



***KNAUF SECUROCK®
GLASS-MAT SHEATHING
(EXTERIOR CEILING
SYSTEMS)***

knauf

Build on us.

EXTERIOR CEILING SYSTEMS

At Knauf, we believe the best innovations are purposefully focused to serve market needs. Through an ever-growing portfolio of groundbreaking products backed by unparalleled services, Knauf presents the Exterior Ceiling Systems.

The system consists of a versatile, easy-to-assemble, and cost-effective exterior metal framing system paired with Knauf Securock® Glass-Mat Sheathing.

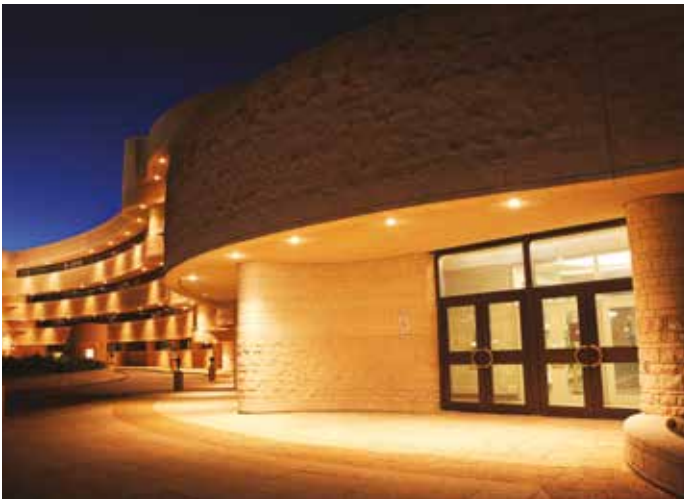
Using standard steel stud profiles and purpose-made accessories, the exterior metal framing can be designed to cater for various wind loads while providing a safe framework.

Knauf Securock® Glass-Mat Sheathing is the perfect solution as they offer the same speedy installation steps as traditional plasterboard but with higher resistance to mould and moisture. Knauf 3 coat jointing system also minimises joint cracks and the surface to be skim coated for a smooth finish.



Application

- Arrival Porch/Porte Cochère - Semi-exposed Ceilings



- Soffits - Fascia - Balcony - Walkways



EXTERIOR CEILING FRAMING SYSTEM

Eliminating Possible Occurrence of Typical Issues

When a properly designed exterior framing system is paired with Knauf's Securock® Glass-Mat Sheathing and finished to specification, an aesthetically pleasing ceiling can be achieved whilst eliminating the typical issues such as below:

Mould



Paint Peel



Crack



Cement or fibre cement boards typically have higher thermal and hydrometric movements.

Varied Quality Standards over Wide Product Range

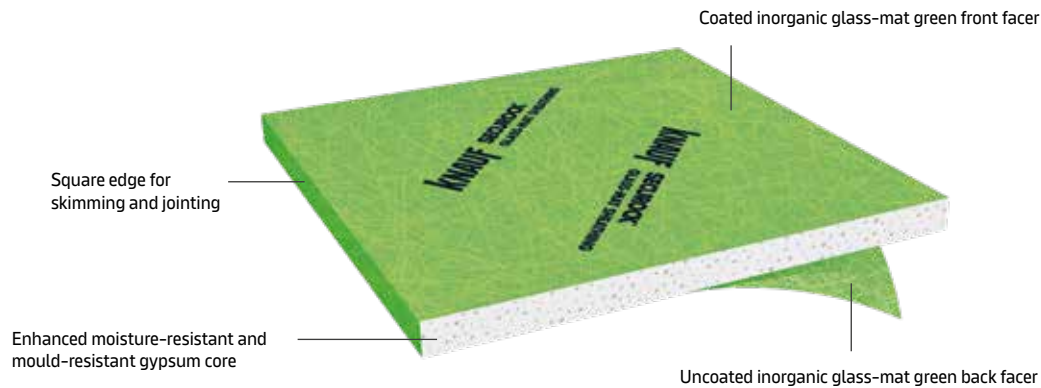
The wide variety of cement and fibre cement boards makes the installation and finishing works more difficult, expensive, and require multiple reworks.

Difficult Installation

Fibre cement boards are heavy and typically cut with a circular saw, require screw pre-drilling, and specific proper jointing method.



KNAUF SECUROCK® GLASS-MAT SHEATHING



Introduction

Knauf Securock® Glass-Mat Sheathing is a non-combustible, moisture-resistant and mould-resistant panel that offers an inorganic non-woven glass-mat facer that sheds water. It is designed for use in exterior partitions and ceilings.

Depending on wind load affecting the structure, the glass-mat panel should be supported by metal framing members designed to achieve deflection criteria of L/360. Refer to the submittal sheet for more information.

The panels can be finished with Knauf's tried and tested 3 coat jointing system to achieve level 4 finishing and skimmed to achieve level 5 finishing as per ASTM C840 before being painted.

Attributes	Advantages
 Mould-Resistant	■ High resistance to mould and mildew and scores a 10 (highest) when tested in accordance with ASTM D3273
 Moisture-Resistant	■ Specially engineered core for optimum water repellency and anti-sagging performance
 Fire-Resistant	■ Non-combustible and certified as Class O according to BS 476
 Quick, Dry, Installation	■ Quick score and snap, no sawing or special tools, and rapid screw or nail attachment

NOTE:

- ASTM C840 – Standard Specification for Application and Finishing of Gypsum Board
- ASTM D3273 – Standard Test Method for Resistance to Growth of Mould on the Surface of Interior Coatings in an Environmental Chamber
- BS 476-4 – Fire tests on building materials and structures. Non-combustibility test for materials

EXTERIOR CEILING FRAMING SYSTEM

Small Areas (Typically < 3.0m Span)

- Soffits
- Balcony Ceilings
- Exterior Corridors/Walkways
- Porches
- Fascias
- Ceilings of Building Extensions



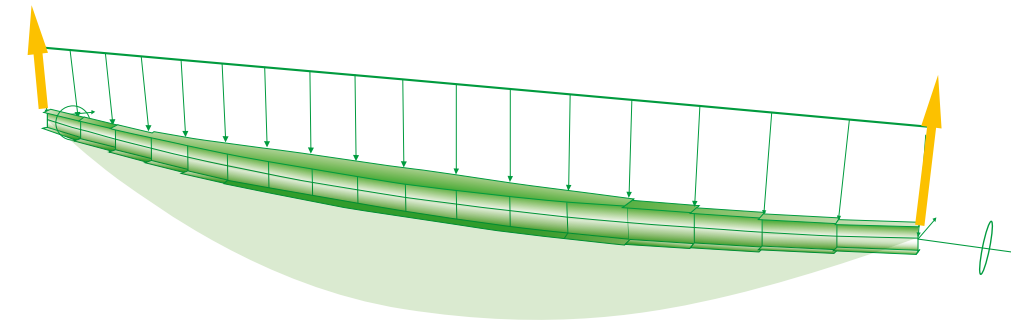
The exterior framing system is engineered for cost-effective and hassle-free installation.

Design and Safety Factors

Engineering designs and details cater for wind loads of up to 4.0kPa, for a maximum span of approximately 3.0m. Consult the Knauf office for spans exceeding 3.0m or wind load > 4.0kPa.

Single Span / No Hangers

The metal framing members are suspended on both ends (single span) without stud hangers, akin to installing a horizontal drywall framing.



A simply supported (suspended) single span analysis of load distribution from positive and negative wind loads to achieve deflection criteria of $L/360$.

Advantages of eliminating suspension hangers will make the framing system:



More Cost-Effective

- Less components and parts.



Easy Installation

- No need to install hangers; only require end of span fixing.



Consistently Flat

- No flatness adjustment required.



Safe Installation

- Less work-at-height requirements.

Stud and Tracks Ceiling System

Typical studs and tracks are used in this system without any hangers making the system quick and easy to install compared to traditional ceiling systems. Depending on the wind loads affecting the structure, the size or thickness of framing member may vary as below:

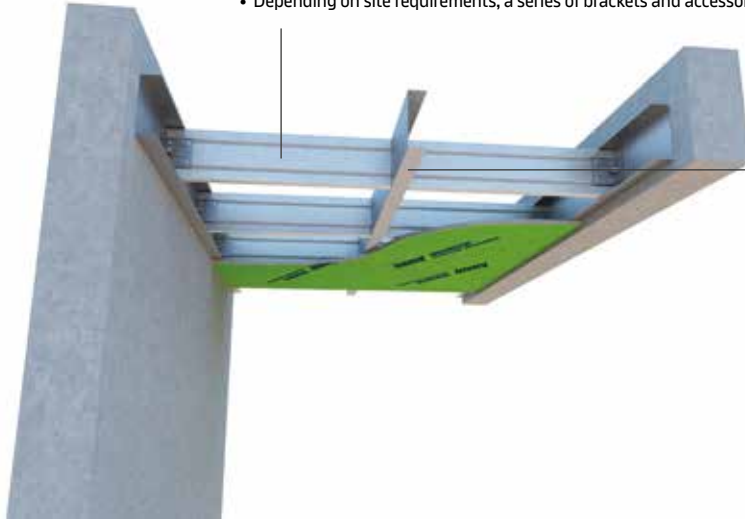
Stud Size: 150mm

Thickness: 0.75 to 1.15mm Base Metal Thickness

Coating: AZ150

Typical Details

- Stud size, gauge, and spacing are decided by engineering requirements.
- The framing members are installed horizontally, typically spanning the length of the ceiling.
- Depending on site requirements, a series of brackets and accessories can also be used.



Depending on windload, noggings are typically required as they provide lateral and torsional restraint to the vertical studs and prevent premature buckling, which increases the load that can be carried by the system.

Knauf Securock® Glass-Mat Sheathing External Soffit Application with Knauf Ceiling Stud System

Short span external ceiling with low wind pressure application without stud hanger.

No	Wind Pressure (kPa)	Max. Ceiling Span (mm)	Remarks
		406 ctc	
1	3m span		
	1.24 kPa	150 x 0.75BMT	PN545 12.7mm Board
	1.92 kPa	150 x 0.75BMT	SWC3 12.7mm Board
	2.4 kPa	BOXED 150 x 0.75BMT	SWC3 12.7mm Board
	2.8 kPa	BOXED 150 x 0.75BMT	SWC3 12.7mm Board
	3.2 kPa	BOXED 150 x 0.75BMT	SWC3 12.7mm Board
	3.5 kPa	BOXED 150 x 0.75BMT	SWC3 15.9mm Board
	4.0 kPa	Back to Back 150 x 1.15BMT	SWC3 15.9mm Board
No	Wind Pressure (kPa)	Max. Ceiling Span (mm)	Remarks
		610 ctc	
2	3m span		
	1.0 kPa	150 x 0.75BMT	PN545 12.7mm Board
	1.24 kPa	BOXED 150 x 0.75BMT	SWC3 12.7mm Board

Design Parameter:

- Ceiling board based on Securock® Glass-Mat Sheathing board
- Knauf stud ceiling without stud hanger
- Deflection criteria L/360
- Based on max. wind pressure of 4.0 kPa
- Nogging required span above 2m

Minimum Bridging Requirements		
Ceiling Span	Lining Condition	No. of Noggings
Single Span		
0 – 2.0	Lined one side	0
2.0 – 3.0		1
Multiple Span		
3.0 – 4.0	Lined one side	1
4.0 – 6.0		2
6.0 – 8.0		3

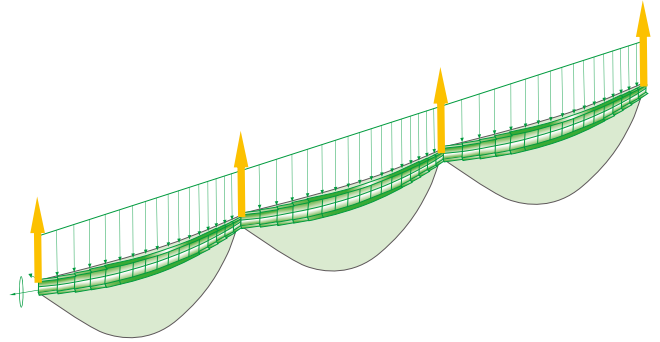
EXTERIOR CEILING FRAMING SYSTEM

Large Semi Exposed Area (Typically > 3.0m Span)

- Hotel Lobbies
- Casino Entrances
- Building Foyers
- Arrival Porch/Porte Cochère
- Transportation Hubs

Multiple Span Design

Engineering designs using simply supported multiple-span framing reduce the need for costly large and/or heavy gauge studs. It also guards against possible occurrences of multiple positive and negative forces over a large span of area.



Studs

Typical stud profiles are used in this system together with a specially designed exterior bracket. The system is easy to install with the use of #12 gauge hex head self-drilling screws. Depending on the wind loads affecting the structure, the size or thickness of framing member may vary as below:

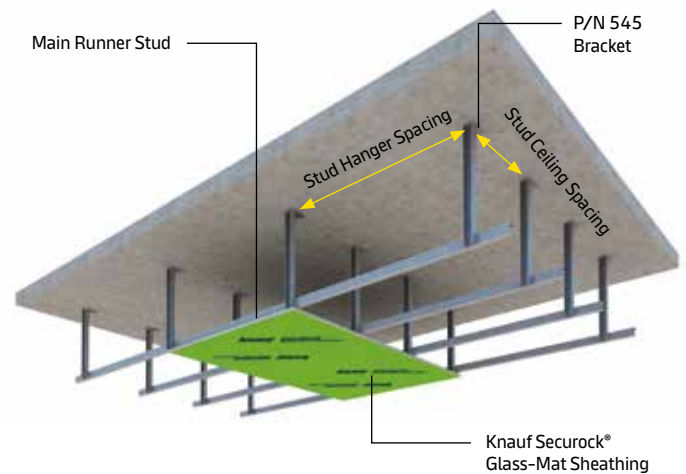
Stud Size: 51 to 150mm

Thickness: 0.50 to 1.15mm Base Metal Thickness

Coating: AZ150

NOTE:

- Maximum spacing as shown. Consult the Knauf office for screw and framing spacing details.
- Screw spacing for glass-mat panel varies depending on wind load.
- Refer to components list on Page 11.



Hanger - Slab Connection

- Through careful engineering, studs provide tension (hanging) and compression (uplift) capacity to the framing system as it copes with the service and wind loads acting on the exterior ceiling.
- P/N 545 bracket anchored with approved M8 anchor and screw-fixed to stud with 4 nos. #12 hex head screw.

Hanger - Main Runner Connection

- Hangers are fastened back-to-back to main runner stud with min. 2nos. #12 hex head screws.



Board Technical Performance for Exterior Ceiling:

Exterior Ceiling Stud System with 12.7mm (½") Knauf Securock® Glass-Mat Sheathing Panel for Ceiling Span ≥ 3.0m			
Max. wind pressure	Stud Size	Stud Hanger Spacing	Stud Ceiling Spacing
1.0 kPa	51mm x 0.5BMT	1220mm	610mm
1.24 kPa		1100mm	610mm
1.92 kPa		1100mm	406mm
Nogging at mid span required. Refer to minimum bridging requirement (page 6).			

Exterior Ceiling Stud System with 15.9mm (5⁄8") Knauf Securock® Glass-Mat Sheathing Panel for Ceiling Span ≥ 3.0m			
Max. wind pressure	Stud Size	Stud Hanger Spacing	Stud Ceiling Spacing
3.5 kPa	51mm x 0.5BMT	900mm	406mm
4.5 kPa		900mm	305mm
Nogging at mid span required. Refer to minimum bridging requirement (page 6).			

NOTE:

- Consult the Knauf office for stud and screw spacing
- Screw spacing for glass-mat panel varies depending on wind load

Allowable Uniform Wind Load for Knauf Securock® Glass-Mat Sheathing 12.7mm (½") Panel and Fastener Recommendation							
Wind pressure		0.77 kPa 16 psf	0.81 kPa 17 psf	1.24 kPa 26 psf	1.67 kPa 35 psf	1.92 kPa 40 psf	3.59 kPa 75 psf
Board Thickness	Stud Spacing	Recommended Screw Spacing					
½" (12.7mm)	304	203	203	203	203	102	102
	406	203	203	203	152	102	
	610	203	152	102			

Allowable Uniform Wind Load for Knauf Securock® Glass-Mat Sheathing 15.9mm (⅝") Panel and Fastener Recommendation									
Wind pressure		1.15 kPa 24 psf	1.29 kPa 27 psf	1.63 kPa 34 psf	1.82 kPa 38 psf	2.39 kPa 50 psf	3.21 kPa 67 psf	3.59 kPa 75 psf	4.59 kPa 96 psf
Board Thickness	Stud Spacing	Recommended Screw Spacing							
⅝" (15.9mm)	304	203	203	203	203	203	152	102	102
	406	203	203	203	203	152	102	102	
	610	203	152	102					

NOTE:

The "values in this table are based on testing per ASTM E330 and represent the capacity of the sheathing to resist flexural failure or fastener pull-through with a safety factor of 3.0. Capacities are based on a minimum fastener head diameter of 0.325" (#6 bugle head screw). The withdrawal resistance of fasteners from framing is different on several factors, including but not limited to fastener type, fastener length, and framing properties. The specification of fasteners is the responsibility of the Designer. Manufacturer's recommendations are given below. These capacities assume continuous support of each stud flange over the full length of the sheathing panel. Allowable pressures are based on a maximum deflection limitation of L/360. Consult Knauf representative for higher deflection limitations.

COATING MASS RECOMMENDATION

Corrosivity Category: AS4312	Min. Coating Recommendation
	55% Aluminium-Zinc Coating
Very Low to Medium *Dry Indoors to Coastal or Industrial	AZ150
High *Sea-shore (Calm)	>ZA150
Very High-Marine *Sea-shore (Surf)	Refer to AS 4312 recommendation for coastal area.

SEMI-PROTECTED CEILING FINISHING

Finishing with Knauf's Compounds

The term 'level of finish' applies to the ceiling lining prior to decoration. As per ASTM C840 (Application and Finishing of Gypsum Board) defines levels of finish 3, 4 and 5. Level 4 is the default level of finish for ceiling linings such as Knauf Securock® Glass-Mat Sheathing, unless specified otherwise.

It is essential that the level of finish is determined at the design stage since each level has specific requirements for tolerances of the metal framing and glass-mat panel installation, jointing, and finishing. The desired level of finish may not be achieved unless all of these requirements are met through various stages of construction.

Mock-Up

A mock-up is recommended for a visual standard.

- Level 4 finish joints and skim coat
- The jobsite standard(s) shall dictate if additional skim coat(s) is required (Level 4 or 5 Finish).

Application

- Panels should not be finished until the building is enclosed and panels are dry.
- Level 4 finish jointing is recommended for glass-mat panels used in soffit areas and should be performed in accordance with ASTM C840 as per plasterboard jointing.
- For Knauf Securock® Glass-Mat Sheathing, a skim coat is strongly recommended in all Level 4/5 finish glass-mat applications for protected exterior ceiling areas.
- A high-quality exterior grade primer and paint are recommended. Please refer to paint manufacturer for recommendation.

Levels of Finish



Level 4

- The default and generally accepted level of finish for glass-mat panels
- Examples: Flat paints, light texture, and smooth ceiling are specified
- Level 4 joints, sanded and apply up to two skim coats (minimum 1mm thickness/coat) with recommended Knauf compound, and gently sand each skim coat before applying the next coat for best result.
- The skim coat surface must be smooth and free of tool marks and ridges (a light sanding of the skim coat may be necessary to remove tool marks).
- Application of a good quality primer is recommended prior to decorating.



Level 5

- This finish is characterised by a parity of surface texture and porosity.
- Examples: Exposure to critical lighting, paints with high sheen levels other than flat are specified, and high value spaces where the highest quality finish is expected.
- Level 4 joints, sanded and apply a minimum of two skim coats over entire glass-mat surface (minimum 1mm thickness/coat) with Knauf Compound, gently sand each skim coat before applying the next coat for best result; a Level 5 surface as per paint manufacturer's recommendation may be used after the glass-mat surface has been skim coated, sanded, and smooth.
- The skim coat surface must be smooth and free of tool marks and ridges (a light sanding of the skim coat may be necessary to remove tool marks).
- Application of a good quality primer is recommended prior to decorating.

Finishing with Other Proprietary Basecoats

The panels can be joint treated with other proprietary basecoats and mesh. The ceiling is then typically finished off with the manufacturer's recommended finishing system.

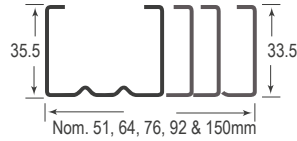
General Requirements:

- After ensuring that Knauf Securock® Glass-Mat Sheathing is installed according to Knauf's installation guide, examine that the panel surfaces and adjacent materials are dry, clean, and sound.
- Verify the surface is flat and free of irregularities such as dust and debris.

Joint Treatment and Surface Treatment:

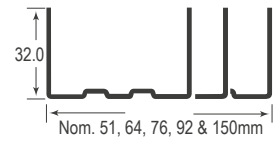
- If using other proprietary products, then the respective company should advise on the applications and steps.
- Follow the manufacturer's recommendations and guidelines for the installation.

COMPONENTS



Knauf Metal Stud

Dimensions: 5mm (Lip) x 35mm (Flange) x Specified Web Width
 Steel Grade: G300
 Min. Yield Strength: 300 MPa
 Anti-Corrosion Coating: AZ150
 Base Metal Thickness: 0.50mm to 1.15mm



Knauf Floor Track

Dimensions: 32mm (Flange) x Specified Web Width
 Steel Grade: G300
 Min. Yield Strength: 300 MPa
 Anti-Corrosion Coating: AZ150
 Base Metal Thickness: 0.50mm to 1.15mm



Knauf SWC3 Bracket

Dimensions: 75mm (L) x 50mm (W) x 80mm (H)
 Steel Grade: G2
 Min. Yield Strength: 270 MPa
 Anti-Corrosion Coating: Zinc Coating
 Base Metal Thickness: 3.0mm



Knauf P/N 545

Dimensions: 75mm (L) x 75mm (W) x 55mm (H)
 Steel Grade: G2
 Min. Yield Strength: 270 MPa
 Anti-Corrosion Coating: Zinc Coating
 Base Metal Thickness: 1.5mm



Anchor

Dimensions: M8 x 40 (Sleeve Diameter 10mm)
 Coating: Zinc
 Tensile Strength: 2.0kN (min.)
 Shear Force: 3.9kN (min. at Design Resistance)



Wafer Head Drill Point Screw

Dimensions: #10 – 16 x 16 (Diameter: 4.6mm)
 Coating: High Corrosion-Resistant Coating
 Pull-out Force: 1.16kN (20 Gauge Steel)
 Shear Force: 2.51kN (20 + 20 Gauge Steel)
 Tensile Strength: 6.09kN



Hexagon Head Drill Point Screw

Dimensions: #12 – 14 x 20 (Diameter: 5.5mm)
 Coating: Zinc
 Pull-out Force: 1.3kN (20 Gauge Steel)
 Shear Force: 2.67kN (20 + 20 Gauge Steel)
 Tensile Strength: 10.34kN



Exterior & Wet Area Bugle Head Needle Point / Drill Screw (GMS type S / GMS type D)

Dimensions: #6 – 20 x 32 and 45 (Diameter: 3.5mm)
 Coating: Ruspert/Dacromate
 Min. Torsional Strength: 2.7 N.m
 Surpasses 1000 hours ASTM B117: Salt Spray Test



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