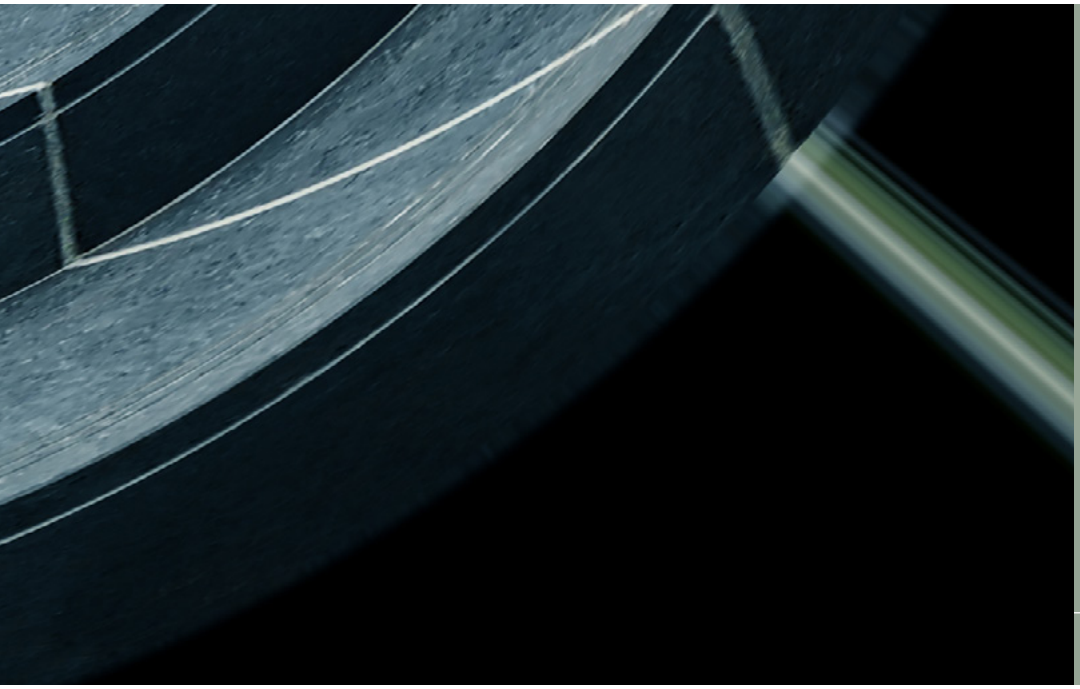


Section I

Specialty Systems | 10/2025

Click on the side tabs to return to section contents page

SPECIALTY SYSTEMS

Click on the links below to navigate to page

INTRODUCTION

The following Knauf Specialty Systems are outlined in this manual:

- Services Shafts
  - Shaftwall
  - Ventshaft
- Cross Laminated Timber (CLT)
- Column and Beam Protection
- Fire Tunnel
- Soil & Waste Pipe Systems

SERVICES SHAFTS

NCC Requirements

Fire Rating

- Refer to Multi-Residential section for fire rating requirements for services shafts in Class 2 and 3 buildings.
- Refer to NCC for fire ratings requirements for services shafts in other Classes of buildings.

Acoustics

- Refer Multi-residential section for NCC requirements for ducts, soil, waste and water supply pipes.

Structural

Refer to NCC for structural requirements for services shafts.

SHAFTWALL

Description

Shaftwall systems utilise 25 mm Shaftliner MouldStop friction fit between Rondo CH-Studs, and FireStop plasterboard screw fixed on one or both sides of the wall.

Most Shaftwall systems outlined in this manual can be fully constructed from one side and can be used for enclosure of services shafts.

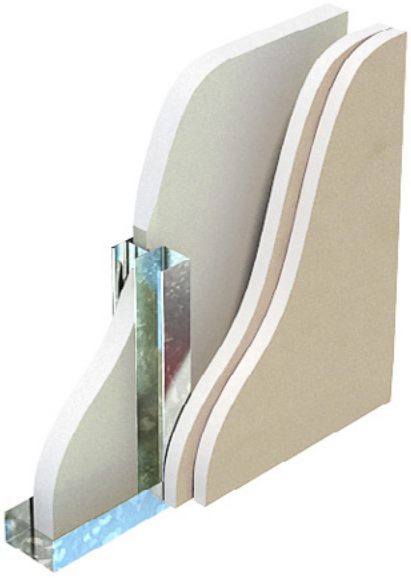


Figure I1: **Shaftwall**

Design Options

Shaftwall systems are available with various configurations of FireStop linings achieving Fire Resistance Levels up to -/120/120 from both sides and acoustic ratings up to R_w 52 (R_w+ C_{tr} 42).

A number of stud sizes and thicknesses are available allowing construction of some Shaftwall systems up to 5.5 m (refer to Shaftwall Maximum Wall Heights table).

Materials

Plasterboard Linings

- 25 mm Shaftliner MouldStop
- 13 mm FireStop
- 16 mm FireStop
- 16 mm MultiStop ONE

Steel Sections

The following Rondo steel sections are utilised in Shaftwall systems:

TABLE I1: **RONDO SHAFTWALL COMPONENTS**

SECTION TYPE & SIZE	SECTION SIZE	BASE METAL THICKNESS
CH-stud	64 mm and 102 mm	0.55 mm and 0.90 mm
E-stud	64 mm and 102 mm	0.55 mm and 0.90 mm
J-track	64 mm and 102 mm	0.80 mm
Deflection track	64 mm and 102 mm	0.80 mm

Figure I2: **CH-Stud**

Insulation

- KI 50G11 - 50 mm glasswool insulation 11 kg/m^3 density.

Screws

Refer to General Information — Materials section for plasterboard screw types.

Sealants and Packers

- H.B. Fuller Firesound™ sealant
- IBS intumescent rod.

SHAFTWALL

Design Considerations

- Refer to NCC for performance requirements for services shafts.
- Refer to Knauf Shaftwall brochure for Shaftwall design considerations.

Notes to Shaftwall Height Tables:

- Symbols:

  d = deflection limits

  h = head track capacity limits

  f = fire height limits.
- Minimum yield stress of steel sections to be 270 MPa.
- Deflection limit is height/240 to a maximum of 20 mm for CH-studs.
- Wall heights tabled are for single length studs at maximum centres shown.
- Wall heights tabled are not for axial loads but include self-weight and lateral pressures stated.
- Wall heights tabled are not applicable to steel lipped C-studs.
- Shelf loading is not permitted for tabulated maximum wall heights. Refer Knauf for maximum heights with shelf loadings.
- Tabulated heights are for internal walls only.
- All plasterboard is to be manufactured by Knauf.
- Walls are to be constructed with FireStop plasterboard to Knauf standard Shaftwall fire rated wall details as appropriate.
- For fire service 50 Pa pressure assumed. Where pressures are >50 Pa and fire loadings are likely to be coincident, Knauf should be consulted.
- Framing components and connections must be suitably designed by the project structural engineer in accordance with AS 1170.4 Earthquake Actions and other relevant Standards for use in seismic applications.

Installation

Refer to Knauf Shaftwall brochure or online CAD Finder for systems installation instructions and details.

VENTSHAFT

Description

Ventshaft is a family of laminated wall systems utilising 25 mm Shaftliner MouldStop and FireStop plasterboard.
Some Ventshaft systems outlined in this manual incorporate free-standing steel or timber stud wall with 10 mm SHEETROCK ONE plasterboard lining.

Ventshaft systems can be fully constructed from one side and are suitable for enclosure of services shafts.

Figure I3: **Ventshaft**

Design Options

Ventshaft systems are available in Fire Resistance Levels up to –/120/120 from both sides and acoustic ratings up to *R_w 53 (R_w+ C_{tr} 45)*.

Materials

Plasterboard Linings

- 25 mm Shaftliner MouldStop
- 13 mm FireStop
- 16 mm FireStop

Steel Sections

- 35 mm x 35 mm galv angle 0.70 mm BMT.

Screws

- Plasterboard laminating screws (Type L)
- Plasterboard to steel frame screws (Type S).

Refer to Knauf Ventshaft brochure for plasterboard screw type specification.

Sealants and Packers

- H.B. Fuller Firesound™ sealant
- IBS intumescent rod.

Insulation (Systems VST120.1A & VSS120.1A)

- KI 50G11 - 50 mm glasswool insulation 11 kg/m^3 density.

Design Considerations

- Refer to NCC for performance requirements for services shafts.
- Static pressure testing of Ventshaft VS120.1A and resistance to impact testing to NCC Specification 6 was carried out at Knauf NATA accredited laboratory. Consulting Engineers Taylor Thomson Whitting observed the static testing, and maximum Ventshaft VS120.1A panel sizes were subsequently computed as listed in the Max Ventshaft Panel Size table.
- Impact resistance testing on 3000x3000 mm Ventshaft VS120.1A panel show the panel to meet NCC criteria for bag drop heights of 100 mm and 150 mm.

Installation

Refer to Knauf Ventshaft brochure or online CAD Finder for systems installation instructions and details.

CROSS LAMINATED TIMBER (CLT)

Introduction

In recent years, the construction industry has been undergoing a remarkable transformation, with a shift towards sustainable and eco-friendly practices. One innovation that is gaining significant attention is Cross Laminated Timber (CLT) systems. This revolutionary building material is paving the way for a more sustainable and efficient construction future.

The next generation of massive timber building systems is transforming how buildings in Australia are designed and constructed. As the demand for sustainable and cost-effective building materials increases, developers, builders and architects have turned to CLT as a viable solution for low-medium rise buildings up to 25 meters.

What is Cross Laminated Timber?

CLT is a cutting-edge engineered wood product that is revolutionising the way we build. It consists of multiple layers of timber planks stacked in alternating directions and bonded together with structural adhesives. This unique composition ensures remarkable strength, stability, and durability. With its prefabricated nature, CLT enables faster construction, reducing project timelines significantly. CLT walls are structural elements and can be used in place of concrete walls, precast concrete walls, light framed timber stud walls and many other load bearing wall structures.

Sustainability at the Core

One of the key advantages of CLT is its exceptional sustainability. Timber is a natural and renewable resource and using timber as a primary building product ensures carbon sequestration. Carbon sequestration means that when a tree is harvested, the carbon it has sequestered during its natural lifecycle is retained within its cellular structure. Unlike traditional construction materials such as concrete and steel, CLT is harvested from sustainably managed forests. This process helps reduce the carbon footprint associated with construction projects.

Timber is the only major building material that is renewable, recyclable, and has a lower carbon footprint throughout its life cycle. By incorporating CLT into buildings, the carbon can be effectively locked away for the lifespan of the structure. This makes CLT an invaluable tool in the fight against climate change.

Knauf CLT Systems

Constantly innovating to deliver valued solutions to the Australian building industry, in conjunction with CLT manufacturer, XLAM, Knauf have developed building code-compliant Wall and Floor/Ceiling systems for multi-residential buildings but also suitable for other building segments.

Knauf CLT systems are lightweight solutions, incorporating familiar and already established plasterboard systems construction methodologies to suit a variety of applications and performance requirements such as but not limited to fire resistance, acoustics and wet areas.

Knauf CLT systems have been successfully used in a variety of projects throughout Australia, including the landmark Adelaide Oval Hotel, Monash University Frankston student accommodation, La Trobe University student accommodation and many others.

CROSS LAMINATED TIMBER (CLT)

Design Considerations

Fire Resistance

- Knauf CLT systems satisfy the requirements of the National Construction Code (NCC) for fire protected timber (Massive Timber) and suitable for buildings with an effective height of 25 meters.
- Knauf utilise 16 mm FireStop as a non-combustible fire-protective covering fixed to CLT walls on both sides to achieve FRL 120/120/120 from both directions.
- Knauf utilises 16 mm FireStop as a non-combustible fire-protective covering fixed to the underside of CLT floors to achieve FRL 120/120/120.
- Knauf CLT and XLAM systems are supported by fire tests at CSIRO laboratories at North Ryde in Sydney, and assessments by CSIRO, Warringtonfire and BRANZ.

Structural and Seismic

- CLT walls and floors are to be designed to relevant Australian Standards, NCC and project requirements. Refer to XLAM for design and details.
- Knauf CLT systems utilise Rondo steel components and are to be designed to relevant Australian Standards, NCC and project requirements. Refer to Rondo for design and details.

Acoustics

- Knauf CLT systems' acoustic ratings provided in this publication and other Knauf manuals are independently provided by PKA Acoustic Consulting.
- Knauf CLT systems utilise Knauf Insulation glasswool in the wall and ceiling cavities to achieve the stated acoustic ratings. It also satisfies NCC requirement for cavity filled non-combustible insulation.
- Knauf CLT inter-tenancy walls can satisfy NCC requirement of $R_W + C_{tr}$ not less than 50, discontinuous construction and acoustic impact insulation.
- Knauf CLT corridor walls can satisfy NCC requirement of R_W not less than 50.
- For other Knauf CLT systems acoustic performance, refer to Systems+ and/or Knauf online tools.

Thermal

- Knauf CLT systems have been independently certified by James M Fricker P/L to achieve stated thermal performance in accordance with AS 4859:2018.
- Knauf CLT systems provides Total R-value performance for various wall and floor/ceiling configurations to meet requirements of the NCC
- Knauf CLT external walls achieve a Total R-value from $R_{t(sum)}$ R3.61 and $R_{t(win)}$ R3.71.
- Knauf CLT floor/ceiling systems achieve a Total R-value from $R_{t(sum)}$ R2.63 and $R_{t(win)}$ R2.50.
- Other Knauf CLT internal walls achieve a Total R-Value from R1.1 onwards.

Design and BIM Details

- Knauf CLT systems have been incorporated in BIM Wizard® Revit and ArchiCAD, which streamlines the process of selecting, designing and creating the correct specification for CLT wall and floor/ceiling systems
- Knauf CLT systems can also be easily selected and specified using Knauf eSelector
- Knauf CLT systems CAD details are available on our CAD Finder, scan QR code below.

Installation

For installation details refer to Knauf online CAD Finder or contact TecASSIST™ for information.

COLUMN & BEAM

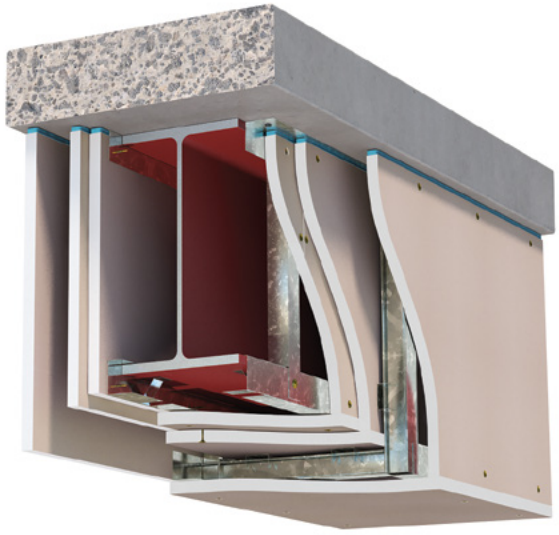
Description

Knauf Column & Beam Protection systems utilise fire resistant plasterboard for fire protection of various types of columns and beams.

Fire protection systems are available for the following types of columns and beams:

- Free standing concrete columns
- Free standing I-section, CHS and SHS steel columns
- Steel columns within a fire rated wall
- Free standing timber columns
- Steel beams under concrete floor
- Timber beams under fire rated floor.

Figure I4: **Beam Protection System PSB120.1D**



Materials

Plasterboard Linings

- 25 mm Shaftliner MouldStop
- 13 mm FireStop
- 16 mm FireStop

Steel Sections

Refer systems tables and Knauf Column & Beam Protection brochure.

Screws

Refer to General Information — Materials for plasterboard screw types.

Sealants

H.B. Fuller Firesound™ sealant

Design Considerations

- Refer to NCC for fire rating requirements for load bearing columns and beams.
- Load bearing columns and beams are to be designed in accordance with NCC and relevant Australian Standards.

Installation

Refer to Knauf Column & Beam Protection brochure or online CAD Finder for systems installation instructions and details.

Design Options

Steel column protection systems are available with Fire Resistance Levels up to 120/–/–.

Concrete and timber column protection systems are available with Fire Resistance Levels up to 120/–/–.

Steel and timber beam protection systems are available with Fire Resistance Levels up to 120/–/–.

FIRE TUNNEL™

Description

Knauf Fire Tunnel provides a lightweight solution for fire isolated passageways as outlined in the NCC.

Fire Tunnel is a self-supported steel framed system constructed using Rondo 150 mm stud and track and lined with Knauf FireStop plasterboard inside and outside.

Figure I5: **Fire Tunnel**

Design Options

Knauf Fire Tunnels are available with Fire Resistance Levels up to –/120/120 from both sides.

Fire Tunnels can be constructed without structural design calculations to an internal width of 2000 mm, and an internal height of 2200 mm. Refer to Rondo if larger size Fire Tunnel is required.

Materials

Plasterboard

- 25 mm Shaftliner MouldStop
- 13 mm FireStop
- 16 mm FireStop
- 10 mm SHEETROCK ONE

Rondo Steel Sections

- 150 mm C-stud 0.75 mm BMT
- 150 mm track 0.75 mm BMT
- 75 mm x 75 mm steel angle 0.70 mm BMT.

Fasteners

- 10x16 Drill Point Wafer Head screws
- 6x3 dia all steel pop rivets
- 6x32, 8x60 Needle Point screws.

Design Considerations

- Refer to NCC for fire rating requirements for Fire Isolated Passageways.
- Refer to Knauf Fire Tunnel brochure for Fire Tunnel design considerations.
- Fire Tunnel systems are designed to support their own weight only. Fire Tunnel roof is not trafficable and must not be used for storage of materials or equipment.

Installation

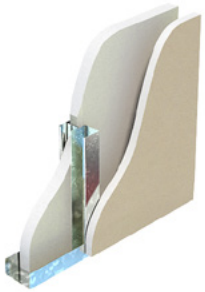
Refer to Knauf online CAD Finder for systems installation instructions and details.

SERVICES SHAFTS – SHAFTWALL

SH

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FC16109, FC15815



SYSTEM DESCRIPTION

Side 1:
1x25 mm SHAFTLINER MOULDSTOP (+ 1x16 mm FIRESTOP if specified). IBS rod at the top of SHAFTLINER MOULDSTOP

Framing:
Steel CH-studs (refer to table)

Insulation:
Refer to table

Side 2:
One or more layers of fire resistant pbd.

ACOUSTIC RATINGS BASIS: RT&A TE405-20S10

SYSTEM	FRL	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	INSULATION* STUD SIZE mm	NIL $R_w(R_w+C_{tr})$	KI 50G11 $R_w(R_w+C_{tr})$
SH60.1B	–/60/60 from both sides	1x25 mm SHAFTLINER MOULDSTOP	1x16 mm MULTISTOP ONE	80	64CH55	39(30)	47(35)
					64CH90	36(27)	44(32)
				118	102CH55	41(32)	48(39)
					102CH90	38(29)	45(36)
SH90.1A	–/90/90 from both sides	1x25 mm SHAFTLINER MOULDSTOP	2x13 mm FIRESTOP	90	64CH55	42(32)	50(40)
					64CH90	39(29)	47(37)
				128	102CH55	44(35)	50(41)
					102CH90	41(32)	47(38)
SH120.2A	–/120/120 from both sides	1x25 mm SHAFTLINER MOULDSTOP	1x16 mm FIRESTOP + 1x13 mm FIRESTOP	93	64CH55	42(33)	50(40)
					64CH90	39(30)	47(37)
				131	102CH55	44(35)	51(42)
					102CH90	41(32)	48(39)
SH120.3A	–/120/120 from both sides	1x25 mm SHAFTLINER MOULDSTOP	2x16 mm FIRESTOP	96	64CH55	43(34)	50(40)
					64CH90	40(31)	47(37)
				134	102CH55	45(36)	51(42)
					102CH90	42(33)	48(39)
SH120.4A	–/120/120 from both sides	1x25 mm SHAFTLINER MOULDSTOP + 1x16 mm FIRESTOP	1x16 mm FIRESTOP	96	64CH55	42(33)	51(40)
					64CH90	39(30)	48(37)
				134	102CH55	45(36)	52(42)
					102CH90	42(33)	49(39)

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

MAX WALL HEIGHTS mm

SYSTEM	STUD SIZE mm	BASE METAL THICKNESS mm	SERVICEABILITY PRESSURE kPa 0.25	0.35
SH60.1B SH90.1A SH120.2A SH120.4A	64	0.55	2950 d	2640 d
		0.90	3460 d	3090 d
	102	0.55	3730 h	2660 h
		0.90	4980 d	4190 h
SH120.3A	64	0.55	3730 h	2660 h
		0.90	4380 d	3890 d
	102	0.55	3730 h	2660 h
		0.90	5510 d	4190 h

Height Limiting Factor: d - deflection (L/240 ≤ 20 mm), **h** – head track capacity

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.

SERVICES SHAFTS – VENTSHAFT

VS

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FC16109

SYSTEM DESCRIPTION

Side 1:
Multiple layers of fire resistant plasterboard screw laminated together

Side 2 (if specified):
- 10 mm SHEETROCK ONE
- timber or steel framing
- 20 mm gap between framing and laminated panel
- Cavity insulation (refer to table).

ACOUSTIC RATINGS BASIS: RT&A TE405-20S10, TK778-06S01

SYSTEM	FRL	SIDE 1	SIDE 2	CAVITY mm	STUD SIZE (Gap) mm	NOM WALL WIDTH mm	INSULATION*	$R_w(R_w+C_{tr})$
VS90.1A	–/90/90 from both sides	3x13 mm FIRESTOP screw laminated together	NA	NA	NA	39	NA	38(37)
VS120.1A	–/120/120 from both sides	3x16 mm FIRESTOP screw laminated together	NA	NA	NA	48	NA	39(38)
VS120.2A	–/120/120 from both sides	1x16 mm FIRESTOP screw laminated to each side of 1x25 mm SHAFTLINER MOULDSTOP	NA	NA	NA	57	NA	39(38)
VST120.1A	–/120/120 from both sides	3x16 mm FIRESTOP screw laminated together	1x10 mm SHEETROCK ONE on free-standing 70 mm timber stud	90	70(20)	148	Nil	46(40)
							KI 50G11	52(44)
VSS120.1A	–/120/120 from both sides	3x16 mm FIRESTOP screw laminated together	1x10 mm SHEETROCK ONE on free-standing 64 mm steel stud	85	64(20)	142	Nil	46(40)
							KI 50G11	52(44)

* KI 50G11 - 50 mm glasswool insulation 11 kg/m^3 density

MAX SIZES OF NON LOAD BEARING VENTSHAFT (VS120.1A, VS120.2A. VST120.1A & VSS120.1A)

SERVICEABILITY PRESSURE			
0.25 kPa		0.35 kPa	
WIDTH mm	HEIGHT mm	WIDTH mm	HEIGHT mm
1200	6000	1200	6000
1800	4800	1800	2800
2400	3300	2400	2100
3000	2700	3000	1700

Height Limiting Factor: L/240 ≤ 20 mm

Notes:
- All four edges of the panel must be supported
- Plasterboard layers 1 and 3 to be aligned along long direction of panel, layer 2 across
- Wall heights tabled are not for axial loads but include self weight and lateral pressures stated
- The maximum panel sizes are based on testing performed using Knauf FireStop plasterboard
- Deflection heads to be designed and used as required
- Panel size of up to 3000 mm x 3000 mm have been fire tested at pressures of 50 Pa. However, the panel size will in most cases be limited by cold structural considerations

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.

CROSS LAMINATED TIMBER (CLT)

CLTB120.1

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01

SYSTEM DESCRIPTION

Side 1:
Refer to table
CLT:
Refer to table
Side 2:
Refer to table

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	122-142	142-162	162-182	187-207
			CLT THICKNESS mm	90	110	130	155
			INSULATION	$R_w(R_w+C_{tr})$			
CLTB120.1A	1x16 mm FIRESTOP	1x16 mm FIRESTOP	Nil	37(34)	38(35)	38(36)	40(37)
CLTB120.1B	1x16 mm MULTISTOP ONE	1x16 mm MULTISTOP ONE	Nil	37(34)	38(35)	38(36)	40(37)
CLTB120.1D	2x13 mm FIRESTOP	2x13 mm FIRESTOP	Nil	38(35)	39(36)	40(37)	41(38)
CLTB120.1E	2x13 mm MULTISTOP ONE	2x13 mm MULTISTOP ONE	Nil	39(36)	40(37)	40(37)	41(38)

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
R-values of systems in the range of R1.1-R1.73. For specific R-values, refer to eSelector.

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.

CROSS LAMINATED TIMBER (CLT)

CLTB120.2

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01

SYSTEM DESCRIPTION

CLT (Refer to table):
16 mm fire resistant plasterboard direct fix to both sides

Side 2:
- 1x13 mm or 2x13 mm or 1x16 mm pbd
- 45 mm cavity using 28 mm furring channel + Betafix clips
- Insulation (refer to table)

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	LINING DIRECT FIX TO BOTH SIDES OF CLT	LINING SIDE 2	NOM WALL WIDTH mm	180-193	200-213	220-233	245-258
			CLT THICKNESS mm	90	110	130	155
			INSULATION*	$R_w(R_w+C_{tr})$			
CLTB120.2A	1x16 mm FIRESTOP	1x13 mm SHEETROCK ONE	Nil	39(34)	40(34)	40(35)	41(35)
			KI 50G11	51(42)	52(43)	52(44)	53(45)
CLTB120.2B	1x16 mm FIRESTOP	1x13 mm WETSTOP	Nil	39(34)	40(34)	40(35)	41(35)
			KI 50G11	51(42)	52(43)	52(44)	53(45)
CLTB120.2C	1x16 mm FIRESTOP	1x13 mm FIRESTOP	Nil	40(35)	41(36)	41(36)	42(37)
			KI 50G11	51(43)	53(44)	54(45)	54(46)
CLTB120.2D	1x16 mm FIRESTOP	1x13 mm IMPACTSTOP	Nil	41(36)	42(36)	42(37)	43(37)
			KI 50G11	53(44)	54(45)	54(46)	55(47)
CLTB120.2E	1x16 mm FIRESTOP	1x13 mm MULTISTOP ONE	Nil	41(36)	42(36)	42(37)	43(37)
			KI 50G11	53(44)	54(45)	54(46)	55(47)
CLTB120.2G	1x16 mm FIRESTOP	1x16 mm FIRESTOP	Nil	42(36)	42(37)	43(37)	43(38)
			KI 50G11	54(45)	54(46)	55(47)	56(47)
CLTB120.2H	1x16 mm FIRESTOP	2x13 mm FIRESTOP	Nil	44(39)	45(40)	45(40)	46(41)
			KI 50G11	57(48)	57(49)	58(50)	59(51)
CLTB120.2J	1x16 mm FIRESTOP	2x13 mm IMPACTSTOP	Nil	45(40)	45(40)	46(41)	46(41)
			KI 50G11	57(49)	58(50)	59(50)	59(51)

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 50G11 - 50 mm glasswool insulation 11 kg/m³ density
R-values > R1.8 for all systems with insulation. For specific R-values, refer to eSelector.

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.

CROSS LAMINATED TIMBER (CLT)

CLTB120.3

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01

SYSTEM DESCRIPTION

Side 1:
- 1x13 mm or 1x16 mm pbd
- 45 mm cavity using 28 mm furring channel + Betafix clips
- Insulation (refer to table)

CLT (Refer to table):
16 mm fire resistant plasterboard direct fix to both sides

Side 2:
- 1x13 mm or 1x16 mm pbd
- 45 mm cavity using 28 mm furring channel + Betafix clips
- Insulation (refer to table)

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	LINING SIDE 1	LINING DIRECT FIX TO BOTH SIDES OF CLT	LINING SIDE 2	NOM WALL WIDTH mm	238-244	258-264	278-284	303-309
				CLT THICKNESS mm	90	110	130	155
				INSULATION*	$R_W(R_W+C_{tr})$			
CLTB120.3A	1x13 mm SHEETROCK ONE	1x16 mm FIRESTOP	1x13 mm SHEETROCK ONE	KI 50G11 one side	47(34)	48(35)	48(36)	49(37)
				KI 50G11 both sides	54(38)	55(39)	55(40)	56(41)
CLTB120.3B	1x13 mm SHEETROCK ONE	1x16 mm FIRESTOP	1x13 mm WETSTOP	KI 50G11 one side	47(34)	48(35)	48(36)	49(37)
				KI 50G11 both sides	54(38)	55(39)	55(40)	56(41)
CLTB120.3C	1x13 mm WETSTOP	1x16 mm FIRESTOP	1x13 mm WETSTOP	KI 50G11 one side	47(34)	48(35)	48(36)	49(37)
				KI 50G11 both sides	54(38)	55(39)	55(40)	56(41)
CLTB120.3D	1x13 mm FIRESTOP	1x16 mm FIRESTOP	1x13 mm FIRESTOP	KI 50G11 one side	49(37)	50(38)	51(39)	52(40)
				KI 50G11 both sides	57(41)	57(42)	58(43)	59(44)
CLTB120.3H	1x13 mm MULTISTOP ONE	1x16 mm FIRESTOP	1x13 mm MULTISTOP ONE	KI 50G11 one side	51(39)	52(40)	53(41)	53(42)
				KI 50G11 both sides	58(43)	59(44)	60(45)	60(46)
CLTB120.3K	1x16 mm FIRESTOP	1x16 mm FIRESTOP	1x16 mm FIRESTOP	KI 50G11 both sides	-	-	-	63(50)
CLTB120.3L	1x13 mm IMPACTSTOP	1x16 mm FIRESTOP	1x13 mm IMPACTSTOP	KI 50G11 one side	51(39)	52(40)	53(41)	53(42)
				KI 50G11 both sides	58(43)	59(44)	60(45)	60(46)

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 50G11 - 50 mm glasswool insulation 11 kg/m^3 density
R-values of systems in the range of R2.44-R4.07 For specific R-values, refer to **eSelector.**

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.

CROSS LAMINATED TIMBER (CLT)

CLTB120.4

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01

SYSTEM DESCRIPTION

CLT (Refer to table):
1x16 mm fire resistant pbd direct fix to both sides

Side 2:
- 1x13 mm or 2x13 mm or 1x16 mm pbd
- 64 mm Rondo steel studs
- 20 mm gap to steel frame
- Insulation (refer to table)

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	LINING DIRECT FIX TO BOTH SIDES OF CLT	LINING SIDE 2	NOM WALL WIDTH mm	219-232	239-252	259-272	284-297
			CLT THICKNESS mm	90	110	130	155
			INSULATION*	$R_W(R_W+C_{tr})$			
CLTB120.4A	1x16 mm FIRESTOP	1x13 mm SHEETROCK ONE	Nil	50(41)	51(42)	52(43)	52(44)
			KI 75G11	57(47)	58(48)	59(49)	60(50)
CLTB120.4B	1x16 mm FIRESTOP	1x13 mm WETSTOP	Nil	50(41)	51(42)	52(43)	52(44)
			KI 75G11	57(47)	58(48)	59(49)	60(50)
CLTB120.4C	1x16 mm FIRESTOP	1x13 mm FIRESTOP	Nil	51(43)	52(44)	52(44)	53(45)
			KI 75G11	58(48)	59(49)	59(50)	61(51)
CLTB120.4D	1x16 mm FIRESTOP	1x13 mm IMPACTSTOP	Nil	52(43)	52(44)	53(45)	54(46)
			KI 75G11	59(49)	59(50)	60(51)	61(52)
			KI 90G11	59(50)	-	-	-
CLTB120.4E	1x16 mm FIRESTOP	1x13 mm MULTISTOP ONE	Nil	52(43)	52(44)	53(45)	54(46)
			KI 75G11	59(49)	59(50)	60(51)	61(52)
			KI 90G11	59(50)	-	-	-
CLTB120.4G	1x16 mm FIRESTOP	1x16 mm FIRESTOP	KI 75G11	59(50)	60(51)	60(51)	61(52)
CLTB120.4H	1x16 mm FIRESTOP	2x13 mm SHEETROCK ONE	Nil	53(45)	54(46)	54(47)	55(48)
			KI 75G11	60(51)	60(52)	61(53)	62(54)
CLTB120.4I	1x16 mm FIRESTOP	2x13 mm WETSTOP	Nil	53(45)	54(46)	54(47)	55(48)
			KI 75G11	60(51)	60(52)	61(53)	62(54)
CLTB120.4J	1x16 mm FIRESTOP	2x13 mm FIRESTOP	Nil	54(47)	54(48)	55(48)	56(49)
			KI 75G11	60(52)	61(53)	62(54)	63(55)
CLTB120.4L	1x16 mm FIRESTOP	2x13 mm MULTISTOP ONE	Nil	54(47)	55(48)	55(49)	56(50)
			KI 75G11	60(53)	61(54)	62(55)	63(56)
CLTB120.4N	1x16 mm FIRESTOP	2x13 mm IMPACTSTOP	Nil	54(47)	55(48)	55(49)	56(50)
			KI 75G11	60(53)	61(54)	62(55)	63(56)

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 50G11 - 50 mm glasswool insulation 11 kg/m³ density
KI 75G11 - 75 mm glasswool insulation 11 kg/m³ density
KI 90G11 - 90 mm glasswool insulation 11 kg/m³ density
R-values > R3.03 for all systems with insulation. For specific R-values, refer to **eSelector.**

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.

CROSS LAMINATED TIMBER (CLT)

CLTB120.5

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01

SYSTEM DESCRIPTION

Side 1:
- 1x13 mm or 1x16 mm pbd
- 45 mm cavity using 28 mm furring channel + Betafix clips
- Insulation (refer to table)

CLT (Refer to table):
1x16 mm fire resistant plasterboard direct fix to both sides

Side 2:
- 1x13 mm or 1x16 mm pbd
- 64 mm Rondo steel studs
- 20 mm gap to steel framing
- Insulation (refer to table)

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	LINING SIDE 1	LINING DIRECT FIX TO BOTH SIDES OF CLT	LINING SIDE 2	NOM WALL WIDTH mm	277-283	297-303	317-323	342-348
				CLT THICKNESS mm	90	110	130	155
				INSULATION*	$R_w(R_w+C_{tr})$			
CLTB120.5A	1x13 mm SHEETROCK ONE	1x16 mm FIRESTOP	1x13 mm SHEETROCK ONE	KI 75G11 (stud only)	55(42)	56(43)	57(44)	58(45)
				KI 75G11 (stud) + KI 50G11 (furring channel)	62(45)	63(46)	64(47)	64(48)
CLTB120.5B	1x13 mm SHEETROCK ONE	1x16 mm FIRESTOP	1x13 mm WETSTOP	KI 75G11 (stud only)	55(42)	56(43)	57(44)	58(45)
				KI 75G11 (stud) + KI 50G11 (furring channel)	62(45)	63(46)	64(47)	64(48)
CLTB120.5C	1x13 mm WETSTOP	1x16 mm FIRESTOP	1x13 mm SHEETROCK ONE	KI 75G11 (stud only)	55(42)	56(43)	57(44)	58(45)
				KI 75G11 (stud) + KI 50G11 (furring channel)	62(45)	63(46)	64(47)	64(48)
CLTB120.5D	1x13 mm WETSTOP	1x16 mm FIRESTOP	1x13 mm WETSTOP	KI 75G11 (stud only)	55(42)	56(43)	57(44)	58(45)
				KI 75G11 (stud) + KI 50G11 (furring channel)	62(45)	63(46)	64(47)	64(48)
CLTB120.5G	1x13 mm FIRESTOP	1x16 mm FIRESTOP	1x13 mm FIRESTOP	KI 75G11 (stud only)	57(45)	58(46)	59(47)	60(48)
				KI 75G11 (stud) + KI 50G11 (furring channel)	64(48)	65(49)	66(50)	67(51)
CLTB120.5L	1x13 mm MULTISTOP ONE	1x16 mm FIRESTOP	1x13 mm MULTISTOP ONE	KI 75G11 (stud only)	60(47)	60(48)	61(49)	62(50)
				KI 75G11 (stud) + KI 50G11 (furring channel)	65(50)	66(51)	67(52)	68(53)
CLTB120.5O	1x16 mm FIRESTOP	1x16 mm FIRESTOP	1x16 mm FIRESTOP	KI 75G11 (stud only)	60(48)	61(49)	61(50)	62(51)
				KI 75G11 (stud) + KI 50G11 (furring channel)	66(52)	67(53)	68(54)	69(55)
CLTB120.5P	1x13 mm IMPACTSTOP	1x16 mm FIRESTOP	1x13 mm IMPACTSTOP	KI 75G11 (stud only)	60(47)	60(48)	61(49)	62(50)
				KI 75G11 (stud) + KI 50G11 (furring channel)	65(50)	66(51)	67(52)	68(53)

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 50G11 - 50 mm glasswool insulation 11 kg/m³ density
KI 75G11 - 75 mm glasswool insulation 11 kg/m³ density
R-values of systems in the range of R4.11-R5.41. For specific R-values, refer to **eSelector.**

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.

CROSS LAMINATED TIMBER (CLT)

CLTB120.6

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01

SYSTEM DESCRIPTION

Side 1:
- 1x13 mm or 1x16 mm pbd
- 64 mm Rondo steel studs
- 20 mm gap to steel framing
- Insulation (refer to table)

CLT (Refer to table):
1x16 mm fire resistant plasterboard direct fix to both sides

Side 2:
- 1x13 mm or 1x16 mm pbd
- 64 mm Rondo steel studs
- 20 mm gap to steel framing
- Insulation (refer to table)

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	LINING SIDE 1	LINING DIRECT FIX TO BOTH SIDES OF CLT	LINING SIDE 2	NOM WALL WIDTH mm	316-322	336-342	356-362	381-387
				CLT THICKNESS mm	90	110	130	155
				INSULATION*	$R_W(R_W+C_{tr})$			
CLTB120.6A	1x13 mm SHEETROCK ONE	1x16 mm FIRESTOP	1x13 mm SHEETROCK ONE	KI 50G11 one side	57(46)	58(47)	58(48)	59(49)
				KI 75G11 one side	58(47)	58(48)	59(49)	60(49)
				KI 50G11 both sides	63(48)	64(50)	65(51)	66(52)
				KI 75G11 both sides	64(50)	65(51)	66(52)	67(53)
				KI 90G11 both sides	65(51)	66(52)	66(53)	67(54)
CLTB120.6C	1x13 mm WETSTOP	1x16 mm FIRESTOP	1x13 mm WETSTOP	KI 50G11 one side	57(46)	58(47)	58(48)	59(49)
				KI 75G11 one side	58(47)	58(48)	59(49)	60(49)
				KI 50G11 both sides	63(48)	64(50)	65(51)	66(52)
				KI 75G11 both sides	64(50)	65(51)	66(52)	67(53)
				KI 90G11 both sides	65(51)	66(52)	66(53)	67(54)
CLTB120.6D	1x13 mm FIRESTOP	1x16 mm FIRESTOP	1x13 mm FIRESTOP	KI 50G11 one side	60(49)	60(50)	61(51)	62(52)
				KI 75G11 one side	60(50)	61(51)	62(52)	62(52)
				KI 50G11 both sides	66(52)	67(53)	67(54)	68(55)
				KI 75G11 both sides	67(53)	68(54)	69(55)	69(56)
				KI 90G11 both sides	67(54)	68(55)	69(56)	70(57)
CLTB120.6H	1x13 mm MULTISTOP ONE	1x16 mm FIRESTOP	1x13 mm MULTISTOP ONE	KI 50G11 one side	61(51)	62(52)	63(53)	63(54)
				KI 75G11 one side	62(51)	62(52)	63(53)	64(54)
				KI 50G11 both sides	67(54)	68(55)	69(56)	70(57)
				KI 75G11 both sides	68(55)	69(56)	70(57)	71(58)
				KI 90G11 both sides	69(56)	69(57)	70(58)	71(59)
CLTB120.6K	1x16 mm FIRESTOP	1x16 mm FIRESTOP	1x16 mm FIRESTOP	KI 50G11 one side	62(52)	63(53)	64(54)	64(55)
				KI 75G11 one side	63(53)	64(54)	64(55)	65(56)
				KI 50G11 both sides	68(55)	69(56)	70(57)	71(58)
				KI 75G11 both sides	69(57)	70(58)	71(59)	72(60)
				KI 90G11 both sides	69(57)	70(58)	71(59)	72(60)
CLTB120.6L	1x13 mm IMPACTSTOP	1x16 mm FIRESTOP	1x13 mm IMPACTSTOP	KI 50G11 one side	61(51)	62(52)	63(53)	63(54)
				KI 75G11 one side	62(51)	62(52)	63(53)	64(54)
				KI 50G11 both sides	67(54)	68(55)	69(56)	70(57)
				KI 75G11 both sides	68(55)	69(56)	70(57)	71(58)
				KI 90G11 both sides	69(56)	69(57)	70(58)	71(59)

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 50G11 - 50 mm glasswool insulation 11 kg/m³ density
KI 75G11 - 75 mm glasswool insulation 11 kg/m³ density
KI 90G11 - 90 mm glasswool insulation 11 kg/m³ density
R-values of systems in the range of R4.11-R5.41. For specific R-values, refer to **eSelector.**

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.

CROSS LAMINATED TIMBER (CLT)

CLTT120.1

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01

SYSTEM DESCRIPTION

Side 1:
1x16 mm fire resistant pbd
CLT (Refer to table):
Refer to table
Insulation:
Refer to table
Gap:
20 mm air gap
CLT:
Refer to table
Side 2:
1x16 mm fire resistant pbd

ACOUSTIC OPINION: PKA103KNF — **THERMAL BASIS:** JMF REPORT 274F

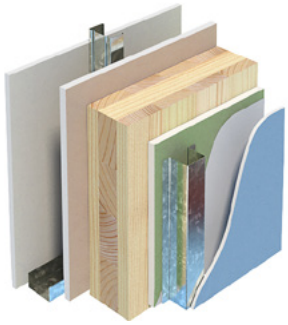
SYSTEM	LINING SIDE 1	LINING SIDE 2	NOM WALL WIDTH mm	232	272	312	362
			CLT THICKNESS mm	90	110	130	155
			INSULATION*	$R_w(R_w+C_{tr})$			
CLTT120.1A	1x16 mm FIRESTOP	1x16 mm FIRESTOP	Nil	55(42)	56(43)	57(44)	58(45)
			KI 50G11	62(45)	63(46)	64(47)	64(48)
CLTT120.1B	1x16 mm MULTISTOP ONE	1x16 mm MULTISTOP ONE	Nil	55(42)	56(43)	57(44)	58(45)
			KI 50G11	62(45)	63(46)	64(47)	64(48)

* KI 50G11 - 50 mm glasswool insulation 11 kg/m³ density
R-values of systems in the range of R4.11-R5.41. For specific R-values, refer to eSelector.

CLTE120.1

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01



SYSTEM DESCRIPTION

Side 1:
- 1x13 mm plasterboard
- 64 mm Rondo steel studs
- 25 mm gap to steel framing
- Insulation (refer to table)

CLT (Refer to table):
1x16 mm FIRESTOP direct fix to internal face, 1x16 mm MULTISTOP ONE direct fix to external face
External:
- Nil insulation - Vapour Barrier Only
- 45 mm gap using Steel Top Hat

External Cladding:
9 mm fibre cement

ACOUSTIC OPINION: PKA103KNF — **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	LINING SIDE 1	LINING DIRECT FIX TO SIDE 1 OF CLT	LINING DIRECT FIX TO EXTERNAL SIDE OF CLT	NOM WALL WIDTH mm	278	298	318	343
				CLT THICKNESS mm	90	110	130	155
				INSULATION*	$R_w(R_w+C_{tr})$			
CLTE120.1A	1x13 mm SHEETROCK ONE	1x16 mm FIRESTOP	1x16 mm MULTISTOP ONE	KI 90G R2.5 (stud)	60(47)	61(48)	61(49)	62(50)
CLTE120.1B	1x13 mm WETSTOP	1x16 mm FIRESTOP	1x16 mm MULTISTOP ONE	KI 90G R2.5 (stud)	60(47)	61(48)	61(49)	62(50)
CLTE120.1C	1x13 mm FIRESTOP	1x16 mm FIRESTOP	1x16 mm MULTISTOP ONE	KI 90G R2.5 (stud)	61(49)	62(50)	63(51)	63(52)
CLTE120.1E	1x13 mm MULTISTOP ONE	1x16 mm FIRESTOP	1x16 mm MULTISTOP ONE	KI 90G R2.5 (stud)	62(50)	63(51)	63(52)	64(53)
CLTE120.1F	1x13 mm IMPACTSTOP	1x16 mm FIRESTOP	1x16 mm MULTISTOP ONE	KI 90G R2.5 (stud)	62(50)	63(51)	63(52)	64(53)

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 90G R2.5 - 50 mm glasswool insulation 11 kg/m³ density
R-values of systems in the range of R4.11-R5.41. For specific R-values, refer to eSelector.

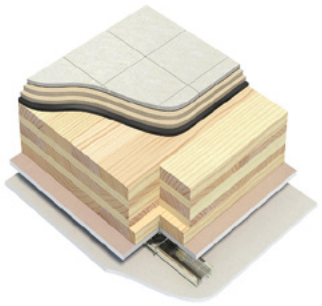
For the full range of Knauf systems refer to **knauf.com/en-AU/knauf-gypsum/services/tools/eselector**
Blue text indicates systems and products suitable for wet areas.

CROSS LAMINATED TIMBER (CLT)

CLTC120.11

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01



SYSTEM DESCRIPTION

Floor Finish:
Min 10 mm Ceramic floor Tiles on 8 mm adhesive bed
Floor Covering:
2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat
CLT:
1x16 mm fire resistant pbd direct fix to underside of CLT
Insulation: Refer to table
Ceiling Fixing:
28 mm furring channel + Betafix Clip
Lining Side 2:
1x13 mm or 2x13 mm pbd

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	FLOORING COVERING	LINING SIDE 2	CEILING CAVITY mm	CLT SIZE mm / INSULATION*	140 $R_w(R_w+C_{tr})$ $L_{n,w}$	170 $R_w(R_w+C_{tr})$ $L_{n,w}$	200 $R_w(R_w+C_{tr})$ $L_{n,w}$
CLTC120.11A	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm SHEETROCK ONE	50	Nil	51(43) 68	52(44) 67	53(45) 65
				KI 50G11	56(47) 61	57(48) 60	58(50) 58
CLTC120.11B	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm WETSTOP	50	Nil	51(43) 68	52(44) 67	53(45) 65
				KI 50G11	56(47) 61	57(48) 60	58(50) 58
CLTC120.11C	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm FIRESTOP	50	Nil	51(44) 67	52(45) 65	53(46) 64
				KI 50G11	56(48) 60	57(49) 58	58(50) 57
CLTC120.11D	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm IMPACTSTOP	50	Nil	51(44) 66	52(45) 65	53(46) 63
				KI 50G11	56(48) 59	57(49) 58	58(51) 56
CLTC120.11E	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm MULTISTOP ONE	50	Nil	51(44) 66	52(45) 65	53(46) 63
				KI 50G11	56(48) 59	57(49) 58	58(51) 56
CLTC120.11F	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	2x13 mm SHEETROCK ONE	50	Nil	52(45) 64	53(46) 63	54(47) 61
				KI 50G11	57(49) 57	58(50) 56	59(52) 54
CLTC120.11G	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	2x13 mm FIRESTOP	50	Nil	52(45) 63	53(46) 62	54(47) 60
				KI 50G11	57(50) 56	58(51) 54	59(52) 53
CLTC120.11H	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	2x13 mm MULTISTOP ONE	50	Nil	52(45) 63	53(46) 61	54(47) 60
				KI 50G11	57(50) 55	59(51) 54	60(52) 52

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 50G11 - 50 mm glasswool insulation 11 kg/m^3 density
R-values of systems in the range of R1.93-R3.52. For specific R-values, refer to eSelector.

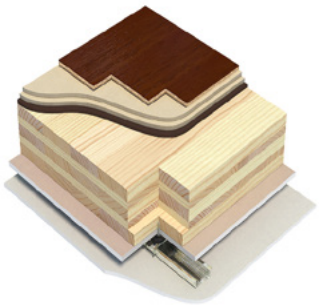
For the full range of Knauf systems refer to **knauf.com/en-AU/knauf-gypsum/services/tools/eselector**
Blue text indicates systems and products suitable for wet areas.

CROSS LAMINATED TIMBER (CLT)

CLTC120.12

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01



SYSTEM DESCRIPTION

Floor Finish:
Min 14 mm Engineered Timber or min 7 mm Laminate Flooring on min 3 mm Underlay

Floor Covering:
2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat

CLT:
1x16 mm fire resistant pbd direct fixed to underside of CLT

Insulation: Refer to table

Ceiling Fixing:
28 mm furring channel + Betafix Clip

Lining Side 2:
1x13 mm or 2x13 mm pbd

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	FLOORING COVERING	LINING SIDE 2	CEILING CAVITY mm	CLT SIZE mm	140	170	200
				INSULATION*	$R_W(R_W+C_{tr})$ $L_{n,w}$	$R_W(R_W+C_{tr})$ $L_{n,w}$	$R_W(R_W+C_{tr})$ $L_{n,w}$
CLTC120.12A	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm SHEETROCK ONE	50	Nil	50(43) 68	52(44) 66	53(45) 65
				KI 50G11	56(46) 61	57(47) 59	58(48) 58
CLTC120.12B	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm WETSTOP	50	Nil	50(43) 68	52(44) 66	53(45) 65
				KI 50G11	56(46) 61	57(47) 59	58(48) 58
CLTC120.12C	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm FIRESTOP	50	Nil	51(43) 66	52(45) 65	53(46) 63
				KI 50G11	56(47) 60	57(48) 58	58(49) 56
CLTC120.12D	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm IMPACTSTOP	50	Nil	51(44) 66	52(45) 64	53(46) 63
				KI 50G11	56(47) 59	57(48) 57	58(49) 56
CLTC120.12E	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm MULTISTOP ONE	50	Nil	51(44) 66	52(45) 64	53(46) 63
				KI 50G11	56(47) 59	57(48) 57	58(49) 56
CLTC120.12F	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	2x13 mm SHEETROCK ONE	50	Nil	52(45) 64	53(46) 62	54(47) 61
				KI 50G11	57(48) 57	58(49) 55	59(51) 54
CLTC120.12G	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	2x13 mm FIRESTOP	50	Nil	52(45) 62	53(46) 61	54(47) 59
				KI 50G11	57(49) 56	58(50) 54	59(51) 52
CLTC120.12H	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	2x13 mm MULTISTOP ONE	50	Nil	52(45) 62	53(46) 60	54(47) 59
				KI 50G11	57(49) 55	58(50) 53	59(52) 52

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 50G11 - 50 mm glasswool insulation 11 kg/m^3 density
R-values of systems in the range of R2.13-R3.59. For specific R-values, refer to eSelector.

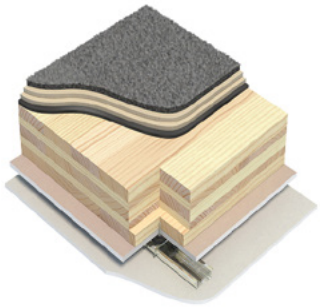
For the full range of Knauf systems refer to **knauf.com/en-AU/knauf-gypsum/services/tools/eselector**
Blue text indicates systems and products suitable for wet areas.

CROSS LAMINATED TIMBER (CLT)

CLTC120.13

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01



SYSTEM DESCRIPTION

Floor Finish:
Min 12 mm Carpet on 8 mm Chipfoam Underlay
Floor Covering:
2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat
CLT:
1x16 mm fire resistant pbd direct fixed to underside of CLT
Insulation: Refer to table
Ceiling Fixing:
28 mm furring channel + Betafix Clip
Lining Side 2:
1x13 mm or 2x13 mm pbd

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	FLOORING COVERING	LINING SIDE 2	CEILING CAVITY mm	CLT SIZE mm	140	170	200
				INSULATION*	$R_W(R_W+C_{tr})$ $L_{n,w}$	$R_W(R_W+C_{tr})$ $L_{n,w}$	$R_W(R_W+C_{tr})$ $L_{n,w}$
CLTC120.13A	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm SHEETROCK ONE	50	Nil	50(43) 38	51(44) 37	52(45) 35
				KI 50G11	55(46) 32	57(47) 30	57(48) 29
CLTC120.13B	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm WETSTOP	50	Nil	50(43) 38	51(44) 37	52(45) 35
				KI 50G11	55(46) 32	57(47) 30	57(48) 29
CLTC120.13C	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm FIRESTOP	50	Nil	51(43) 37	52(44) 36	53(45) 34
				KI 50G11	56(46) 31	57(48) 29	58(49) 27
CLTC120.13D	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm IMPACTSTOP	50	Nil	51(43) 37	52(44) 35	53(45) 33
				KI 50G11	56(47) 30	57(48) 28	58(49) 27
CLTC120.13E	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x13 mm MULTISTOP ONE	50	Nil	51(43) 37	52(44) 35	53(45) 33
				KI 50G11	56(47) 30	57(48) 28	58(49) 27
CLTC120.13F	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	2x13 mm SHEETROCK ONE	50	Nil	51(44) 35	52(45) 33	53(46) 32
				KI 50G11	56(48) 28	58(49) 26	59(50) 24
CLTC120.13G	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	2x13 mm FIRESTOP	50	Nil	52(45) 34	53(46) 32	54(47) 31
				KI 50G11	57(48) 27	58(50) 25	59(51) 23
CLTC120.13H	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	2x13 mm MULTISTOP ONE	50	Nil	52(45) 33	53(46) 32	54(47) 30
				KI 50G11	57(49) 26	59(50) 24	59(51) 23

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 50G11 - 50 mm glasswool insulation 11 kg/m³ density
KI 75G11 - 75 mm glasswool insulation 11 kg/m³ density
KI 90G11 - 90 mm glasswool insulation 11 kg/m³ density
R-values of systems in the range of R1.95-R3.54. For specific R-values, refer to eSelector.

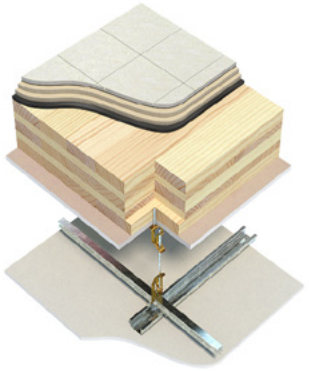
For the full range of Knauf systems refer to **knauf.com/en-AU/knauf-gypsum/services/tools/eselector**
Blue text indicates systems and products suitable for wet areas.

CROSS LAMINATED TIMBER (CLT)

CLTC120.21

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01



SYSTEM DESCRIPTION

Floor Finish:
Min 10 mm Ceramic floor Tiles on 8 mm adhesive bed

Floor Covering:
2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat

CLT:
1x16 mm fire resistant pbd direct fixed to underside of CLT

Insulation: Refer to table

Ceiling Fixing:
Rondo suspension system/Betafix clip with 28m furring channel

Lining Side 2:
1x13 mm or 2x13 mm pbd

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	FLOORING COVERING	LINING DIRECT FIX TO UNDERSIDE OF CLT	LINING SIDE 2	CEILING CAVITY mm	CLT SIZE mm / INSULATION*	140 $R_w (R_w+C_{tr})$ $L_{n,w}$	170 $R_w (R_w+C_{tr})$ $L_{n,w}$	200 $R_w (R_w+C_{tr})$ $L_{n,w}$
CLTC120.21A	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm SHEETROCK ONE	100	Nil	51(44) 62	53(45) 61	54(46) 59
					KI 90G11	57(50) 55	59(51) 53	60(52) 52
				150	Nil	52(45) 61	53(46) 60	54(47) 58
					KI 90G11	58(51) 54	59(52) 52	60(53) 51
				200	Nil	52(45) 61	53(46) 59	54(47) 58
					KI 90G11	58(51) 53	59(53) 52	60(54) 50
CLTC120.21B	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm WETSTOP	100	Nil	51(44) 62	53(45) 61	54(46) 59
					KI 90G11	57(50) 55	59(51) 53	60(52) 52
				150	Nil	52(45) 61	53(46) 60	54(47) 58
					KI 90G11	58(51) 54	59(52) 52	60(53) 51
				200	Nil	52(45) 61	53(46) 59	54(47) 58
					KI 90G11	58(51) 53	59(53) 52	60(54) 50
CLTC120.21C	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm FIRESTOP	100	Nil	52(45) 61	53(46) 59	54(47) 58
					KI 90G11	58(51) 54	59(52) 52	60(53) 51
				150	Nil	52(45) 60	53(46) 59	54(47) 57
					KI 90G11	58(52) 53	60(53) 51	61(54) 50
				200	Nil	52(46) 60	53(47) 58	54(48) 57
					KI 90G11	59(52) 52	60(53) 51	61(54) 49
CLTC120.21D	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm IMPACTSTOP	100	Nil	52(45) 60	54(46) 59	55(47) 57
					KI 90G11	58(51) 53	60(52) 51	61(53) 50
				150	Nil	53(46) 60	54(47) 58	55(48) 57
					KI 90G11	59(52) 52	60(53) 51	61(54) 49
				200	Nil	53(46) 59	54(47) 57	55(48) 56
					KI 90G11	59(53) 52	60(54) 50	61(55) 49
CLTC120.21E	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm MULTISTOP ONE	100	Nil	52(45) 60	54(46) 59	55(47) 57
					KI 90G11	58(51) 53	60(52) 51	61(53) 50
				150	Nil	53(46) 60	54(47) 58	55(48) 57
					KI 90G11	59(52) 52	60(53) 51	61(54) 49
				200	Nil	53(46) 59	54(47) 57	55(48) 56
					KI 90G11	59(53) 52	60(54) 50	61(55) 49
CLTC120.21F	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	2x13 mm SHEETROCK ONE	100	Nil	54(46) 59	55(47) 57	56(48) 56
					KI 90G11	59(52) 51	61(54) 49	62(55) 48
				150	Nil	54(47) 58	55(48) 56	56(49) 55
					KI 90G11	60(53) 50	61(54) 49	62(55) 47
				200	Nil	54(47) 57	55(48) 56	56(49) 54
					KI 90G11	60(54) 50	61(55) 48	62(56) 47

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 90G11 - 90 mm glasswool insulation 11 kg/m^3 density
R-values of systems in the range of R1.85-R4.83. For specific R-values, refer to eSelector.

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.

CROSS LAMINATED TIMBER (CLT)

CLTC120.22

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01

SYSTEM DESCRIPTION

Floor Finish:
Min 14 mm Engineered Timber or min 7 mm Laminate Flooring on min 3 mm Underlay

Floor Covering:
2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat

CLT:
1x16 mm fire resistant pbd direct fixed to underside of CLT

Insulation: Refer to table

Ceiling Fixing:
Rondo suspension system/Betafix clip with 28m furring channel

Lining Side 2:
1x13 mm or 2x13 mm pbd

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	FLOORING COVERING	LINING DIRECT FIX TO UNDERSIDE OF CLT	LINING SIDE 2	CEILING CAVITY mm	CLT SIZE mm	140	170	200
					INSULATION*	$R_w (R_w+C_{tr})$ $L_{n,w}$	$R_w (R_w+C_{tr})$ $L_{n,w}$	$R_w (R_w+C_{tr})$ $L_{n,w}$
CLTC120.22A	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm SHEETROCK ONE	100	Nil	51(44) 61	53(45) 60	54(46) 58
					KI 90G11	57(49) 54	59(50) 52	60(51) 51
				150	Nil	52(45) 60	53(46) 59	54(47) 57
					KI 90G11	58(50) 53	59(51) 51	60(52) 50
				200	Nil	52(45) 60	53(46) 58	54(47) 57
					KI 90G11	58(51) 52	59(52) 51	60(53) 49
CLTC120.22B	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm WETSTOP	100	Nil	51(44) 61	53(45) 60	54(46) 58
					KI 90G11	57(49) 54	59(50) 52	60(51) 51
				150	Nil	52(45) 60	53(46) 59	54(47) 57
					KI 90G11	58(50) 53	59(51) 51	60(52) 50
				200	Nil	52(45) 60	53(46) 58	54(47) 57
					KI 90G11	58(51) 52	59(52) 51	60(53) 49
CLTC120.22C	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm FIRESTOP	100	Nil	52(45) 60	53(46) 58	54(47) 57
					KI 90G11	58(50) 53	59(51) 51	60(52) 50
				150	Nil	52(45) 59	54(47) 58	55(48) 56
					KI 90G11	58(51) 52	60(52) 50	61(53) 49
				200	Nil	53(46) 58	54(47) 57	55(48) 55
					KI 90G11	59(52) 51	60(53) 49	61(54) 48
CLTC120.22D	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm IMPACTSTOP	100	Nil	52(45) 59	54(46) 58	55(47) 56
					KI 90G11	58(50) 52	60(51) 50	61(53) 49
				150	Nil	53(46) 58	54(47) 57	55(48) 55
					KI 90G11	59(51) 51	60(53) 49	61(54) 48
				200	Nil	53(46) 58	54(47) 56	55(48) 55
					KI 90G11	59(52) 50	60(53) 49	61(54) 47
CLTC120.22E	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm MULTISTOP ONE	100	Nil	52(45) 59	54(46) 58	55(47) 56
					KI 90G11	58(50) 52	60(51) 50	61(53) 49
				150	Nil	53(46) 58	54(47) 57	55(48) 55
					KI 90G11	59(51) 51	60(53) 49	61(54) 48
				200	Nil	53(46) 58	54(47) 56	55(48) 55
					KI 90G11	59(52) 50	60(53) 49	61(54) 47
CLTC120.22F	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	2x13 mm SHEETROCK ONE	100	Nil	54(46) 57	55(47) 56	56(48) 54
					KI 90G11	59(51) 50	61(53) 48	62(54) 47
				150	Nil	54(47) 56	55(48) 55	56(49) 53
					KI 90G11	60(53) 49	61(54) 47	62(55) 46
				200	Nil	54(47) 56	55(48) 54	56(49) 53
					KI 90G11	60(53) 48	61(54) 47	62(56) 45

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 90G11 - 90 mm glasswool insulation 11 kg/m^3 density
R-values of systems in the range of R1.92-R4.90. For specific R-values, refer to eSelector.

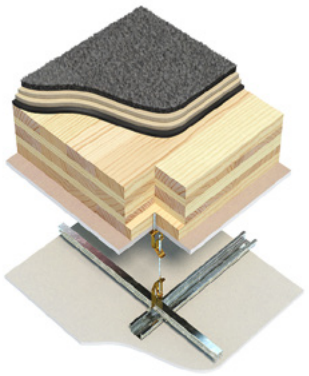
For the full range of Knauf systems refer to **knauf.com/en-AU/knauf-gypsum/services/tools/eselector**
Blue text indicates systems and products suitable for wet areas.

CROSS LAMINATED TIMBER (CLT)

CLTC120.23

FIRE RESISTANCE LEVEL
FRL **120/120/120**
FROM BOTH SIDES

FRL Basis: FC17317-01



SYSTEM DESCRIPTION

Floor Finish:
Min 12 mm Carpet on 8 mm Chipfoam Underlay
Floor Covering:
2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat
CLT:
1x16 mm fire resistant pbd direct fixed to underside of CLT
Insulation: Refer to table
Ceiling Fixing:
Rondo suspension system/Betafix clip with 28m furring channel
Lining Side 2:
1x13 mm or 2x13 mm pbd

ACOUSTIC OPINION: PKA103KNF **THERMAL BASIS:** JMF REPORT 274F

SYSTEM	FLOORING COVERING	LINING DIRECT FIX TO UNDERSIDE OF CLT	LINING SIDE 2	CEILING CAVITY mm	CLT SIZE mm / INSULATION*	140 $R_W(R_W+C_{tr})$ $L_{n,w}$	170 $R_W(R_W+C_{tr})$ $L_{n,w}$	200 $R_W(R_W+C_{tr})$ $L_{n,w}$
CLTC120.23A	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm SHEETROCK ONE	100	Nil	51(44) 34	52(45) 33	53(46) 31
					KI 90G11	57(49) 26	58(50) 25	59(51) 23
				150	Nil	52(44) 33	53(46) 31	54(47) 30
					KI 90G11	57(50) 25	59(51) 24	60(52) 22
				200	Nil	52(45) 32	53(46) 31	54(47) 29
					KI 90G11	58(51) 24	59(52) 23	60(53) 21
CLTC120.23B	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm WETSTOP	100	Nil	51(44) 34	52(45) 33	53(46) 31
					KI 90G11	57(49) 26	58(50) 25	59(51) 23
				150	Nil	52(44) 33	53(46) 31	54(47) 30
					KI 90G11	57(50) 25	59(51) 24	60(52) 22
				200	Nil	52(45) 32	53(46) 31	54(47) 29
					KI 90G11	58(51) 24	59(52) 23	60(53) 21
CLTC120.23C	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm FIRESTOP	100	Nil	52(45) 33	53(46) 31	54(47) 30
					KI 90G11	58(50) 25	59(51) 23	60(52) 22
				150	Nil	52(45) 32	53(46) 30	54(47) 29
					KI 90G11	58(51) 24	59(52) 22	60(53) 21
				200	Nil	52(46) 31	53(47) 29	54(48) 28
					KI 90G11	58(52) 23	60(53) 21	61(54) 20
CLTC120.23D	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm IMPACTSTOP	100	Nil	52(45) 32	53(46) 31	54(47) 29
					KI 90G11	58(50) 24	59(51) 23	60(53) 21
				150	Nil	53(46) 31	54(47) 29	55(48) 28
					KI 90G11	58(51) 23	60(53) 22	61(54) 20
				200	Nil	53(46) 30	54(47) 29	55(48) 27
					KI 90G11	59(52) 22	60(53) 21	61(54) 19
CLTC120.23E	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	1x13 mm MULTISTOP ONE	100	Nil	52(45) 32	53(46) 31	54(47) 29
					KI 90G11	58(50) 24	59(51) 23	60(53) 21
				150	Nil	53(46) 31	54(47) 29	55(48) 28
					KI 90G11	58(51) 23	60(53) 22	61(54) 20
				200	Nil	53(46) 30	54(47) 29	55(48) 27
					KI 90G11	59(52) 22	60(53) 21	61(54) 19
CLTC120.23F	2x13 mm FIBEROCK AQUA-TOUGH on 10 mm Embelton Impactamat	1x16 mm FIRESTOP	2x13 mm SHEETROCK ONE	100	Nil	53(46) 30	54(47) 29	55(48) 27
					KI 90G11	59(52) 22	60(53) 20	62(54) 19
				150	Nil	54(47) 29	55(48) 27	56(49) 26
					KI 90G11	59(53) 21	61(54) 19	62(55) 18
				200	Nil	54(47) 28	55(48) 26	56(49) 25
					KI 90G11	60(53) 20	61(54) 18	62(55) 17

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness
* KI 90G11 - 90 mm glasswool insulation 11 kg/m^3 density
R-values of systems in the range of R1.87-R4.85. For specific R-values, refer to eSelector.

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.

COLUMN PROTECTION

PCC.1

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FC16195

SYSTEM DESCRIPTION

One or more layers of fire resistant pbd direct fixed or furred with Rondo 308 or 333 furring channels (refer to table)

COLUMN PROTECTION - CONCRETE COLUMNS

SYSTEM	FRL	LINING (All Sides)	FIXING
PCC30.1A	+30/–/–	1x13 mm FIRESTOP	Direct or Furred
PCC60.1A	+60/-/-	2x13 mm FIRESTOP	Furred
PCC90.1A	+90/-/-	2x16 mm FIRESTOP	Furred
PCC120.1A	+120/–/–	1x25 mm SHAFTLINER MOULDSTOP	Direct or Furred

PTC.1

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FC16195

SYSTEM DESCRIPTION

One or more layers of fire resistant pbd direct fixed (refer to table)

COLUMN PROTECTION - TIMBER COLUMNS

SYSTEM	FRL	LINING (All Sides)	FIXING
PTC30.1A	30/–/–	1x13 mm FIRESTOP	Direct Fixed
PTC60.1A	60/–/–	2x13 mm FIRESTOP	Direct Fixed
PTC90.1A	90/–/–	3x13 mm FIRESTOP	Direct Fixed
PTC120.1A	120/–/–	3x16 mm FIRESTOP	Direct Fixed

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.

COLUMN PROTECTION

PSC.1

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FC16195

SYSTEM DESCRIPTION

One or more layers of fire resistant pbd around periphery on encasement channel forming gap around column

COLUMN PROTECTION – STEEL I–SECTIONS

SYSTEM	FRL	LINING (All Sides)	FIXING
PSC30.1A	30/–/–	1x13 mm FIRESTOP	Around periphery, spaced from column
PSC60.1A	60/–/–	2x13 mm FIRESTOP	Around periphery, spaced from column
PSC90.1A	90/–/–	2x16 mm FIRESTOP	Around periphery, spaced from column
PSC120.1A	120/–/–	3x13 mm FIRESTOP	Around periphery, spaced from column

PSC.2

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FC16195

SYSTEM DESCRIPTION

One or more layers of fire resistant pbd around periphery on Rondo 142 track forming nom 18 mm gap around column

COLUMN PROTECTION – STEEL SHS/RHS SECTIONS

SYSTEM	FRL	LINING (All Sides)	FIXING
PSC30.2A	30/–/–	1x13 mm FIRESTOP	Around periphery, spaced from column
PSC60.2A	60/–/–	2x13 mm FIRESTOP	Around periphery, spaced from column
PSC90.2A	90/–/–	2x16 mm FIRESTOP	Around periphery, spaced from column
PSC120.2A	120/–/–	3x13 mm FIRESTOP	Around periphery, spaced from column

PSC.3

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FC12535

SYSTEM DESCRIPTION

One or more layers of fire resistant pbd around periphery on Rondo 0.75 mm BMT track forming gap around column

COLUMN PROTECTION – STEEL CHS SECTIONS

SYSTEM	FRL	LINING (All Sides)	FIXING
PSC30.3A	30/–/–	1x13 mm FIRESTOP	Around periphery, spaced from column
PSC60.3A	60/–/–	2x13 mm FIRESTOP	Around periphery, spaced from column
PSC90.3A	90/–/–	2x16 mm FIRESTOP	Around periphery, spaced from column
PSC120.3A	120/–/–	3x13 mm FIRESTOP	Around periphery, spaced from column

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.

COLUMN PROTECTION

PSC.4

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FC16195

SYSTEM DESCRIPTION

One or more layers of fire resistant pbd direct fixed to steel studs encasing column entirely within fire-rated wall

COLUMN PROTECTION – STEEL COLUMNS WITHIN WALL

SYSTEM	FRL	LINING (Both Sides)	FIXING
PSC30.4A	30/–/–	1x13 mm FIRESTOP	Direct to stud in accordance with standard fire-rated installation details
PSC60.4A	60/–/–	1x16 mm FIRESTOP	Direct to stud in accordance with standard fire-rated installation details
PSC90.4A	90/–/–	2x13 mm FIRESTOP	Direct to stud in accordance with standard fire-rated installation details
PSC120.4A	120/–/–	2x16 mm FIRESTOP	Direct to stud in accordance with standard fire-rated installation details

* The structural steel section shall not be in contact with the wall lining.

BEAM PROTECTION

PSB.1

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FC16195

SYSTEM DESCRIPTION

One or more layers of fire resistant pbd around periphery on framing forming gap around beam

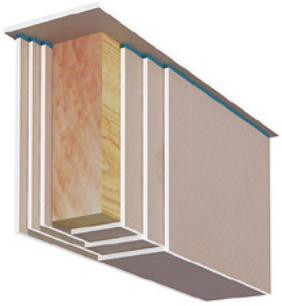
BEAM PROTECTION - STEEL BEAMS

SYSTEM	FRL	LINING (All Sides)	FIXING
PSB30.1A	30/–/–	1x13 mm FIRESTOP	Spaced from sides and bottom of steel beam
PSB60.1A	60/-/-	2x13 mm FIRESTOP	Spaced from sides and bottom of steel beam
PSB90.1A	90/–/–	2x16 mm FIRESTOP	Spaced from sides and bottom of steel beam
PSB120.1A	120/–/–	3x13 mm FIRESTOP	Spaced from sides and bottom of steel beam

PTB.1

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FC16195



SYSTEM DESCRIPTION

One or more layers of fire resistant pbd direct fixed (refer to table)

BEAM PROTECTION - TIMBER BEAMS

SYSTEM	FRL	LINING (All Sides)	FIXING
PTB30.1A	30/–/–	1x13 mm FIRESTOP	Direct Fixed
PTB60.1A	60/–/–	2x13 mm FIRESTOP	Direct Fixed
PTB90.1A	90/–/–	3x13 mm FIRESTOP	Direct Fixed
PTB120.1A	120/–/–	3x16 mm FIRESTOP	Direct Fixed

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.

FIRE TUNNEL

FT

FIRE RESISTANCE LEVEL
(refer to table)

FRL Basis: FC16109

SYSTEM DESCRIPTION

One or more layers of fire resistant pbd direct fixed to both sides of steel framed walls and ceiling.

FIRE TUNNELS

SYSTEM	FRL	FRAME	LINING
FT60.1A	–/60/60 from outside	Welded steel frame ex 150 mm Rondo studs, track and corner angles	1x16 mm FIRESTOP over and under ceiling 1x16 mm FIRESTOP to both sides of wall frame
FT60.2A	–/60/60 from both sides	Welded steel frame ex 150 mm Rondo studs, track and corner angles	2x16 mm FIRESTOP over and under ceiling 1x16 mm FIRESTOP to both sides of wall frame
FT90.1A	–/90/90 from outside	Welded steel frame ex 150 mm Rondo studs, track and corner angles	2x13 mm FIRESTOP over ceiling and outside walls 1x13 mm FIRESTOP under ceiling and inner walls
FT120.1A	–/120/120 from outside	Welded steel frame ex 150 mm Rondo studs, track and corner angles	2x16 mm FIRESTOP over ceiling and outside walls 1x16 mm FIRESTOP + 1x10 mm SHEETROCK ONE under ceiling and inner walls
FT120.2A	–/120/120 from both sides	Welded steel frame ex 150 mm Rondo studs, track and corner angles	2x16 mm FIRESTOP over ceiling 3x16 mm FIRESTOP under ceiling 2x16 mm FIRESTOP to both sides of wall frame

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Blue text indicates systems and products suitable for wet areas.

SOIL & WASTE PIPE

NCC/BCA Requirements

The National Construction Code (NCC) specifies the minimum standards for all buildings in Australia, including minimum standards for acoustic performance between residential dwellings.

This includes minimum acoustic performance of services that pass through more than Sole Occupancy Unit (SOU). The minimum acoustic requirement between an internal service (duct, soil, waste, water supply pipe) that passes through more than one SOU is:

- ***R_w+ C_{tr} 25 to a Non-Habitable Room***
  (Kitchens, Bathrooms, Laundry, Toilet, Pantry, Walk-in Wardrobe, Corridors, Hallways, Lobby, Photographic Darkrooms, Clothes-drying Room, and other spaces not occupied frequently or for extended periods of time.)
- ***R_w+ C_{tr} 40 to a Habitable Room***
  (A room used for normal domestic activities including Bedrooms, Living Rooms, Lounge Rooms, Music, Television, Dining, Sewing, Study, Playrooms, Home Theatre Rooms, Sunrooms and Family Rooms.)

These systems have been assessed by Renzo Tonin & Associates as compliant with NCC/BCA requirements for internal services. They are based on laboratory acoustic tests and opinions from Renzo Tonin & Associates. As suitably qualified acoustic consultants, Members of the Australian Acoustical Society and Association of Australasian Acoustical Consultants, they are able to certify systems under the NCC Part A2.2 (2)(c), Expert Judgement.

The opinions assume that the walls and/or ceilings are of good construction, with the perimeter sealed with acoustic mastic and no penetrations.

Description

The Knauf Soil and Waste Pipe Systems have been developed to provide practical information and options for compliance with the NCC.

A variety of systems including ceiling systems, risers, walls and bulkheads are presented to cover all practical situations. Systems with lagged services are presented as well as systems with no lagging where lagging is not practical to install.

Pyrotek® Soundlag™ 4525c with a minimum 25 mm insulation and an overall weight of not less than 5.0 kg/m^2 (or acoustically equivalent), has been used as the basis for the Knauf lagged Soil & Waste Pipe systems.

These tables and diagrams show NCC acoustic compliant systems. For installation and framing requirements, please refer to the relevant section for walls and/or ceilings.

Design Considerations

The systems presented here comply with the NCC acoustic requirements but site specific conditions must also be taken into consideration. Penetrations in the ceiling linings including for lights, mechanical services and access panels may reduce the acoustic performance of the systems.

Lighting

Most LED downlights are fully sealed and are expected to maintain the acoustic performance of the ceiling lining. For other lighting types, where they may be openings or gaps, acoustic advice should be sought from the supplier, manufacturer or acoustic consultant on the potential reduction in the acoustic performance and any additional acoustic treatment that may be required.

Access Panels

The NCC provides deemed to comply requirements for access panels (Specification F5.2 Section 2(e)(ii)). Alternatively, third party products are available that may be appropriate, but these should be assessed by an acoustic consultant to ensure that both the minimum NCC and project specific performance requirements are achieved.

Mechanical Services

Supply and return air ducts and grilles are likely to be the main source of noise flanking and most likely to reduce the acoustic performance of the ceiling and Soil & Waste Pipe system due to the relatively large open areas and generally lightweight products used. Specialist acoustic treatment of these elements (such as lagging, acoustic linings and attenuators etc) may be required to maintain the acoustic performance of these systems.

Knauf recommends that a suitably qualified acoustic consultant is engaged to review and provide advice on achieving the NCC requirements for a particular development.

SOIL & WASTE PIPE

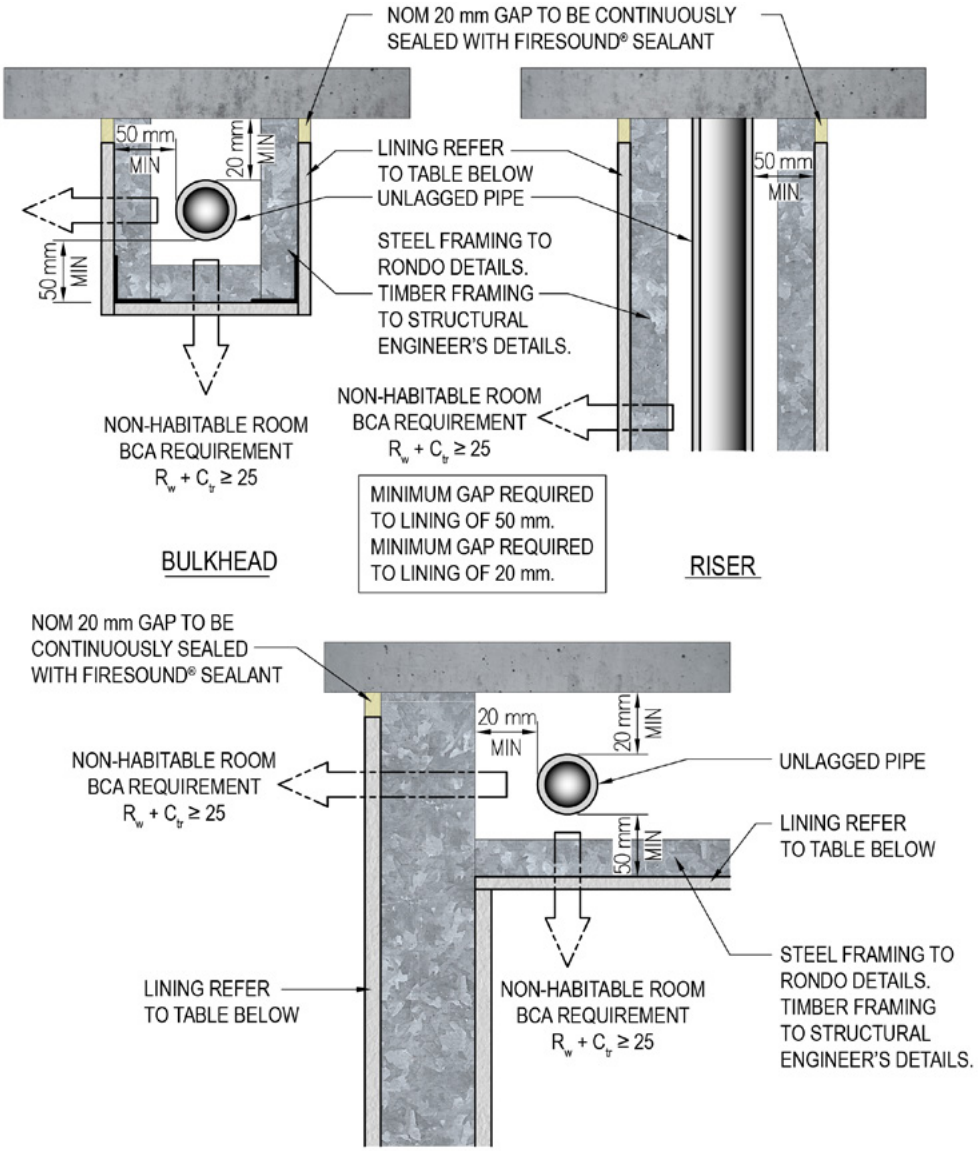

Figure I6: **Soil & Waste Pipe Systems - $R_w + C_{tr}$ 25 (No Lagging)**

BCA COMPLYING CONSTRUCTION (SOIL & WASTE PIPE TO NON-HABITABLE ROOM) MINIMUM $R_W + C_{tr}$ 25				
SYSTEM NO.	**INSULATION**	**WALL / CEILING / RISER LINING**	**$R_W (R_W + C_{tr})$**	**OPINION REFERENCE**
SWU.1A	Nil	1x10 mm SHEETROCK PLUS	28(25)	RT&A TK778-13F01
SWU.1B		2x10 mm SHEETROCK ONE	32(27)	
SWU.1C		1x13 mm SHEETROCK ONE	27(25)	
SWU.1D		1x13 mm WETSTOP	28(26)	
SWU.1E		1x13 mm FIRESTOP	29(26)	
SWU.1F		1x13 mm IMPACTSTOP	29(27)	

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Blue text indicates systems and products suitable for wet areas.

SOIL & WASTE PIPE

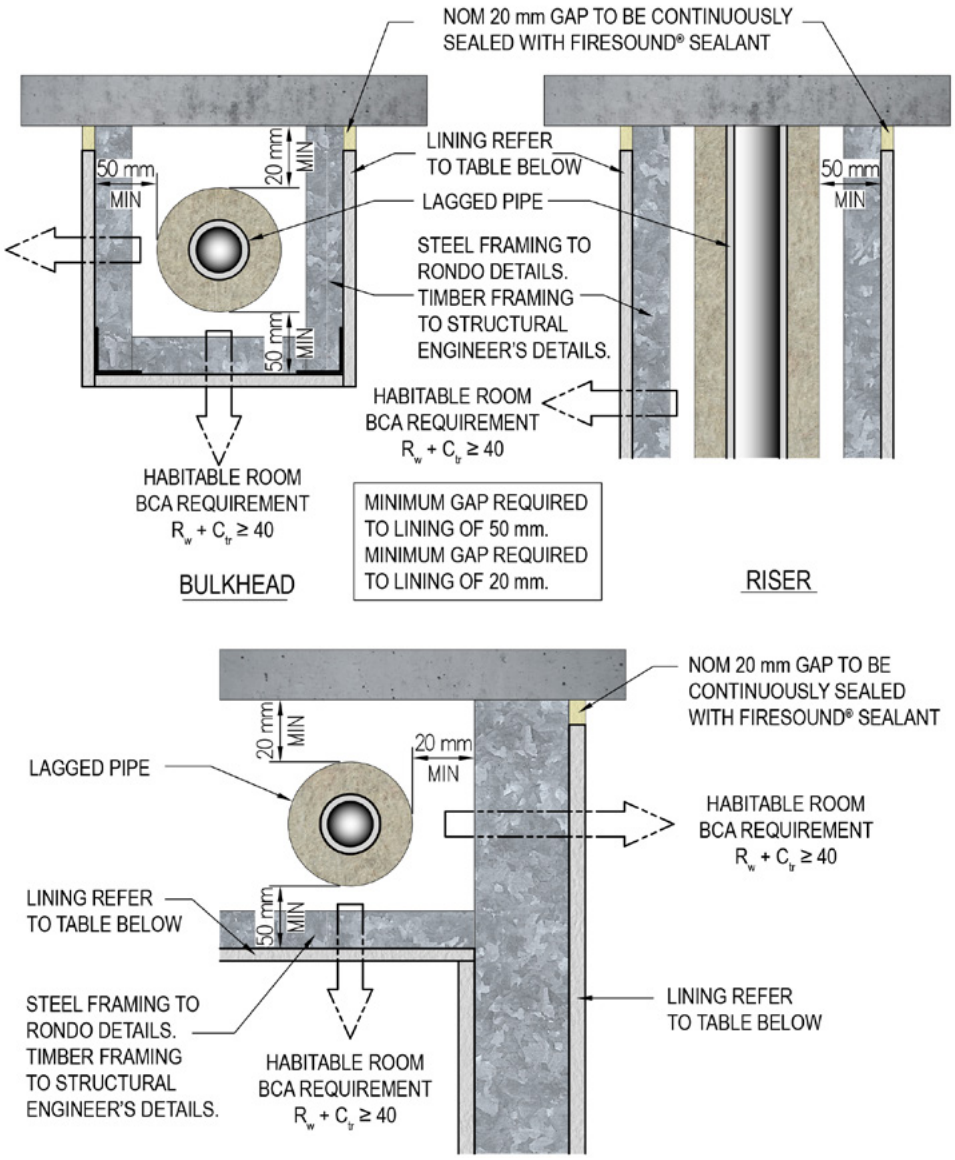

Figure I7: **Soil & Waste Pipe Systems - $R_w + C_{tr}$ 40 (Lagged Services)**

BCA COMPLYING CONSTRUCTION (SOIL & WASTE PIPE TO HABITABLE ROOM) MINIMUM $R_w + C_{tr}$ 40				
SYSTEM NO.	**PIPE LAGGING**	**WALL / CEILING / RISER LINING**	**R_W ($R_W + C_{tr}$)**	**OPINION REFERENCE**
SWL.1A	Pyrotek Soundlag 4525C (or acoustically equivalent product)	1x10 mm SHEETROCK ONE	50(40)	RT&A TK778-13F01
SWL.1C		1x10 mm SHEETROCK PLUS	52(42)	
SWL.1D		1x13 mm SHEETROCK ONE	51(41)	
SWL.1E		1x13 mm WETSTOP	52(42)	

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.

SOIL & WASTE PIPE

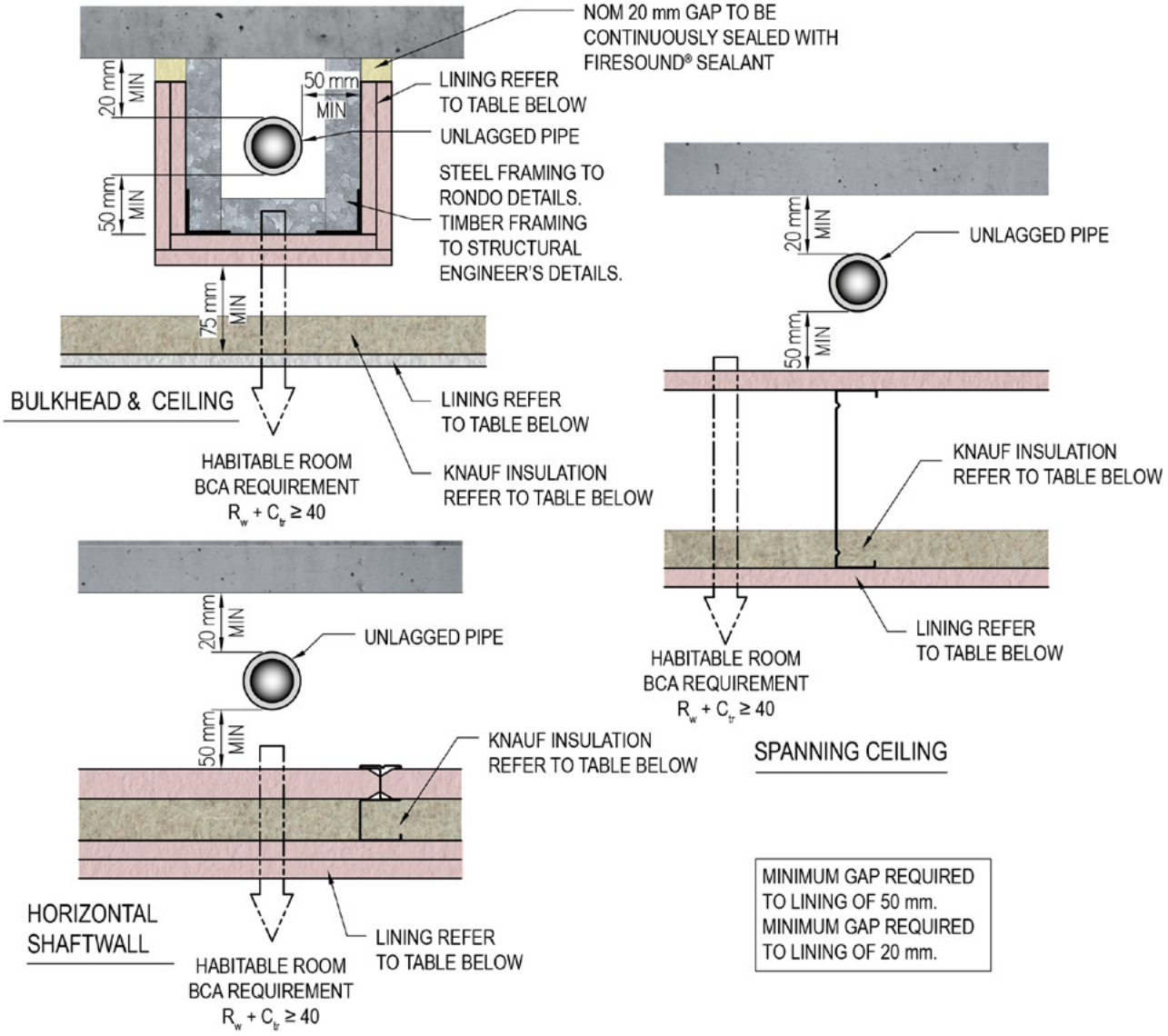

Figure I8: **Soil & Waste Pipe Systems - $R_w + C_{tr}$ 40 (No Lagging) Ceiling Systems**

BCA COMPLYING CONSTRUCTION (SOIL & WASTE PIPE TO HABITABLE ROOM) MINIMUM $R_w + C_{tr}$ 40

SYSTEM NO.	BULKHEAD / INTERNAL BOXING	INSULATION	CEILING SYSTEM	$R_w (R_w + C_{tr})$	OPINION REFERENCE
SWC.1A	Nil	KI 50G11 (to ceiling stud cavity)	**Upper**: 1x25 mm SHAFTLINER MOULDSTOP in 64CH55 steel stud (600 mm centres) **Lower**: 2x16 mm FIRESTOP	50(40)	RT&A TK778-13F01
SWC.2A		KI 90G11 (to ceiling stud cavity)	**Upper**: 1x16 mm FIRESTOP in 150CS75 steel stud (600 mm centres) **Lower**: 1x16 mm FIRESTOP	46(42)	
SWC.3A		KI 90G11 (to ceiling stud cavity)	**Upper**: 2x13 mm FIRESTOP in 150CS75 steel stud (600 mm centres) **Lower**: 1x13 mm FIRESTOP	49(43)	
SWC.4A	2x13 mm FIRESTOP on timber or steel framing	KI 75G11 1200 mm to either side of pipe	1x13 mm SHEETROCK ONE	50(40)	
SWC.5A	2x13 mm FIRESTOP on timber or steel framing		1x13 mm WETSTOP		

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.

SOIL & WASTE PIPE

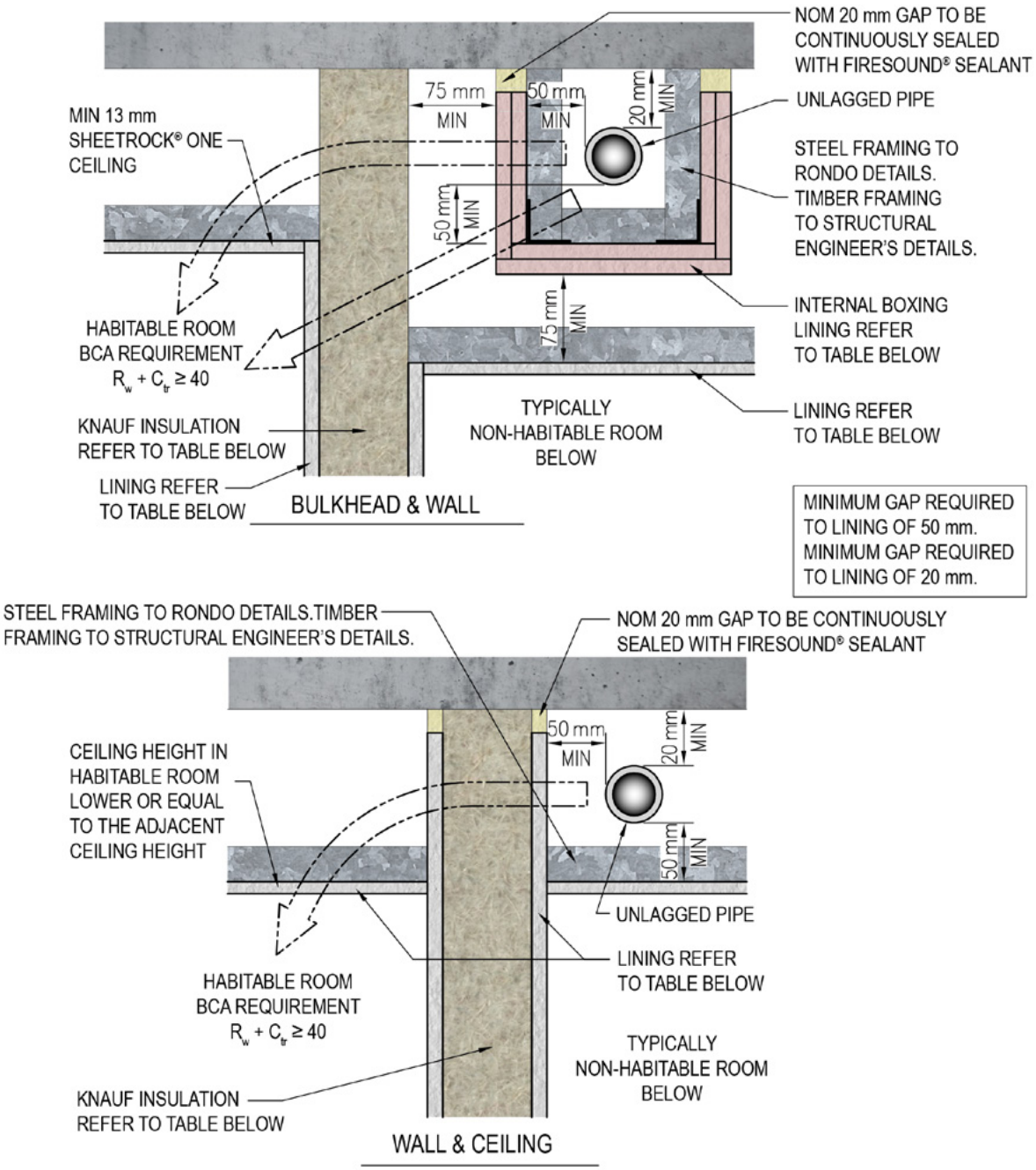

Figure I9: **Soil & Waste Pipe Systems - $R_w + C_{tr}$ 40 (No Lagging) Ceiling and Wall Systems**

BCA COMPLYING CONSTRUCTION (SOIL & WASTE PIPE TO HABITABLE ROOM) MINIMUM $R_W + C_{tr}$ 40						
SYSTEM NO.	**BULKHEAD / INTERNAL BOXING**	**INSULATION**	**CEILING**	**WALL SYSTEM**	**$R_W (R_W + C_{tr})$**	**OPINION REFERENCE**
SWW.1A	2x13 mm FIRESTOP on timber or steel framing	KI 50G11 (to stud wall cavity)	1x13 mm SHEETROCK ONE	1x13 mm SHEETROCK ONE to both sides of 64 mm steel stud (600 mm centres)	50(40)	RT&A TK778-13F01
SWW.1B	2x13 mm FIRESTOP on timber or steel framing					
SWW.2A	Nil				$R_w + C_{tr} \geq 40$	
SWW.2B						

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.

SOIL & WASTE PIPE

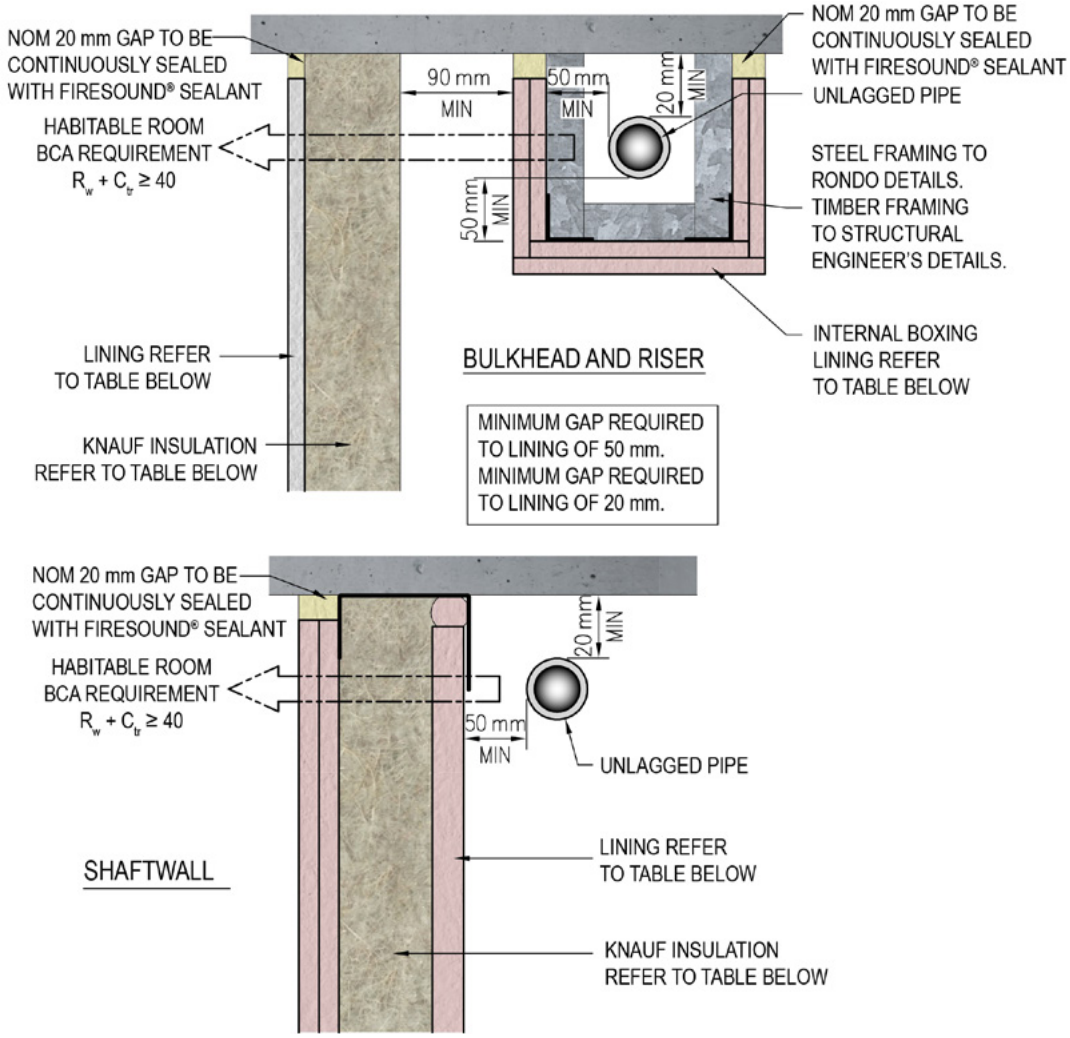

Figure I10: **Soil & Waste Pipe Systems - $R_w + C_{tr}$ 40 (No Lagging) Wall Systems**

BCA COMPLYING CONSTRUCTION (SOIL & WASTE PIPE TO HABITABLE ROOM) MINIMUM $R_W + C_{tr}$ 40

SYSTEM NO.	BULKHEAD / INTERNAL BOXING	INSULATION	WALL SYSTEM		$R_W (R_W + C_{tr})$	OPINION REFERENCE
SWR.1A	Nil	KI 50G11 (to wall stud)	64CH55 (CH stud)	1x25 mm SHAFTLINER MOULDSTOP in 64CH55 steel stud (600 mm centres) + 2x16 mm FIRESTOP to other side	50(40)	RT&A TK778-13F01
			102CH55 (CH stud)	1x25 mm SHAFTLINER MOULDSTOP in 102CH55 steel stud (600 mm centres) + 2x16 mm FIRESTOP to other side	51(42)	
SWR.2A	Nil	KI 50G11 (to wall stud)	1x25 mm SHAFTLINER MOULDSTOP in 102CH55 steel stud (600 mm centres) + 3x16 mm FIRESTOP to other side		49(40)	
SWR.3A	2x13 mm SHEETROCK ONE on timber or steel framing	KI 75G11 (to wall stud)	1x13 mm SHEETROCK ONE on seperate stud (90 mm gap between bulkhead and lining)		50(40)	
SWR.3B	2x13 mm WETSTOP on timber or steel framing		1x13 mm WETSTOP on seperate stud (90 mm gap between bulkhead and lining)		50(40)	
SWR.4A	2x13 mm FIRESTOP on timber or steel framing	KI 75G11 (to wall stud)	1x13 mm SHEETROCK ONE on seperate stud (90 mm gap between bulkhead and lining)		52(42)	
SWR.4B	2x13 mm MULTISTOP ONE on timber or steel framing		1x13 mm WETSTOP on seperate stud (90 mm gap between bulkhead and lining)		52(42)	
SWR.5A	Nil	Nil	Any valid Knauf wall system where $R_w + C_{tr} \geq 40$		$R_w + C_{tr} \geq 40$	Various (refer to Systems +)

MULTISTOP ONE HI may be a direct substitute for MULTISTOP ONE for FRL and acoustic performance of the same board thickness

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.