Section H

Multi-Residential | 10/2025

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MULTI-RESIDENTIAL

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INTRODUCTION

Knauf offers a range of NCC compliant fire and acoustic rated building systems for the Multi-Residential sector. These include:

- PartiWall separating walls for Class 1 attached dwellings
- IntRwall separating and corridor walls for Class 2 and 3 buildings with concrete slabs
- Multiframe timber framed construction system for low rise buildings Class 2 and 3.

A brief overview of the above systems and NCC requirements for Multi-Residential buildings is provided below. For more information on various systems refer to the relevant Knauf publications and **knauf.com**

NCC REQUIREMENTS

NOTE

Extracts of NCC requirements provided below are intended for guidance only and should not be used as a substitute for professional advice. Refer to NCC for the full set of performance requirements for Multi-Residential buildings.

Fire Resistance

Fire Resistance Levels

In accordance with NCC, certain elements in multi-residential buildings must achieve stipulated Fire Resistance Levels (FRL).

Class 1 Buildings

Separating walls between Class 1 buildings (ie attached villa units and townhouses) must have an FRL of not less than 60/60/60 from both sides.

Class 2 and 3 Buildings

Building elements in Class 2 and 3 buildings (ie apartments, boarding houses, hotels) must have minimum FRLs depending the type of fire resisting construction ranging from Type A (the most fire resistant) to Type C (the least fire resistant):

TABLE H1: **TYPES OF FIRE RESISTING CONSTRUCTION FOR CLASS 2 AND 3 BUILDINGS**

RISE IN STOREYS	TYPE OF CONSTRUCTION
4 or more	A
3	A
2	B
1	C

Refer to NCC for:
- Calculations of rise in storeys.
- Treatment of buildings with multiple classifications.
- Concession for Class 2 and 3 Buildings.

Minimum FRL's for Class 2 and 3 buildings are outlined in tables H3 and H4.

Class 9c Buildings

Refer to the NCC for fire resistance requirements for Class 9c buildings.

Fire Hazard Properties of Lining Materials

Under the NCC, wall and ceiling lining materials are assigned a group number from Group 1 (best performing) to Group 3 (worst performing) based on their Fire Hazard Properties.

The following table outlines permitted group numbers of wall and ceiling lining materials in Class 2 and 3 buildings (excluding Class 3 buildings used for accommodation for the aged, people with disabilities and children):

TABLE H2: **PERMITTED GROUPS FOR WALL AND CEILING LININGS**

CLASS 2 AND 3 BUILDINGS	FIRE-ISOLATED EXITS & FIRE CONTROL ROOMS	PUBLIC CORRIDORS	SOLE OCCUPANCY UNITS	OTHER AREAS
	WALL/CEILING			
Unsprinklered	1	1, 2	1, 2, 3	1, 2, 3
Sprinklered	1	1, 2, 3	1, 2, 3	1, 2, 3

In addition to the group number, wall and ceiling linings used in a building not fitted with a sprinkler system complying with the NCC must have a smoke growth rate index not more than 100 or an average specific extinction area less than 250m^2/kg.

All Knauf plasterboard linings are Group 1 and comply with the additional requirements for non-sprinklered buildings. Refer to Knauf for details and relevant reports.

Smoke-proof Walls

Public corridors in Class 2 or 3 buildings must be divided at intervals of not more than 40 m with smoke-proof walls complying with Specification S11C3 of NCC.

Structural Tests for Lightweight Construction

Fire-resisting walls of lightweight construction must satisfy the structural test criteria outlined in Specification 6 of NCC.

Non-Combustible Materials

Under Deemed-to-Satisfy Provision C2D10 of the NCC, plasterboard may be used wherever a non-combustible material is required. Where a Class 2 building is constructed using timber framing as permitted in Specification S5C20 of the NCC, insulation in the cavity of a fire-resisting wall must be non-combustible.

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TABLE H3: **MINIMUM FRLs OF BUILDING ELEMENTS IN A CLASS 2 AND 3 BUILDING WITHOUT SPRINKLERS**

BUILDING ELEMENT	TYPE OF FIRE RESISTING CONSTRUCTION				
	TYPE A		TYPE B		TYPE C
	LOAD-BEARING	NON LOAD-BEARING	LOAD-BEARING	NON LOAD-BEARING	LOAD-BEARING
External wall (including any column and other building element incorporated therein) or other external building element, where the distance from any fire-source feature to which it is exposed is:					
Less than 1.5 m	90/90/90	–/90/90	90/90/90	–/90/90	90/90/90 from outside only
1.5 m to less than 3 m	90/60/60	–/60/60	90/60/30	–/60/30	–/–/–
3 m to less than 9 m	90/60/30	–/–/–	90/30/30	–/–/–	–/–/–
9 m to less than 18 m	90/60/30	–/–/–	90/30/–	–/–/–	–/–/–
18 m or more	90/60/30	–/–/–	–/–/–	–/–/–	–/–/–
External Column (not incorporated in an external wall) Distance from a fire-source feature:					
Less than 1.5 m	90/–/–	–/–/–	90/–/–	–/–/–	90/–/–
1.5 m to less than 3 m	90/–/–	–/–/–	90/–/–	–/–/–	–/–/–
3 m or more	90/-/-	–/–/–	90/-/-	–/–/–	–/–/–
18 m or more	90/-/-	-/-/-	-/-/-	-/-/-	-/-/-
Common walls and fire walls	90/90/90	-/90/90	90/90/90	-/90/90	90/90/90
Internal Walls					
Fire-resisting lift shafts	90/90/90	–/90/90	90/90/90	-/90/90	NA
Fire-resisting stair shafts	90/90/90	–/90/90	90/90/90	–/90/90	60/60/60
Bounding public corridors, public lobbies and the like	90/90/90	–/60/60	60/60/60	–/60/60	60/60/60
Between or bounding sole-occupancy units	90/90/90	–/60/60	60/60/60	–/60/60	60/60/60
Ventilating, pipe, garbage and like shafts not used for the discharge of hot products of combustion	90/90/90	–/90/90	–/–/–	–/–/–	–/–/–
Other Load-bearing Internal Walls	90/–/–	NA	60/–/–	NA	–/–/–
Load-bearing Internal Columns	90/–/–	NA	60/–/–	NA	–/–/–
Internal Beams	90/–/–	NA	Ref NCC	NA	Ref NCC
Floors	90/90/90	NA	Ref NCC	NA	NA
Roofs	90/60/30	NA	-/-/-	-/-/-	-/-/-

- Where fire rated internal wall extends to the underside of a ceiling immediately below the roof where concession is given for the roof to be non-fire rated, such ceiling must have Resistance to Incipient Spread of Fire (RISF) of not less than 60 minutes.
- Where the lowest storey is used solely for car parking or some other ancillary purpose, such storey must be separated from the storey above by construction having an FRL of not less than 90/90/90.
- Refer to NCC for concessions for Class 2 and 3 buildings without sprinklers.

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TABLE H4: **MINIMUM FRLs OF BUILDING ELEMENTS IN A CLASS 2 AND 3 BUILDING WITH SPRINKLERS**

BUILDING ELEMENT	TYPE OF FIRE RESISTING CONSTRUCTION				
	TYPE A		TYPE B		TYPE C
	LOAD-BEARING	NON LOAD-BEARING	LOAD-BEARING	NON LOAD-BEARING	LOAD-BEARING
External wall (including any column and other building element incorporated therein) or other external building element Distance from a fire-source feature:					
Less than 1.5 m	90/90/90 from outside 60/60/60 from inside	–/90/90	90/90/90 from outside 60/60/30 from inside	–/90/90	90/90/90 from outside only
1.5 m to less than 3 m	90/60/60 from outside 60/60/60 from inside	–/60/60	90/60/30 from outside 60/60/30 from inside	–/60/30	–/–/–
3 m to less than 9 m	90/60/30 from outside 60/60/30 from inside	–/–/–	90/30/30 from outside 60/30/30 from inside	–/–/–	–/–/–
9 m to less than 18 m	90/60/30 from outside 60/60/30 from inside	–/–/–	90/30/- from outside 60/30/- from inside	–/–/–	–/–/–
18 m or more	90/60/30 from outside 60/60/30 from inside	–/–/–	–/–/–	–/–/–	–/–/–
External Column (not incorporated in an external wall) Distance from a fire-source feature:					
Less than 1.5 m	90/–/–	–/–/–	90/–/–	–/–/–	90/–/–
1.5 m to less than 3 m	90/–/–	–/–/–	90/–/–	–/–/–	–/–/–
3 m or more	90/-/-	–/–/–	90/-/-	–/–/–	–/–/–
18 m or more	90/-/-	-/-/-	-/-/-	-/-/-	-/-/-
Common walls and fire walls	90/90/90	-/90/90	90/90/90	-/90/90	90/90/90
Internal Walls					
Fire-resisting lift shafts	60/60/60	–/–/–	60/60/60	–/–/–	NA
Fire-resisting stair shafts	60/60/60	–/–/–	60/60/60	–/–/–	60/60/60
Bounding public corridors, public lobbies and the like	60/60/60	–/–/–	60/60/60	–/–/–	60/60/60
Between or bounding sole-occupancy units	60/60/60	–/–/–	60/60/60	–/–/–	60/60/60
Ventilating, pipe, garbage and like shafts not used for the discharge of hot products of combustion	60/60/60	–/–/–	–/–/–	–/–/–	–/–/–
Other Load-bearing Internal Walls	60/–/–	NA	60/–/–	NA	–/–/–
Load bearing Internal Columns	90/–/–	NA	60/–/–	NA	–/–/–
Internal Beams	90/–/–	NA	Ref NCC	NA	Ref NCC
Floors	60/60/60	NA	Ref NCC	NA	Ref NCC
Roofs	90/60/30	NA	-/-/-	-/-/-	-/-/-

- Where fire rated internal wall extends to the underside of a ceiling immediately below the roof, where concession is given for the roof to be non-fire rated, such ceiling must have Resistance to Incipient Spread of Fire (RISF) of not less than 60 minutes.
- Where the lowest storey is used solely for car parking or some other ancillary purpose, such storey must be separated from the storey above by construction having an FRL of not less than 90/90/90.
- Non load-bearing internal walls must be lined with 13 mm standard plasterboard each side, be filled with non-combustible insulation (where applicable), and extend in accordance with NCC requirements.
- Refer to NCC for concessions for Class 2 and 3 buildings with sprinklers.

INTRODUCTION

Acoustics

In accordance with the NCC, separating walls and floors in multi-residential buildings must provide minimum levels of acoustic insulation as summarised below:

TABLE H5: **CLASS 9C BUILDINGS**

BUILDING ELEMENT	IMPACT SOUND INSULATION (Separate Leaves)	R_w (min)
Floor	NA	45
Wall separating sole occupancy units or sole occupancy unit from a bathroom, sanitary compartment (not being associated with ensuite), plant room or utilities room	No	45
Wall separating sole occupancy unit from kitchen or laundry	Yes	45

TABLE H6: **CLASS 1 BUILDINGS**

WALL TYPE	DISCONTINUOUS CONSTRUCTION	R_w+C_{tr} (min)
Separating wall between bathroom, sanitary compartment, laundry or kitchen and habitable room (other than kitchen) in adjoining Class 1 building	Yes	50
In all other cases to those listed above	No	50
Duct, soil, waste or water supply pipe or storm water pipe that passes through a separating wall between class 1 buildings if the adjacent room is a habitable room (other than a kitchen)	No	40
As above, if the adjacent room is a kitchen or any other room	No	25

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TABLE H7: **SUMMARY OF NCC ACOUSTIC REQUIREMENTS FOR FLOORS, WALLS AND SERVICES IN CLASS 2 AND 3 BUILDINGS**

APPLICATION	NCC DEEMED-TO-SATISFY PROVISION (Laboratory performance)				NCC VERIFICATION METHOD (in-situ performance)		
	R_w (not less than)	R_w+C_{tr} (not less than)	IMPACT SOUND INSULATION (discontinuous construction, walls only)	$L'_{n,w}$ (not more than – floor only)	$D_{n,Tw}$ (not less than)	$D_{n,Tw}+C_{tr}$ (not less than)	$L'_{n,Tw}$ (not more than – floor only)
Floors separating sole-occupancy units	–	50	–	62	–	45	62
Floors separating a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification	–	50	–	62	–	45	62
Walls separating sole-occupancy units ie habitable rooms adjoining or, non-habitable rooms adjoining	–	50	No	–	–	45	–
Walls separating a sole-occupancy unit from a stairway, public corridor, public lobby or the like	50	–	No	–	45	–	–
Walls separating a sole-occupancy unit from a plant room or lift shaft	50	–	Yes	–	45	–	–
Walls separating a bathroom, sanitary compartment, laundry or kitchen in one sole-occupancy from a habitable room (other than a kitchen) in an adjoining unit	–	50	Yes	–	–	45	–
Duct, soil, waste or water supply pipe, including a duct or pipe that is located in a wall or floor cavity, that serves or passes through more than one sole-occupancy unit if the adjacent room is a habitable room (other than a kitchen)	–	40	–	–	–	–	–
Duct, soil, waste or water supply pipe, including a duct or pipe that is located in a wall or floor cavity, that serves or passes through more than one sole-occupancy unit if the adjacent room is a kitchen or non-habitable room	–	25	–	–	–	–	–

NOTES:
Refer to General Information - Acoustics for:
- Explanation of various sound insulation terms.
- Definition of discontinuous construction.
- Sound insulation ratings of services.

Wet Areas

Wet areas as defined in NCC is an area within a building supplied with water from a water supply system and includes bathrooms, showers, laundries and sanitary compartments.

According to NCC, building elements in wet areas must be waterproof or water resistant depending on the location within a wet area and must comply with AS 3740 *Waterproofing of Domestic Wet Areas.*

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Thermal Insulation

Energy efficiency and thermal requirements for buildings are set out in the NCC and are dependent on many design factors such as geographical Climate Zones, solar absorptance, roof ventilation and construction of building elements. In this Multi-residential section, Knauf have not provided thermal performance of wall systems as described below. Thermal performance information can be made available by contacting our technical support services at tecassist@knauf.com.

Class 1 – Domestic separating walls

For internal residential separating wall system such as Knauf PartiWall system, there is no thermal requirement for separating between two habitable compartments, unless being specifically designed by the Architect or ESD Consultant.

Class 2 – Commercial Multi-residential separating walls.

For internal separating wall system in commercial multi-residential buildings such as IntRwall systems, thermal insulation may be required for each Sole-occupancy unit to comply with Green Star or NatHERS requirement. Consult with Architect or ESD Consultant.

Class 2 and 3

For conventional multi-residential construction, walls, roof and ceilings that form part of a building envelop of Class 2 and 3 must achieve the minimum R-values for various Climate Zones, as outlined in Table H8 below.

TABLE H8: **MINIMUM *R* VALUES FOR CLASS 2 & 3 BUILDINGS**

CLIMATE ZONE	EXAMPLE CITY	ROOF/CEILING CONSTRUCTION (DIRECTION OF HEAT FLOW)	INTERNAL FLOORS WITHOUT AN IN - SLAB HEATING OR COOLING SYSTEM (DIRECTION OF HEAT FLOW)	EXTERNAL WALLS (WHERE THE WALL IS 80% OR MORE OF WALL - GLAZING CONSTRUCTION)	
				CLASS 2 COMMON AREAS	CLASS 3
1	Darwin	3.7 (down)	2.0 (up)	2.4	3.3
2	Brisbane	3.7 (down)	2.0 (down and up)	1.4	1.4
3	Alice Springs	3.7 (down)	2.0 (down and up)	1.4	3.3
4	Broken Hill, Mildura	3.7 (down)	2.0 (down)	1.4	2.8
5	Sydney East, Adelaide, Perth	3.7 (down)	2.0 (down)	1.4	1.4
6	Melbourne, Sydney West, Ballarat	3.2 (down)	2.0 (down)	1.4	2.8
7	Canberra, Hobart	3.7 (up)	2.0 (down)	1.4	2.8
8	Mount Buller	4.8 (up)	3.5 (down)	1.4	3.8

Notes to Tables H8
Refer to the NCC for:
- Full set of Deemed-to-Satisfy Energy Efficiency provisions
- NCC Volume 1 J4D4 Thermal requirement for roof and ceiling construction
- NCC Volume 1 Table J4D6a for minimum wall Total R-Value
- Definition of a building envelope for the purposes of thermal design
- Thermal construction compliance and installation requirements
- Adjustments of minimum R-values for roofs and ceilings to account for loss of ceiling insulation due to exhaust fans, flues, recessed downlights, etc
- Reduction of minimum R-value requirements for external walls to account for their thermal mass, orientation, shading and composition.
- "Wall glazing construction" means the combination of wall and glazing components comprising the envelope of a building, excluding display glazing and opaque non glazed openings such as doors, vents, penetrations and shutters
- Solar absorptance of the upper surface of a roof must not be more than 0.45 for Class 2 and 3 buildings in Climate Zones 1 to 7
- Thermal performance requirements for external walls of Class 2 sole occupancy units must be determined using house energy rating software with load limits as specified in the ABCB Standard for NatHERS Heating and Cooling Load Limits.
- The information shown is for reference only. Refer to ESD engineer or check with local building authorities for minimum insulation and thermal requirements.

INTRODUCTION – PARTIWALL®

MULTI-RESIDENTIAL SYSTEMS

PARTIWALL®

Description

Knauf PartiWall is a family of separating wall systems for Class 1 buildings.

Purpose-designed to suit Australian construction techniques, PartiWall is a twin stud wall system incorporating a 25 mm Shaftliner MouldStop plasterboard fire barrier within the wall cavity. Cavity insulation is placed on one or both sides of the wall as required to achieve stated acoustic ratings.

Shaftliner MouldStop panels are held in position by lightweight H-studs that are fixed to timber or steel framing on both sides with aluminium clips. In the case of fire, aluminium clips on the fire side will melt, while the Shaftliner MouldStop fire barrier is supported by, and provides protection to the structure on the opposite side.

Figure H1: **PartiWall System PWT60.1**

Figure H2: **PartiWall System PWS60.1**

Features and Benefits

- No wet trades required.
- No additional trades required at framing stage.
- Permits easy incorporation of services and service penetrations in internal linings without the need for fire treatment.
- Wall linings are installed at the plastering stage as per normal installation specifications.

NOTE

PartiWall system is designed to provide fire protection to the adjacent dwelling and not to dwellings above or below. As such, PartiWall system is not suitable for use in Class 2 or 3 buildings.

Design Options

PartiWall systems are available in three basic fire rated configurations:

TABLE H9: **PARTIWALL SYSTEM TYPES**

SYSTEM TYPE	FIRE BARRIER	FRL
PWT60.1 / PWS60.1	1x25 mm Shaftliner MouldStop	60/60/60
PWT90.1 / PWS90.1	1x25 mm Shaftliner MouldStop + 1x16 mm FireStop	90/90/90

All fire rated configurations are available with a wide range of outer linings, including hybrid linings with different impact and/or water resistance properties on each side of the wall.

All PartiWall systems listed in this manual achieve acoustic ratings equal to or exceeding R_w+C_{tr} 50 and provide acoustic impact isolation as defined in the NCC (Discontinuous Construction).

Timber and steel framed PartiWall systems have been listed in this manual.

Materials

Fire Barrier

- 25 mm Shaftliner MouldStop
- 16mm FireStop
- 25 mm H-studs
- Rondo 25 mm steel track
- PartiWall aluminium clips
- Knauf Firepack mineral wool packer.

Linings

- 10 mm / 13 mm SHEETROCK ONE
- 10 mm SHEETROCK PLUS
- 13 mm WetStop
- 13 mm ImpactStop
- 6 mm Villaboard fibre cement

PARTIWALL®

Insulation

- KI 90G11 - 90 mm glasswool insulation 11 kg/m^3 density
- KI 90G14 - 90 mm glasswool insulation 14 kg/m^3 density
- KI 90G24 - 90 mm glasswool insulation 24 kg/m^3 density.

Sealant

H.B. Fuller Firesound sealant.

Fasteners

Refer PartiWall brochure for fastener types used in construction of PartiWall system.

Design Considerations

Maximum Heights and Loads

- Overall height of Shaftliner MouldStop fire barrier must not exceed 12.0m using standard installation specifications.
  Special detailing can be adopted to permit PartiWall heights up to 15.0m maximum. Refer to Knauf for details.
- Spacing between aluminium clips supporting H-studs or I-studs must not exceed 3.0m vertically and 600 mm horizontally.
- Timber framing is to be designed for normal service conditions and must comply with AS 1684 *Residential Timber-Framed Construction.*
- Steel framing must be designed by a suitably qualified Structural Engineer to meet NCC requirements, and in accordance with AS 4600 Cold-formed steel structures and other relevant Australian Standards.
- PartiWall is suitable for wind classification N1 and N2 as determined by AS 4055 *Wind Loads for Housing*. Where PartiWall is proposed for higher wind classification areas contact Knauf for advice.

Fire Rating

- Linings in the occupancy areas do not need be fire rated and are constructed using the normal installation and finishing methods outlined in Knauf Plasterboard Installation Manual.
- Normal service penetrations are allowed through outer linings and are not required to be fire rated.
- Service penetrations through Shaftliner MouldStop fire barrier are allowed only in the roof space (refer PartiWall brochure for details of approved penetrations). There should be no other penetrations through the fire barrier.
- Use only the specified PartiWall aluminium clips to attach the H-studs or I-studs to framing members. Other than the clips, there should be no attachments to the fire barrier.

Acoustics

- All PartiWall systems outlined in this manual are covered by acoustical opinion RT&A TK778-21F01 from Acoustical Consultants Renzo Tonin & Associates.
- PartiWall satisfies NCC acoustic requirements for separating walls of $R_w + C_{tr}$ not less than 50 and acoustic impact isolation, and $R_w + C_{tr}$ not less than 25 and $R_w + C_{tr}$ not less than 40 acoustic separation of adjoining soil and waste pipes within the wall cavity. To maintain acoustic performance, service pipes must not be in contact with the Shaftliner MouldStop fire barrier.
- Small penetrations in outer linings (ie switches, power points, light fittings and pipes) do not need to be acoustically sealed, however Shaftliner MouldStop fire barrier base and internal lining junctions with floors must be sealed with H.B. Fuller Firesound sealant.
- Stair stringers and treads should be kept clear of the separating wall in order to reduce the likelihood of stair impact sound travelling through the wall.

Wet Areas

Wet areas (as defined in the NCC) must be waterproofed as per the wet area details contained in Knauf Installation Manual.

PartiWall Systems extending into wet areas must incorporate water resistant linings.

Installation

PartiWall system must be installed strictly in accordance with Knauf installation specifications in order to achieve design fire and acoustic ratings. Refer to PartiWall brochure for installation specifications.

To view the full range of system CAD details, scan QR code below.

INTRODUCTION – INTRWALL®

INTRWALL®

Description

IntRwall system is a non load-bearing separating wall system utilising 25 mm Shaftliner MouldStop plasterboard fire barrier with various configurations of outer linings on both sides. Cavity insulation is placed on one or both sides of the wall as required to achieve stated acoustic ratings.

Shaftliner MouldStop panels are held in position by light gauge steel or H-studs.

Figure H2: **IntRwall System IW60.3**

Features and Benefits

- A simple, panelised lightweight system that can be installed by a plastering contractor.
- All components are manually handled and do not require heavy lifting equipment.
- Easy inspection of acoustic and fire sealing.
- Services can be easily incorporated in the wall cavities.
- If required, the stud centres of the separate lipped stud rows can be reduced so that the system can be used in areas subject to higher than normal pressures.

Design Options

IntRwall systems are available in three primary configurations for intertenancy and corridor walls to achieve FRL -/60/60 from both sides and acoustic ratings up to $R_w + C_{tr}$ 54 with acoustic impact insulation.

Various IntRwall configurations represent different options in regard to the type and fixing of outer linings to suit acoustic performance and service cavity requirements.

Each configuration also provides a number of options in regard to moisture resistance of outer linings on one or both sides of the wall.

Materials

The following materials are used in Knauf IntRwall intertenancy and corridor wall systems:

Linings

- 25 mm Shaftliner MouldStop
- 16 mm FireStop (where required for overpartition and penetration details)
- 13 mm SHEETROCK ONE
- 13 mm WetStop
- 13 mm ImpactStop
- 6 mm Villaboard fibre cement.

Rondo Steel Components

- 25 mm H-stud
- 64 mm C-stud
- 35x35x0.70 mm angle.
- Deflection J-Track (PN 341)

Insulation

- KI 50G11 - 50 mm glasswool insulation 11 kg/m^3 density
- KI 75G11 - 75 mm glasswool insulation 11 kg/m^3 density
- KI 90G11 - 90 mm glasswool insulation 11 kg/m^3 density
- KI 90G14 - 90 mm glasswool insulation 14 kg/m^3 density.

Sealants

- H.B. Fuller Firesound sealant.

Fasteners

Refer to Table A10 in Section A for fasteners used to fix plasterboard to steel framing.

INTRWALL®

Design Considerations

Fire Rating

- IntRwall intertenancy and corridor wall systems have been tested and subsequently assessed at CSIRO laboratories at North Ryde in Sydney. Refer to IntRwall tables for relevant fire reports for both intertenancy and corridor wall systems.
- Services penetrations in Shaftliner MouldStop fire barrier must be treated to maintain fire rating. Refer to Knauf for details.
- Services penetrations in non-fire resistant outer linings are not required to be fire rated.

Structural

The IntRwall system has been tested in Knauf NATA accredited laboratory and satisfies the requirements of the NCC Specification 6.

All intertenancy and corridor IntRwall systems meet NCC requirements for walls generally (max deflection L/240 @ 250 Pa lateral serviceability pressure).

For maximum heights of independent studs in IntRwall systems refer to Steel Stud Walls Lined One Side.

NOTE

In high-rise apartment construction, confirmation of internal design pressures should be obtained from the project Structural Engineer, especially where there are large openings such as sliding glass doors onto balconies. Consult Rondo for stud sizes, heights and spacing for design pressures other than those specified above.

Wet Areas

Wet Areas (as defined in the NCC) must be waterproofed as per the wet area details contained in Knauf Installation Manual.

IntRwall Systems extending into wet areas must incorporate water resistant linings.

Acoustics

The IntRwall system has been the subject of a series of acoustic tests at the CSIRO Acoustic Laboratory at Highett, Victoria.

All IntRwall systems outlined in this manual are covered by Acoustical Opinion TK778-21F01 from Acoustic Consultants Renzo Tonin & Associates.

IntRwall intertenancy wall systems with free standing framing on either side satisfy NCC Discontinuous Construction requirements where a separating wall must provide impact sound isolation.

If services (duct, soil, waste or water supply pipe) are to be located within an IntRwall system and the adjacent dwelling is a habitable room (other than a kitchen), minimum construction on the adjacent dwelling's side in order to achieve NCC acoustic isolation requirement of $R_w + C_{tr}$ 40 must be as follows:

- Minimum 13 mm SHEETROCK ONE plasterboard (or heavier)
- 64 mm free-standing studs
- Minimum 20 mm gap between Shaftliner MouldStop barrier and free standing studs
- Minimum KI 75G11 - 75 mm glasswool insulation 11 kg/m^3 density

All IntRwall systems achieve minimum $R_w + C_{tr}$ 25 required for separation of services where the adjacent room is a kitchen or non-habitable room.

Limitations

- IntRwall is not suitable for use in lift shafts or in other applications where it would be subjected to cyclical loading.
- Independent studs must be checked for pressure and other imposed loads (including shelf loads) as determined by the Project Structural Engineer.
- Penetrations in Shaftliner MouldStop panels are only permitted when installed in accordance with relevant Knauf installation details. Contact Knauf for further information.

Installation

IntRwall system must be installed strictly in accordance with Knauf installation specifications in order to achieve design fire and acoustic ratings. Refer to Knauf IntRwall installation details for further information.

To view the full range of system CAD details, scan QR code below.

INTRODUCTION - MULTIFRAME™

MULTIFRAME™

Description

Multiframe™ is a family of timber framed wall and ceiling systems satisfying NCC Fire Resistance and Acoustic requirements for low rise multi-residential buildings Class 2 and 3 (refer to NCC for height restrictions for timber framed Multi-Residential buildings).

Design Options

Multiframe includes a range of wall and ceiling systems as outlined below. Refer the relevant sections of this manual for configurations and acoustic ratings of various systems.

TABLE H10: **SEPARATING WALLS**

SYSTEM TYPE	NON LOAD-BEARING FRL	LOAD-BEARING FRL
TT60.6	–/60/60	60/60/60
TT90.1	–/90/90	90/90/90
TT120.1	–/120/120	120/120/120

TABLE H11: **CORRIDOR WALLS**

SYSTEM TYPE	NON LOAD-BEARING FRL	LOAD-BEARING FRL
TT60.6	–/60/60	60/60/60
TT90.1	–/90/90	90/90/90
TF90.1	–/90/90	90/90/90
TF120.1	–/120/120	120/120/120

TABLE H12: **LOAD-BEARING INTERNAL WALLS**

SYSTEM TYPE	NON LOAD-BEARING FRL	LOAD-BEARING FRL
TB90.1	–/90/90	90/90/90
TB120.1	–/120/120	120/120/120

TABLE H13: **EXTERNAL WALLS - BRICK VENEER**

SYSTEM TYPE	FRL FORM INSIDE	FRL FROM OUTSIDE
BVT.1	–/–/–	Brick veneer FRL as req'd
BVT30.1	30/30/30	Brick veneer FRL 30/30/30
BVT60.1	60/60/60	Brick veneer FRL 60/60/60
BVT90.1	90/90/90	Brick veneer FRL 90/90/90
BVT120.1	120/120/120	Brick veneer FRL 120/120/120

TABLE H14: **FLOOR/CEILINGS**

SYSTEM TYPE	FRL FROM BELOW	RISF
CT60.1	60/60/60	30 min
CT60.2	60/60/60	60 min
CT90.1	90/90/90	60 min

Features and Benefits

- Cost effective (independent costings are available from Aquenta Consulting)
- Lightweight
- Comprehensive solution (full range of systems to meet NCC requirements)
- Ease of incorporating Knauf thermal and acoustic insulation.

Materials

Refer to the relevant sections of this manual for materials used in Multiframe wall and ceiling systems.

Design Considerations

Fire Rating

Charfactor - Load Bearing Walls

Where relevant load bearing timber framed wall systems are assigned a Charfactor number (CF) to assist Engineers to determine load bearing capacity of timber studs under fire condition. Refer to section D for systems information and Charfactor Design Tables

Insulation Materials

Knauf glasswool insulation satisfies the requirement for non-combustible insulation in fire rated walls in timber framed Class 2 and 3 buildings.

Fire Rated Walls under Ceilings

Where in accordance with NCC a fire rated wall can terminate at the underside of the ceiling with Resistance to Incipient Spread of Fire (RISF) of not less than 60 min, Knauf ceiling systems with 1x13 mm FireStop plasterboard + 1x16 mm FireStop plasterboard satisfy this requirement.

Penetrations

Penetrations in a fire rated system must be treated strictly in accordance with relevant test reports and approved installation details in order to maintain the system's Fire Resistance Level.

Where components by others are specified in Knauf fire rated penetration details (ie. dampers, GPOs, fire collars, etc), such components must be installed in accordance with the manufacturer's specifications. It is the responsibility of the component manufacturer to ensure that the fire rating performance of the system is not affected.

MULTIFRAME™

Acoustics

Structural Flanking

One of the main flanking routes occurs around the wall and floor structure as shown in Figure H3. These routes particularly apply to walls and floors between sole occupancy units but may also apply to external and internal walls within the sole-occupancy unit.

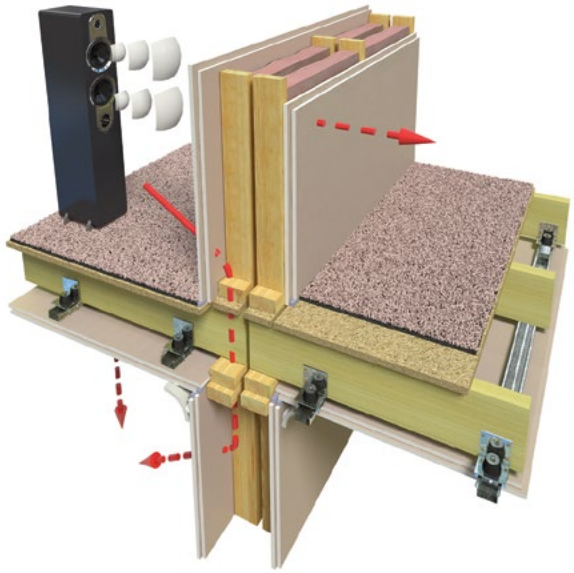


Figure H3: **Flanking and Airborne Noise Pathways Through Floor/Wall Junction**

A recommended solution to minimise structural flanking at wall floor intersections is to fix plasterboard linings to timber studs via 28 mm furring channels with resilient mounts.

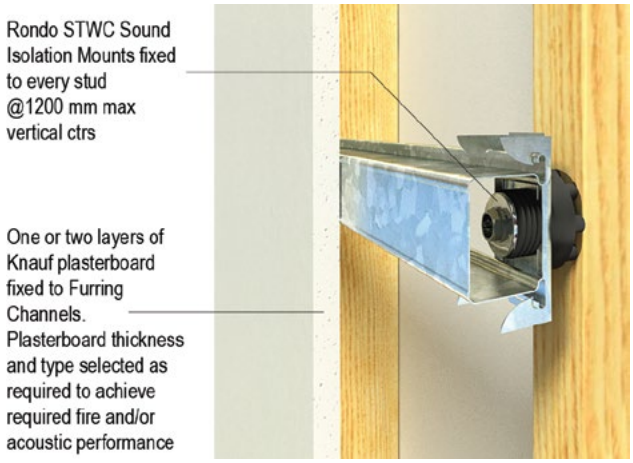


Figure H4: **Furred Lining With Sound Isolation Mounts**

NOTE:

Sound Isolation Mounts may be required to both sides of wall system. Refer to the project Acoustic Consultant for advice on appropriate detailing for flanking sound control.

Floors

The floor systems in this manual are provided with three types of floor coverings; bare timber floor with or without acoustic underlay, carpet and underlay, and ceramic floor tiles with or without acoustic underlay. These floor coverings, in combination with the specified acoustic underlays/mounts and fire rated ceilings underneath, contribute to the overall acoustic performance of the system in order to achieve the minimum acoustic provisions of the NCC.

Consideration should be given to the possibility of occupants changing floor coverings from one type to another that may affect the acoustic performance of the total system. For instance, replacing carpet with timber or another type of floor covering (eg tiles, linoleum), may result in a reduction in acoustic performance that no longer meets the minimum acoustic provisions of the NCC.

Appliances

Noise producing appliances such as dishwashers, clothes dryers, washing machines and pumps should not be affixed to separating walls or should be isolated from the structure with resilient mountings and flexible service leads and connections.

Recessed Light Fittings, Electrical Outlets and Service Pipe Penetrations

Penetrations in fire rated separating walls and ceilings such as recessed light fittings, electrical outlets and supply and return air grilles must themselves be fire rated. The associated detailing of these penetrations for fire rating purposes will also provide an adequate acoustic seal ensuring that the acoustic integrity of the system is maintained.

MULTIFRAME™

Sound Isolation Within Roof Space

In accordance with the NCC, where a wall required to have a minimum sound insulation performance has a roof above, the wall must continue to:

a. the underside of the roof or
b. a ceiling that provides the sound insulation required for the wall.

Where option (b) is adopted, the ceiling must be designed to ensure that the acoustic rating of over partition flanking path matches the performance of the wall.

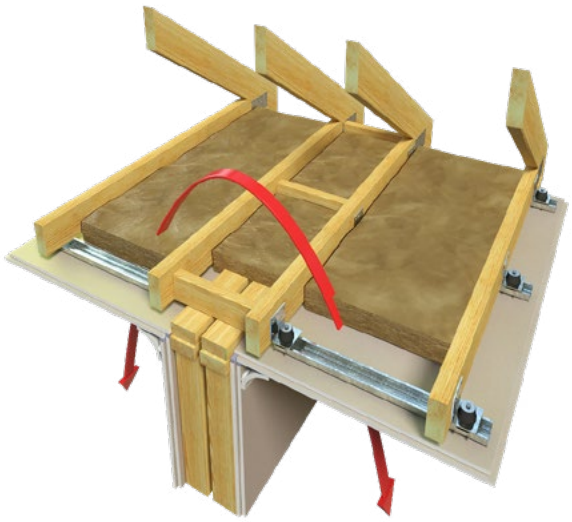


Figure H5: **Sound Isolation in Roof Space**

The following ceiling treatment is required to achieve over partition acoustic rating of R_w+C_{tr} 50 where separating wall terminates at the ceiling:

- The minimum ceiling lining is 1x13 mm FireStop + 1x16 mm FireStop (FRL 60/60/60, RISF 60 min).
- Insulation must be laid over the entire ceiling either side of the wall and must be either minimum KI 90G14 - 90 mm glasswool insulation 14 kg/m^3 density or minimum KI 145G R3.0 - R3.0 Knauf Insulation Ceiling Batts.
- The plasterboard ceiling must not be continuous over the separating wall.
- In the case where ceiling members/roof trusses run perpendicular over the party wall, the ceiling on both sides must be fixed via 28 mm furring channels on Rondo STWC Sound Isolation Mounts or Embelton Ceiling Isolation Hangers to minimise the effects of flanking sound.
- Ceiling penetrations such as A/C ducts and recessed light fittings are required to be fire rated. The associated detailing will provide adequate acoustic seal ensuring that the acoustic integrity of the system is maintained.

Additional treatments will be required for separating walls with specified acoustic performance above R_w+C_{tr} 50. Contact Knauf for further advice.

Structural

Design Loads

Multiframe™ fire rated and acoustic systems are heavier than regular internal partitions and ceilings due to the use of specialised plasterboard linings and other components (ie insulation and furring channels). This increase in weight, together with the weight of the timber framing, must be taken into account when determining dead loads on Multiframe™ systems and supporting structure.

Refer General Information – Materials for weights of various Knauf plasterboard products.

Wet Areas

Wet Areas (as defined in the NCC) must be waterproofed as per the Wet Areas details contained in Knauf Installation Manual and in the Knauf online CAD Finder.

Multiframe wall systems extending into Wet Areas must incorporate water resistant linings.

Installation

Refer to the Knauf online CAD Finder installation instructions for various Multiframe systems.

Services Separation

MULTIFRAME™

As demonstrated in Table H17, fire rated linings of Knauf Multiframe™ systems incorporating lagged or unlagged pipes meet or exceed the minimum NCC requirement of $R_w + C_{tr}$ 25 and $R_w + C_{tr}$ 40 respectively:

TABLE H15: **R_w+C_{tr} ACOUSTIC RATINGS OF KNAUF MULTIFRAME™ PLASTERBOARD LININGS**

PLASTERBOARD LINING CONFIGURATION	UNLAGGED PIPES	LAGGED/CLAD PIPES
1x16 mm FireStop	30	40
1x16 mm FireStop + 1x10 mm SHEETROCK ONE	32	42
2x13 mm FireStop	33	42
1x13 mm FireStop + 1x16 mm FireStop	34	42

- For lagged and clad pipes, any insulation that is listed as part of the system assembly is acceptable.
- Acoustic ratings based on pipe lagged and clad with Soundlag 4525C from Pyrotek Noise Control or similar.

Designers should be aware of the reduction in acoustic performance of wall and ceiling linings due to penetrations such as downlights, exhaust grills, etc. Acoustic advice should be sought from an experienced Acoustician on minimising any reduction in acoustic performance due to penetrations in the wall or ceiling lining.

PARTIWALL®

PWT60.1

FIRE RESISTANCE LEVEL
LB **60/60/60**
FROM BOTH SIDES

FRL Basis: FCO-3359

SYSTEM DESCRIPTION

Side 1:
- Lining (refer to table)
- Timber framing
- 20 mm min gap between timber frame and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 1x25 mm SHAFTLINER MOULDSTOP between 25 mm H-studs @ 600 mm ctrs

Side 2:
- Lining (refer to table)
- Timber framing
- 20 mm min gap between timber frame and fire barrier
- Insulation (refer to table).

ACOUSTIC RATINGS BASIS: RT&A TK778-26F01 — **DISCONTINUOUS CONSTRUCTION**

SYSTEM	SIDE 1		SIDE 2		Insulation (both cavities)	Nom. Wall Width (mm)	R_w (R_w+C_{tr})
	LINING	STUD SIZE (GAP) mm	LINING	STUD SIZE (GAP) mm			
PWT60.1A	1x10 mm SHEETROCK PLUS	70(40)	1x10 mm SHEETROCK PLUS	70(40)	KI 90G14	265	63(50)
	1x10 mm SHEETROCK PLUS	90(20)	1x10 mm SHEETROCK PLUS	90(20)			
PWT60.1D	1x13 mm SHEETROCK ONE	70(40)	1x13 mm SHEETROCK ONE	70(40)	KI 90G14	271	63(50)
	1x13 mm SHEETROCK ONE	90(20)	1x13 mm SHEETROCK ONE	90(20)			
PWT60.1E	1x13 mm SHEETROCK ONE	70(40)	1x13 mm WETSTOP	70(40)	KI 90G11	271	63(50)
	1x13 mm SHEETROCK ONE	90(20)	1x13 mm WETSTOP	90(20)			
PWT60.1F	1x13 mm SHEETROCK ONE	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G14	264	63(50)
	1x13 mm SHEETROCK ONE	90(20)	1x6 mm VILLABOARD	90(20)			
PWT60.1G	1x13 mm WETSTOP	70(40)	1x13 mm WETSTOP	70(40)	KI 90G11	271	62(50)
	1x13 mm WETSTOP	90(20)	1x13 mm WETSTOP	90(20)			
PWT60.1H	1x13 mm IMPACTSTOP	70(20)	1x13 mm IMPACTSTOP	70(20)	KI 90G11	231	65(52)
	1x13 mm IMPACTSTOP	70(40)	1x13 mm IMPACTSTOP	70(40)	KI 90G11 (one cavity only)	271	58(50)
	1x13 mm IMPACTSTOP	90(20)	1x13 mm IMPACTSTOP	90(20)			
PWT60.1I	1x13 mm IMPACTSTOP	70(20)	1x13 mm WETSTOP	70(20)	KI 90G11	231	60(50)
	1x13 mm IMPACTSTOP	70(40)	1x13 mm WETSTOP	70(40)	KI 90G11 (one cavity only)	271	58(50)
	1x13 mm IMPACTSTOP	90(20)	1x13 mm WETSTOP	90(20)			
PWT60.1J	1x13 mm IMPACTSTOP	70(20)	1x6 mm VILLABOARD	70(20)	KI 90G11	224	60(50)
	1x13 mm IMPACTSTOP	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G11 (one cavity only)	264	58(50)
	1x13 mm IMPACTSTOP	90(20)	1x6 mm VILLABOARD	90(20)			
PWT60.1Q	1x6 mm VILLABOARD	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G11	257	63(50)
	1x6 mm VILLABOARD	90(20)	1x6 mm VILLABOARD	90(20)			

* KI 90G11 - 90 mm glasswool insulation 11 kg/m³ density
KI 90G14 - 90 mm glasswool insulation 14 kg/m³ density

For the full range of Knauf systems refer to **knauf.com/en-AU/knauf-gypsum/services/tools/eselector**
Blue text indicates systems and products suitable for wet areas.

PARTIWALL®

PWT90.1

FIRE RESISTANCE LEVEL
LB **90/90/90**
FROM BOTH SIDES

FRL Basis: FC16905-01-1

SYSTEM DESCRIPTION

Side 1:
- Lining (refer to table)
- Timber framing
- 20 mm min gap between timber frame and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 1x25 mm SHAFTLINER MOULDSTOP between 25 mm H-studs @ 600 mm ctrs + 1x16 mm FIRESTOP direct laminated to SHAFTLINER MOULDSTOP

Side 2:
- Lining (refer to table)
- Timber framing
- 20 mm min gap between timber frame and fire barrier
- Insulation (refer to table).

ACOUSTIC RATINGS BASIS: RT&A TK778-26F01 — **DISCONTINUOUS CONSTRUCTION**

SYSTEM	SIDE 1		SIDE 2		Insulation (both cavities)	Nom. Wall Width (mm)	R_w (R_w+C_{tr})
	LINING	STUD SIZE (GAP) mm	LINING	STUD SIZE (GAP) mm			
PWT90.1A	1x10 mm SHEETROCK PLUS	70(20)	1x10 mm SHEETROCK PLUS	70(20)	KI 90G11	241	63(50)
	1x10 mm SHEETROCK PLUS	70(40)	1x10 mm SHEETROCK PLUS	70(40)	KI 90G11	281	64(52)
	1x10 mm SHEETROCK PLUS	90(20)	1x10 mm SHEETROCK PLUS	90(20)			
PWT90.1E	1x13 mm SHEETROCK ONE	70(40)	1x13 mm SHEETROCK ONE	70(40)	KI 90G11	287	69(55)
	1x13 mm SHEETROCK ONE	90(20)	1x13 mm SHEETROCK ONE	90(20)			
PWT90.1F	1x13 mm SHEETROCK ONE	70(40)	1x13 mm WETSTOP	70(40)	KI 90G11	284	70(57)
	1x13 mm SHEETROCK ONE	90(20)	1x13 mm WETSTOP	90(20)			
PWT90.1G	1x13 mm SHEETROCK ONE	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G11	277	70(57)
	1x13 mm SHEETROCK ONE	90(20)	1x6 mm VILLABOARD	90(20)			
PWT90.1I	1x13 mm IMPACTSTOP	70(20)	1x13 mm IMPACTSTOP	70(20)	KI 90G11	247	66(54)
	1x13 mm IMPACTSTOP	70(40)	1x13 mm IMPACTSTOP	70(40)	KI 90G11 (one cavity only)	287	62(50)
	1x13 mm IMPACTSTOP	90(20)	1x13 mm IMPACTSTOP	90(20)			
PWT90.1K	1x13 mm IMPACTSTOP	70(20)	1x13 mm WETSTOP	70(20)	KI 90G11	247	65(55)
	1x13 mm IMPACTSTOP	70(40)	1x13 mm WETSTOP	70(40)	KI 90G11 (one cavity only)	280	61(52)
	1x13 mm IMPACTSTOP	90(20)	1x13 mm WETSTOP	90(20)			
PWT90.1L	1x13 mm IMPACTSTOP	70(20)	1x6 mm VILLABOARD	70(20)	KI 90G11	240	65(55)
	1x13 mm IMPACTSTOP	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G11 (one cavity only)	287	61(52)
	1x13 mm IMPACTSTOP	90(20)	1x6 mm VILLABOARD	90(20)			
PWT90.1R	1x6 mm VILLABOARD	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G11	273	66(53)
	1x6 mm VILLABOARD	90(20)	1x6 mm VILLABOARD	90(20)			

* KI 90G11- 90 mm glasswool insulation 11 kg/m^3 density
PWT90.1 systems require 16 mm FIRESTOP to be laminated at the floor plenum and roof void on the opposite side of the SHAFTLINER MOULDSTOP Fire Barrier. Refer to Knauf for details.

For the full range of Knauf systems refer to **knauf.com/en-AU/knauf-gypsum/services/tools/eselector**
Blue text indicates systems and products suitable for wet areas.

PARTIWALL®

PWS60.1

FIRE RESISTANCE LEVEL
LB **60/60/60**
FROM BOTH SIDES

FRL Basis: FCO-3359

SYSTEM DESCRIPTION

Side 1:
- Lining (refer to table)
- Steel framing
- 20 mm min gap between steel frame and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 1x25 mm SHAFTLINER MOULDSTOP between 25 mm H-studs @ 600 mm ctrs

Side 2:
- Lining (refer to table)
- Steel framing
- 20 mm min gap between steel frame and fire barrier
- Insulation (refer to table).

ACOUSTIC RATINGS BASIS: RT&A TK778-26F01 — **DISCONTINUOUS CONSTRUCTION**

SYSTEM	SIDE 1		SIDE 2		Insulation (both cavities)	Nom. Wall Width (mm)	R_w (R_w+C_{tr})
	LINING	STUD SIZE (GAP) mm	LINING	STUD SIZE (GAP) mm			
PWS60.1A	1x10 mm SHEETROCK PLUS	70(40)	1x10 mm SHEETROCK PLUS	70(40)	KI 90G14	265	63(50)
	1x10 mm SHEETROCK PLUS	90(20)	1x10 mm SHEETROCK PLUS	90(20)			
PWS60.1D	1x13 mm SHEETROCK ONE	70(40)	1x13 mm SHEETROCK ONE	70(40)	KI 90G14	271	63(50)
	1x13 mm SHEETROCK ONE	90(20)	1x13 mm SHEETROCK ONE	90(20)			
PWS60.1E	1x13 mm SHEETROCK ONE	70(40)	1x13 mm WETSTOP	70(40)	KI 90G11	271	63(50)
	1x13 mm SHEETROCK ONE	90(20)	1x13 mm WETSTOP	90(20)			
PWS60.1F	1x13 mm SHEETROCK ONE	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G14	264	63(50)
	1x13 mm SHEETROCK ONE	90(20)	1x6 mm VILLABOARD	90(20)			
PWS60.1G	1x13 mm WETSTOP	70(40)	1x13 mm WETSTOP	70(40)	KI 90G11	271	62(50)
	1x13 mm WETSTOP	90(20)	1x13 mm WETSTOP	90(20)			
PWS60.1H	1x13 mm IMPACTSTOP	70(20)	1x13 mm IMPACTSTOP	70(20)	KI 90G11	231	65(52)
	1x13 mm IMPACTSTOP	70(40)	1x13 mm IMPACTSTOP	70(40)	KI 90G11 (one cavity only)	271	58(50)
	1x13 mm IMPACTSTOP	90(20)	1x13 mm IMPACTSTOP	90(20)			
PWS60.1I	1x13 mm IMPACTSTOP	70(20)	1x13 mm WETSTOP	70(20)	KI 90G11	231	60(50)
	1x13 mm IMPACTSTOP	70(40)	1x13 mm WETSTOP	70(40)	KI 90G11 (one cavity only)	271	58(50)
	1x13 mm IMPACTSTOP	90(20)	1x13 mm WETSTOP	90(20)			
PWS60.1J	1x13 mm IMPACTSTOP	70(20)	1x6 mm VILLABOARD	70(20)	KI 90G11	224	60(50)
	1x13 mm IMPACTSTOP	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G11 (one cavity only)	264	58(50)
	1x13 mm IMPACTSTOP	90(20)	1x6 mm VILLABOARD	90(20)			
PWS60.1Q	1x6 mm VILLABOARD	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G11	257	63(50)
	1x6 mm VILLABOARD	90(20)	1x6 mm VILLABOARD	90(20)			

* KI 90G11- 90 mm glasswool insulation 11 kg/m^3 density
* KI 90G14- 90 mm glasswool insulation 14 kg/m^3 density

For the full range of Knauf systems refer to **knauf.com/en-AU/knauf-gypsum/services/tools/eselector**
Blue text indicates systems and products suitable for wet areas.

PWS90.1

FIRE RESISTANCE LEVEL
LB **90/90/90**
FROM BOTH SIDES

FRL Basis: FCO-16905-01-1

SYSTEM DESCRIPTION

Side 1:
- Lining (refer to table)
- Steel framing
- 20 mm min gap between steel frame and fire barrier
- Insulation (refer to table)

Fire Barrier:
- 1x25 mm SHAFTLINER MOULDSTOP between 25 mm H-studs @ 600 mm ctrs + 1x16 mm FIRESTOP laminated to SHAFTLINER MOULDSTOP @ 400 ctrs

Side 2:
- Lining (refer to table)
- Steel framing
- 20 mm min gap between steel frame and fire barrier
- Insulation (refer to table).

ACOUSTIC RATINGS BASIS: RT&A TK778-26F01 — **DISCONTINUOUS CONSTRUCTION**

SYSTEM	SIDE 1		SIDE 2		Insulation (both cavities)	Nom. Wall Width (mm)	R_w (R_w+C_{tr})
	LINING	STUD SIZE (GAP) mm	LINING	STUD SIZE (GAP) mm			
PWS90.1A	1x10 mm SHEETROCK PLUS	70(20)	1x10 mm SHEETROCK PLUS	70(20)	KI 90G11	241	63(50)
	1x10 mm SHEETROCK PLUS	70(40)	1x10 mm SHEETROCK PLUS	70(40)	KI 90G11	281	64(52)
	1x10 mm SHEETROCK PLUS	90(20)	1x10 mm SHEETROCK PLUS	90(20)			
PWS90.1E	1x13 mm SHEETROCK ONE	70(40)	1x13 mm SHEETROCK ONE	70(40)	KI 90G11	287	69(55)
	1x13 mm SHEETROCK ONE	90(20)	1x13 mm SHEETROCK ONE	90(20)			
PWS90.1F	1x13 mm SHEETROCK ONE	70(40)	1x13 mm WETSTOP	70(40)	KI 90G11	284	70(57)
	1x13 mm SHEETROCK ONE	90(20)	1x13 mm WETSTOP	90(20)			
PWS90.1G	1x13 mm SHEETROCK ONE	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G11	277	70(57)
	1x13 mm SHEETROCK ONE	90(20)	1x6 mm VILLABOARD	90(20)			
PWS90.1I	1x13 mm IMPACTSTOP	70(20)	1x13 mm IMPACTSTOP	70(20)	KI 90G11	247	66(54)
	1x13 mm IMPACTSTOP	70(40)	1x13 mm IMPACTSTOP	70(40)	KI 90G11 (one cavity only)	287	62(50)
	1x13 mm IMPACTSTOP	90(20)	1x13 mm IMPACTSTOP	90(20)			
PWS90.1K	1x13 mm IMPACTSTOP	70(20)	1x13 mm WETSTOP	70(20)	KI 90G11	247	65(55)
	1x13 mm IMPACTSTOP	70(40)	1x13 mm WETSTOP	70(40)	KI 90G11 (one cavity only)	280	61(52)
	1x13 mm IMPACTSTOP	90(20)	1x13 mm WETSTOP	90(20)			
PWS90.1L	1x13 mm IMPACTSTOP	70(20)	1x6 mm VILLABOARD	70(20)	KI 90G11	240	65(55)
	1x13 mm IMPACTSTOP	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G11 (one cavity only)	287	61(52)
	1x13 mm IMPACTSTOP	90(20)	1x6 mm VILLABOARD	90(20)			
PWS90.1R	1x6 mm VILLABOARD	70(40)	1x6 mm VILLABOARD	70(40)	KI 90G11	273	66(53)
	1x6 mm VILLABOARD	90(20)	1x6 mm VILLABOARD	90(20)			

* KI 90G11- 90 mm glasswool insulation 11 kg/m^3 density

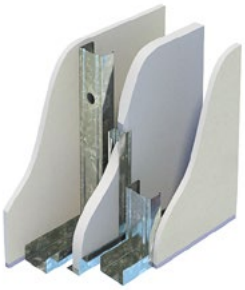
NOTE:
PWS90.1 requires additional 16 mm FIRESTOP to be laminated at the floor plenum and roof void on the opposite side of the SHAFTLINER MOULDSTOP Fire Barrier, as per the installation procedure

INTRWALL® SEPARATING WALLS

IW60.3

FIRE RESISTANCE LEVEL
NLB **-/60/60**
FROM BOTH SIDES

FRL Basis: FCO-3367



SYSTEM DESCRIPTION

Side 1:
- Lining (refer to table)
- 64 mm C-studs @ 600 mm ctrs
- Gap between C-studs and fire barrier (refer to table)
- Insulation (refer to table)

Fire Barrier:
- 1x25 mm SHAFTLINER MOULDSTOP between 25 mm H-studs @ 600 mm ctrs

Side 2:
- Lining (refer to table)
- 64 mm C-studs @ 600 mm ctrs
- Gap between C-studs and fire barrier (refer to table)
- Insulation (refer to table).

ACOUSTIC RATINGS BASIS: RT&A TK778-21F01 — **DISCONTINUOUS CONSTRUCTION**

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH (Gaps Side 1 / Side 2) mm	INSULATION*	R_w (R_w+C_{tr})
IW60.3A	1x13 mm SHEETROCK ONE	1x13 mm SHEETROCK ONE	271(46/46)	KI 90G14 (both cavities)	65(50)
IW60.3D	1x13 mm WETSTOP	1x13 mm WETSTOP	251(36/36)	KI 90G11 (both cavities)	67(52)
IW60.3F	1x13 mm SHEETROCK ONE	1x13 mm WETSTOP	251(36/36)	KI 90G11 (both cavities)	66(51)
IW60.3N	1x13 mm SHEETROCK ONE	1x6 mm VILLABOARD	244(36/36)	KI 90G11 (both cavities)	65(50)
IW60.3V	1x13 mm IMPACTSTOP	1x13 mm IMPACTSTOP	219(20/20)	KI 75G11 (both cavities)	66(51)
IW60.3W	1x13 mm IMPACTSTOP	1x13 mm WETSTOP	239(30/30)	KI 90G11 (both cavities)	67(52)
IW60.3X	1x13 mm IMPACTSTOP	1x6 mm VILLABOARD	232(30/30)	KI 90G11 (both cavities)	67(51)

* KI 75G11 - 75 mm glasswool insulation 11 kg/m³ density
KI 90G11 - 90 mm glasswool insulation 11 kg/m³ density
KI 90G14 - 90 mm glasswool insulation 14 kg/m³ density

NOTE:
Non-fire rated linings permitted to terminate at or above ceiling level for IW60.3 provided that 16 mm FIRESTOP is laminated to one side of the SHAFTLINER MOULDSTOP barrier in accordance with the Knauf overpartition detail. Refer to Knauf for details.

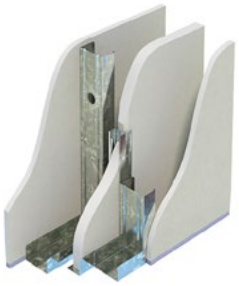
For the full range of Knauf systems refer to **knauf.com/en-AU/knauf-gypsum/services/tools/eselector**
Blue text indicates systems and products suitable for wet areas.

INTRWALL® CORRIDOR WALLS

IW60.4

FIRE RESISTANCE LEVEL
NLB **-/60/60**
FROM BOTH SIDES

FRL Basis: FCO-3367



SYSTEM DESCRIPTION

Side 1:
- Lining (refer to table)
- 64 mm C-studs @ 600 mm ctrs
- Gap between C-studs and fire barrier (refer to table)
- Insulation (refer to table)

Fire Barrier:
- 1x25 mm SHAFTLINER MOULDSTOP between 25 mm H-studs @ 600 mm ctrs

Side 2:
- Lining (refer to table)
- 64 mm C-studs @ 600 mm ctrs
- Gap between C-studs and fire barrier (refer to table)
- Insulation (refer to table).

ACOUSTIC RATINGS BASIS: RT&A TK778-21F01

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH (Gaps Side 1 / Side 2) mm	INSULATION*	R_w (R_w+C_{tr})
IW60.4A	1x13 mm SHEETROCK ONE	1x13 mm SHEETROCK ONE	199(20/0)	KI 50G11 (side 1 cavity)	51(37)
IW60.4B	1x13 mm SHEETROCK ONE	1x13 mm WETSTOP	199(20/0)	KI 50G11 (side 1 cavity)	55(41)
IW60.4C	1x13 mm SHEETROCK ONE	1x6 mm VILLABOARD	192(20/0)	KI 50G11 (side 1 cavity)	55(41)
IW60.4J	1x6 mm VILLABOARD	1x6 mm VILLABOARD	185(20/0)	KI 50G11 (side 1 cavity)	56(43)

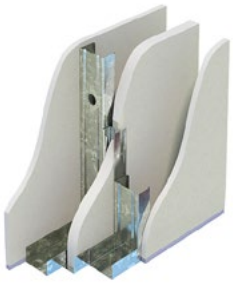
* KI 50G11 - 50 mm glasswool insulation 11 kg/m³ density

NOTE:
Non-fire rated linings permitted to terminate at or above ceiling level for IW60.4 provided that 16 mm FIRESTOP is laminated to Side 1 of the SHAFTLINER MOULDSTOP barrier in accordance with the Knauf overpartition detail. Refer to Knauf for details.

IW60.5

FIRE RESISTANCE LEVEL
NLB **-/60/60**
FROM BOTH SIDES

FRL Basis: FCO-3367



SYSTEM DESCRIPTION

Side 1:
- Lining (refer to table)
- 64 mm C-studs @ 600 mm ctrs
- Gap between C-studs and fire barrier (refer to table)
- Insulation (refer to table)

Fire Barrier:
- 1x25 mm SHAFTLINER MOULDSTOP between 25 mm H-studs @ 600 mm ctrs

Side 2:
- Lining (refer to table)
- 64 mm C-studs @ 600 mm ctrs
- Gap between C-studs and fire barrier (refer to table)
- Insulation (refer to table).

ACOUSTIC RATINGS BASIS: RT&A TK778-21F01

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH (Gaps Side 1 / Side 2) mm	INSULATION*	R_w (R_w+C_{tr})
IW60.5A	1x13 mm SHEETROCK ONE	1x13 mm SHEETROCK ONE	179(0/0)	KI 50G11 (side 1 cavity)	51(37)
IW60.5C	1x13 mm SHEETROCK ONE	1x6 mm VILLABOARD	172(0/0)	KI 50G11 (side 1 cavity)	52(38)

* KI 50G11 - 50 mm glasswool insulation 11 kg/m³ density

NOTE:
Non-fire rated linings must extend full height to the underside of the concrete slab above. Linings are not permitted to terminate at ceiling level for IW60.5.

For the full range of Knauf systems refer to **knauf.com/en-AU/knauf-gypsum/services/tools/eselector**
Blue text indicates systems and products suitable for wet areas.