8.2.1.2
AS 1682.1:1990	Fire dampers – Part 1: Specification	8.3.4.1
AS 1682.1:2015	Fire, smoke and air dampers – Part 1: Specification	8.3.4.1
AS 1682.2:1990	Fire dampers – Part 2: Installation	8.3.4.1
AS 1682.2:2015	Fire, smoke and air dampers – Part 2: Installation	8.3.4.1
AS 2047:2014	Windows and external glazed doors in buildings, incorporating Amendments 1 and 2	4.4.1.1, 4.4.1.2, Table 4.4.1.2, Table 4.4.1.3
AS 3818.3:2010	Timber – Heavy Structural Products – Visually graded – Part 3: Piles	2.1.2.2, 2.1.2.3
AS 3818.10:2010	Timber – Heavy Structural Products – Visually graded – Part 10: Building Poles	2.1.2.4
AS 4072.1:2005	Components for the protection of openings in fire-resistant separating elements – Part 1: Service penetrations and control joints, Amendment 1 (R2016)	8.2.1.3
AS 4254.1:2012	Ductwork for air-handling systems in buildings – Part 1: Flexible duct	8.5.6.1
AS 4254.2:2012	Ductwork for air-handling systems in buildings – Part 2: Rigid duct	8.5.6.1
AS 5113:2016	Classification of external walls of buildings based on reaction-to-fire performance, incorporating Amendment 1	Table 8.4.2.2
AS 5637.1:2015	Determination of fire hazard properties – Part 1: Wall and ceiling linings	8.5.1.2, 8.5.3.1, Table 8.5.3.1B
AS ISO 9705:2003	Fire tests – Full scale room test for surface products (R2016)	8.5.1.2

These standards can be accessed from www.standards.org.au.

ASTM International		Where quoted
ASTM A706/A706M-24	Standard specification for deformed and plain low alloy steel bars for concrete reinforcement	3.2.1.2, 3.2.2.2
ASTM C177-19e1	Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus	4.5.1.3
ASTM C518-21	Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	4.5.1.3
ASTM C687-24	Standard Practice for Determination of Thermal Resistance of Loose-fill Building Insulation	4.5.1.3

References

ASTM International		Where quoted
ASTM C1363-24	Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus	4.5.1.3
ASTM C1667-15	Standard Test Method for Using Heat Flow Meter Apparatus to Measure the Center-of-Panel Thermal Transmission Properties of Vacuum Insulation Panels	4.5.1.3
ASTM C1396/C1396M-24	Standard Specification for Gypsum Board	3.5.3.3
ASTM D2898:2010	Standard practice for accelerated weathering of fire retardant-treated wood (R2017)	8.4.1.4
ASTM D4718/D4718M-15(2023)	Standard Practice for Correction of Unit Weight and Water Content for Soil Containing Oversize Particles	2.1.1.3
ASTM D5874-24	Standard Test Methods for Determination of the Impact Value (IV) of a Soil	Table 2.1.1.2
ASTM E2098-00	Standard Test Method for Determining Tensile Breaking Strength of Glass Fibre Reinforcing Mesh for Use in Class PB Exterior Insulation and Finish Systems (EIFS), after Exposure to a Sodium Hydroxide Solution	4.2.2.3
ASTM E2098M-13	Standard Test Method for Determining Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for Use in Exterior Insulation and Finish Systems (EIFS), after Exposure to a Sodium Hydroxide Solution	4.2.2.3
ASTM E2098M-25	Standard Test Method for Determining Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for Use in Exterior Insulation and Finish Systems (EIFS) and EIFS with Drainage Systems, after Exposure to a Sodium Hydroxide Solution	4.2.2.3
ASTM E2134-01	Standard Test Method for Evaluating the Tensile-Adhesion Performance of an Exterior Insulation and Finish System (EIFS)	4.2.2.4
ASTM E2134M-14	Standard Test Method for Evaluating the Tensile-Adhesion Performance of an Exterior Insulation and Finish System (EIFS)	4.2.2.4

These standards can be accessed from www.astm.org.

British Standards Institution		Where quoted
BS 8414-1:2015+A1:2017	Fire performance of external cladding systems – Part 1: Test method for non-loadbearing external cladding systems applied to the masonry face of a building	Table 8.4.2.2
BS 8414-2:2015+A1:2017	Fire performance of external cladding systems – Part 2: Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel frame	Table 8.4.2.2

References

British Standards Institution		Where quoted
BS EN 335:2013	Durability of wood and wood-based products - Use classes: definitions, application to solid wood and wood-based products	3.5.2.3, Table 3.5.2.4
BS EN 520:2004+A1:2009	Gypsum plasterboards. Definitions, requirements and test methods (requirements for gypsum plasterboard Type A)	3.5.3.3
BS EN 10219-1:2006	Cold formed welded structural hollow sections of non-alloy and fine grain steels, Technical delivery requirements	3.4.2.1
BS EN 10219-2:2019	Cold formed welded structural hollow sections, Tolerances, dimensions and sectional properties	3.4.2.1
BS EN 10219-3:2020	Cold formed welded steel structural hollow sections, Technical delivery conditions for high strength and weather resistant steels	3.4.2.1
BS EN 12101-1:2005+A1:2006	Smoke and heat control systems – Part 1: Specification for smoke barriers	8.2.2.1
BS EN 12467:2012+A2:2018	Fibre-cement flat sheets. Product specification and test methods	4.2.1.2
BS EN 12667:2001	Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance	4.5.1.3
BS EN 12939:2001	Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Thick products of high and medium thermal resistance	4.5.1.3
BS EN 13053:2019	Ventilation for buildings. Air handling units. Rating and performance for units, components and sections	7.2.2.3
BS EN 13501-1:2018	Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests	8.1.1.2, 8.1.1.3, 8.5.1.2, 8.5.3.1, Table 8.5.3.1A
BS EN 14399-3:2015	High-strength structural bolting assemblies for preloading – Part 3: System HR. Hexagon bolt and nut assemblies	3.4.3.2
BS EN 14399-5:2015	High-strength structural bolting assemblies for preloading – Part 5: Plain washers	3.4.3.2
BS EN 16297-1:2012	Pumps. Rotodynamic pumps. Glandless circulators. – Part 1 General requirements and procedures for testing and calculation of energy efficiency index (EEI)	7.2.1.2

References

British Standards Institution		Where quoted
BS EN 16297-2:2012	Pumps. Rotodynamic pumps. Glandless circulators. – Part 2 Calculation of energy efficiency index (EEI) for standalone circulators	7.2.1.2
BS EN 16297-3:2012	Pumps. Rotodynamic pumps. Glandless circulators. – Part 3 Energy efficiency index (EEI) for circulators integrated in products	7.2.1.2
BS EN ISO 1182:2020	Reaction to fire tests for products – Non-combustibility test	8.1.1.2, 8.5.2.2

These standards can be accessed from www.standards.govt.nz.

International Organization for Standardization		Where quoted
ISO 1182:2010	Reaction to fire tests for products – Non-combustibility test	8.1.1.2, 8.5.2.2
ISO 1182:2020	Reaction to fire tests for products – Non-combustibility test	8.1.1.2, 8.5.2.2
ISO 1461:2022	Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods	3.4.1.3
ISO 3575:2016	Continuous hot-dip zinc-coated and zinc-iron alloy-coated carbon steel sheet of commercial and drawing qualities	3.4.1.2
ISO 3575:2025	Continuous hot-dip zinc-coated and zinc-iron alloy-coated carbon steel sheet of commercial and drawing qualities	3.4.1.2
ISO 4998:2023	Steel sheet, zinc-coated and zinc-iron alloy-coated by the continuous hot-dip process, of structural quality	3.4.1.2
ISO 5660-1:2002	Reaction-to-fire tests – Heat release, smoke production and mass loss rate – Part 1: Heat release rate (cone calorimeter method)	8.4.1.2, 8.4.1.3, 8.5.1.2, 8.5.5.1, 8.5.5.2, 8.5.7.2, Table 8.5.5.3
ISO 5660-2:2002	Reaction-to-fire tests – Heat release, smoke production and mass loss rate – Part 2: Smoke production rate (dynamic measurement)	8.5.1.2, 8.5.5.1, 8.5.5.2, 8.5.7.2, Table 8.5.5.3
ISO 5660-1:2015	Reaction to fire tests – Heat release, smoke production and mass loss rate – Part 1: Heat release rate (cone calorimeter method) and smoke production rate (dynamic measurement)	8.4.1.2, 8.4.1.3, 8.5.1.2, 8.5.5.1, 8.5.5.2, 8.5.7.2, Table 8.5.5.3
ISO 8301:1991	Thermal insulation – Determination of steady-state thermal resistance and related properties – Heat flow meter apparatus	4.5.1.3
ISO 8302:1991	Thermal insulation – Determination of steady-state thermal resistance and related properties – Guarded hot plate apparatus	4.5.1.3
ISO 8336:2017	Fibre-cement flat sheets — Product specification and test methods	4.2.1.2

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International Organization for Standardization		Where quoted
ISO 8990:1994	Thermal insulation – Determination of steady-state thermal transmission properties – Calibrated and guarded hot box	4.5.1.3
ISO 9239-1:2010	Reaction to fire tests for flooring – Part 1: Determination of the burning behaviour using a radiant heat source	8.1.2.1
ISO 9364:2017	Steel sheet, 55 % aluminium-zinc alloy-coated by the continuous hot-dip process, of commercial, drawing and structural qualities	3.4.1.2
ISO 9705:1993	Fire tests – full scale room test for surface products	8.5.1.2, 8.5.4.1, 8.5.4.2, 8.5.7.2
ISO 9705-1:2016	Reaction to fire tests – Room corner test for wall and ceiling lining products Part 1: Test method for a small room configuration (R2021)	8.5.1.2, 8.5.4.1, 8.5.4.2, 8.5.7.2
ISO 13784-1:2002	Reaction-to-fire tests for sandwich panel building systems – Part 1: Test method for small rooms	8.5.1.2, 8.5.4.1, 8.5.4.2
ISO 13784-1:2014	Reaction to fire test for sandwich panel building systems – Part 1: Small room test (R2019)	8.5.1.2, 8.5.4.1, 8.5.4.2
ISO 17738-1:2021	Thermal insulation products — Exterior insulation finish systems Part 1: Materials	4.2.2.3
ISO 21887:2007	Durability of wood and wood-based products – Use Classes	3.5.2.3, Table 3.5.2.4

These standards can be accessed from www.standards.govt.nz.

Other standards and publications		Where quoted
AASHTO T 224:2010	American Association of State Highway and Transportation Officials, Standard Method of Test for Correction for Coarse Particles in the Soil Compaction Test. Available from www.transportation.org.	2.1.1.3
AWPA U1-24	American Wood Protection Association, Use Category System: User Specification for Treated Wood. Available from www.awpa.com/.	3.5.2.3, Table 3.5.2.4
BR 135 (2013)	BRE, Fire performance of external thermal insulation for walls of multistorey buildings: Third edition. Available from www.bregroup.com.	Table 8.4.2.2
BRANZ Technical Paper P21 (2010)	A wall bracing test and evaluation procedure. Available online from www.branz.co.nz.	3.5.3.2
European Union Commission Regulation No 622/2012.	Available online from http://www.eur-lex.europa.eu/.	7.2.1.2
DIN 18134:2012-04	German Institute for Standardization, Soil - Testing procedures and testing equipment – Plate load test. Available from www.din.de.	Table 2.1.1.2

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Other standards and publications		Where quoted
NFPA 285:2019	National Fire Protection Association, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components. Available from www.nfpa.org.	Table 8.4.2.2
PD CEN/TS 17006:2016	European Committee for Standardization, Earthworks. Continuous Compaction Control (CCC). Available from www.standards.govt.nz.	Table 2.1.1.2

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