KNAUF

FIBEROCK® AQUA-TOUGH™ MANUAL

Multi-attribute
Multi-application
Multi-function Gypsum Board

Build on us.

All works undertaken to prescribe the use of or to install Knauf's products and systems must be performed by experienced and, where required by applicable laws, appropriately licensed personnel. Knauf's products and systems must be installed in accordance with Knauf's installation manual, Systems+, and any other product or system specific literature issued by Knauf. If installation works are not performed in compliance with such product literature, by experienced and licensed personnel, or are incorrectly performed by experienced or licensed personnel, there is a serious risk that the works, application and performance of the relevant system or products will be compromised, which could result in property damage, injury or death.

All personnel who undertake works to install Knauf's products and systems must comply with all applicable health and safety laws, including wearing appropriate personal protection equipment. If personnel do not comply with applicable health and safety laws, including by not wearing appropriate personal protection equipment, there is a serious risk of injury or death.

All of Knauf's products and systems must only be used for the uses identified in this document (and any other product or system specific literature issued by Knauf from time to time). Before prescribing or using any Knauf product or system for any other use, you must contact Knauf. All recommended component parts for Knauf's products and systems should be used and not substituted for other products. If component parts are substituted, there is a serious risk that the works, application and performance of the relevant system or products will be compromised, which could result in property damage, injury or death.

This product manual is intended to provide general information on plasterboard products and should not be used as a substitute for professional building advice. We recommend you use a qualified person to install Knauf plasterboard. To ensure the information you are using is current, Knauf recommends you review the latest building information available on the Knauf website Knauf.com. For further information contact TecASSIST or your Knauf representative.

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FIBEROCK AQUA-TOUGH

Introduction

FIBEROCK Aqua-Tough is the ideal multi-attribute, multi-function panel designed to meet the demands of modern construction. These paperless and homogenous gypsum fibre boards feature a fire-, mould-, and water-resistant core, offering exceptional performance in challenging environments. Easy to cut with the score-and-snap method, especially when compared to fibre cement boards, and install with minimal site wastage, FIBEROCK Aqua-Tough ensures efficiency and precision during application.

Description

FIBEROCK Aqua-Tough is suitable for a variety of applications, including interior walls and ceilings, where it meets diverse design performance and NCC requirements. It is also ideal for ceiling areas protected from direct rain exposure, such as soffits, and can be used as a flooring underlay when paired with selected Knauf systems.

With 95% recycled content, FIBEROCK Aqua-Tough is a Good Environmental Choice Australia (GECA) certified and may contribute to Green Star credits when assessed under various Green Star rating tools.

GOOD ENVIRONMENTAL CHOICE AUSTRALIA
GECA CERTIFIED

GENERAL INFORMATION

Features and Benefits

- High density, homogeneous composition, and a paperless surface finish make FIBEROCK Aqua-Tough strong and durable
- Superior durability – resistant to general wear and tear, including indentation, impact (soft body and hard body), and joint strength
- Mould and water-resistant, dimensionally stable, and ideal for wet area applications to meet NCC requirements
- Non-combustible and fire-resistant for up to 2 hours in wall systems
- High density ensures excellent noise and acoustic insulation performance
- Supports up to 50 kg/m² of tiles
- Capable of supporting wall fixtures like paintings and wall furniture without the need for cavity noggings
- 3D design effects possibilities
- Integrated with BIMWIZARD (Revit, ArchiCAD) for seamless design integration
- Simple and easy to install, just like plasterboard
- Sustainability:
  - Low embodied energy
  - GECA certified
  - 95% recycled content
  - Low wastage due to reuse of off cuts
  - Demountable and reusable.

Unique FIBEROCK Aqua-Tough Technology

In the manufacture of FIBEROCK Aqua-Tough interior linings, a highly refined cellulosic fibre is heated under pressure in a ground gypsum rock slurry. During this process, volatile materials are removed, and the fibre is mineralised as the gypsum rock nucleates into the natural apertures of the fibre walls. This results in exceptional strength and stiffness.

The lining surface is formed through a process called 'floatation,' which directly creates a smooth, mineral-rich surface. This method eliminates the fibre fluff typically associated with other products that require sanding to achieve smoothness during production. FIBEROCK Aqua-Tough interior linings are finished with a factory-baked clear sealer, ensuring even suction for subsequent jointing, painting, and other finishing systems.

The three scanning electron microscope images in Figure 2, shown with increasing magnification (from left to right), depict the close bonding of cellulose fibre strands to gypsum rock crystals. This includes the formation of gypsum crystals within the natural apertures of the fibres. This bonding, achieved through a patented manufacturing process, underpins FIBEROCK Aqua-Tough's exceptional impact resistance and durability.

Figure 1 - The Edge Profile of FIBEROCK Aqua-Tough

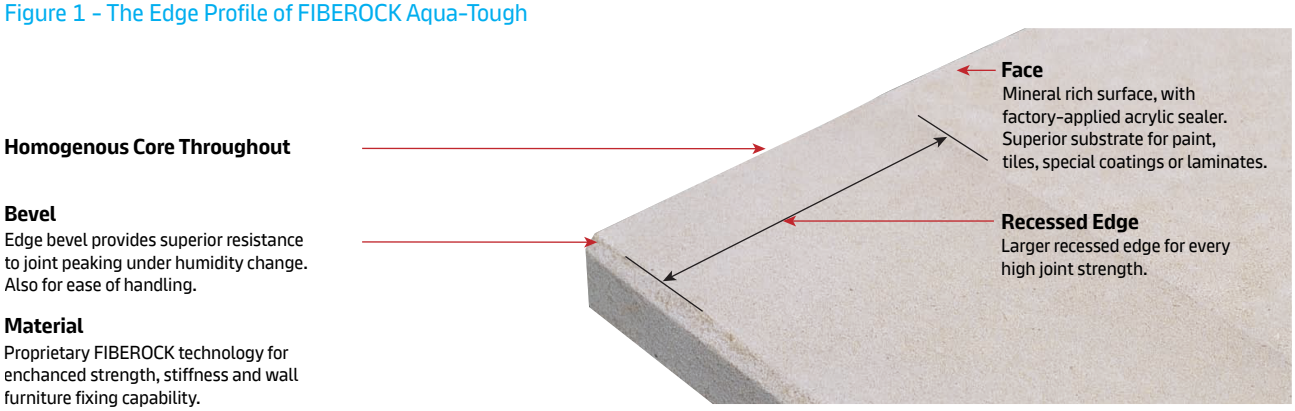
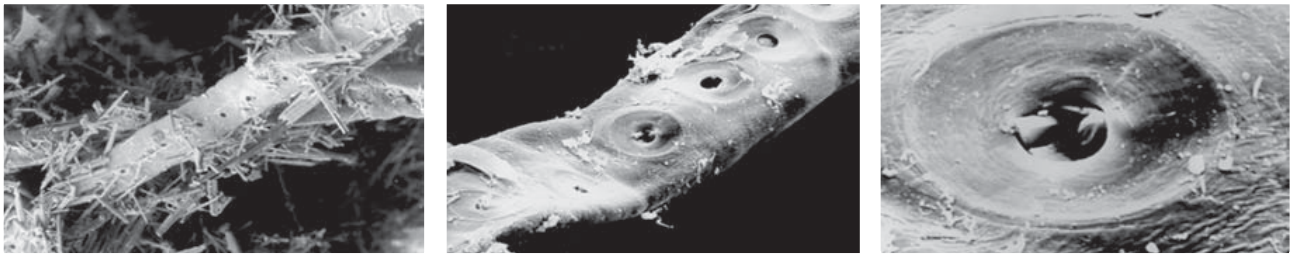


Figure 2: Microscopic View of Gypsum Rock Crystals



GENERAL INFORMATION CONT.

Product Properties and Performance

Table 1: Properties

Knauf Item Code	Product Description (Thickness x Width x Length)
00856670	12.70 mm x 1219 mm x 3050 mm (½" x 4' x 10' IMP)
00856580	15.88 mm x 1219 mm x 3050 mm (⅝" x 4' x 10' IMP)

Feature	Specification
Nominal Thickness	12.70 mm (½" IMP) & 15.88 mm (⅝" IMP)
Edge Profile	Recessed edge
Surface Finish	Smooth, paper-less
Nominal Mass	12.70 mm (½" IMP) – 11.7 kg/m²
	15.88 mm (⅝" IMP) – 15.1 kg/m²
Fire Hazard Properties	Group 1 – as per the NCC Specification S7C4 Fire Hazard Properties – Walls and Ceilings, determined in accordance with AS 5637.1:2015
Combustibility	Non Combustible material as tested to AS 1530.1-1994
VOC	Less than 0.5 mg/m³ TVOC
Thermal Resistance ASTM C518-2017	12.70 mm (½" IMP) - 0.46 m²K/W
	15.88 mm (⅝" IMP) - 0.53 m²K/W
Recycled Content	95%
Embodied Energy*	5.5 MJ/kg
Manufacture	Manufactured in USA to meet the requirements of ASTM C1278
Availability	Refer Knauf Sales Office for product range and availability

Cradle to grave.

Notes

The FIBEROCK Aqua-Tough board sizes supplied by Knauf are in imperial measurements: 15.88 mm x 1219 mm x 3050 mm (⅝" x 4' x 10' IMP) and 12.70 mm x 1219 mm x 3050 mm (½" x 4' x 10' IMP). For simplicity and alignment with Australian standards and measurements, we will refer to FIBEROCK Aqua-Tough as 16 mm (for 15.88 mm) and 13 mm (for 12.70 mm) throughout this document.

Table 2: Performance Attributes

Feature	Specification
Mould Resistance	10 (no mould growth) – ASTM D3273
Water Resistance	Yes, complies with NCC and AS 3740
Acoustic Insulation	Up to R_w 74, R_w+C_{tr} 66 (dependent on systems)
Fire Resistance	Up to FRL -/120/120
Tile-Carrying Capacity	50 kg/m²
Durability	Yes, paperless high density homogenous core makes FIBEROCK Aqua-Tough strong and durable
Fastener Shear Capacity*	Single screw - 13 kg Single Hilti HHD-S - 120 kg
Soft Body Impact	Complies with Specification 6, NCC 2022
Hard Body Impact	Ultimate impact resistance
Demountable / Reusable	Yes
Low Installation Wastage	Yes, off cuts can be rebated and reused
Surface Flatness for Decoration	Best in class (butt joints can be eliminated)
Compatibility with Other Products	Compatible with plasterboard installation and jointing compounds (no control or expansion required at junction) Can be used with fire-rated plasterboard to achieve Fire Resistance Level
Control Joints	12 m centres internal, 6 m external
Sustainability Certification	GECA

Key

Ultimate Impact Resistant
Mould Resistant
Fire Resistant
Acoustic Performance
Water Resistant

GENERAL INFORMATION CONT.

This manual provides design and performance information relating to FIBEROCK Aqua-Tough and explores key considerations for design and building professionals when specifying and building with FIBEROCK Aqua-Tough.

Design Versatility – One Board Many Applications

FIBEROCK Aqua-Tough is engineered to be the ideal multi-attribute, multi-performance lining in the Australian market. Packed with numerous key features, it is the suitable choice for specification across a wide range of construction segments and applications.

Segments

- Gymnasiums
- Hospitals/Mental Health facilities
- Education
- Hotels
- Museums/Art galleries
- Shopping centres
- Commercial buildings
- Correctional facilities
- High-end residential

Applications

- Fire-rated and high-impact areas, such as lobby or corridor; health or education facilities including isolation rooms, hospital corridors, prisons, offices, gyms, apartments, basement, car parks
- Wet areas: bathrooms, kitchens, laundries, basements; mould resistant
- Enhances acoustics: cinemas, schools, apartments
- Suitable for high-wind external soffits
- Commercial kitchens (not near commercial catering appliances)

DESIGN CONSIDERATIONS

Fire Resistance

FIBEROCK Aqua-Tough panels are engineered to deliver excellent fire resistance, thanks to their material composition, which includes chemically combined water. When used in a system (wall or ceiling), this composition contributes to fire resistance by releasing chemically bound water as steam, slowing heat transmission.

FIBEROCK Aqua-Tough undergoes rigorous fire resistance testing to meet NCC requirements. As a homogenous, paperless gypsum product, it also demonstrates exceptional fire reaction performance, achieving a Group 1 classification with an average specific extinction area of 28.6 m²/kg - well below the 250 m²/kg limit. Additionally, it is classified as a non-combustible lining, meeting the requirements of AS 1530.1 and the NCC.

Knauf has developed numerous fire-rated wall systems incorporating FIBEROCK Aqua-Tough, achieving fire resistance levels (FRL) of up to 120 minutes. For detailed design information and system specifics, refer to the systems section of this manual or Knauf eTools.

Acoustic

FIBEROCK Aqua-Tough features a homogenous, high-density core that delivers excellent acoustic insulation across a variety of wall configurations. It offers versatile solutions for environments such as healthcare, education, apartments, and aged care facilities.

Knauf systems incorporating FIBEROCK Aqua-Tough can achieve acoustic ratings of up to R_w 74 and R_w+C_{tr} 66. These performance levels have been independently verified and assessed by Renzo Tonin & Associates to meet project-specific and NCC requirements.

For more information, refer to the Knauf systems section in this manual.

Water Resistance

FIBEROCK Aqua-Tough is engineered for excellent water resistance, with the ability to suppress water absorption throughout both the core and surface area. Its homogenous core and paperless surface eliminate the risk of delamination or fibre separation, while also providing mould resistance and dimensional stability against changes in moisture and temperature. This makes it ideal for demanding wet environments such as bathrooms and other wet areas.

FIBEROCK Aqua-Tough can be used as an alternative wall lining in Knauf wet area systems and can be installed using the same fixing, jointing, and waterproofing materials and details specified for water-resistant plasterboard.

Figure 3: FIBEROCK Aqua-Tough Water Weight Gain

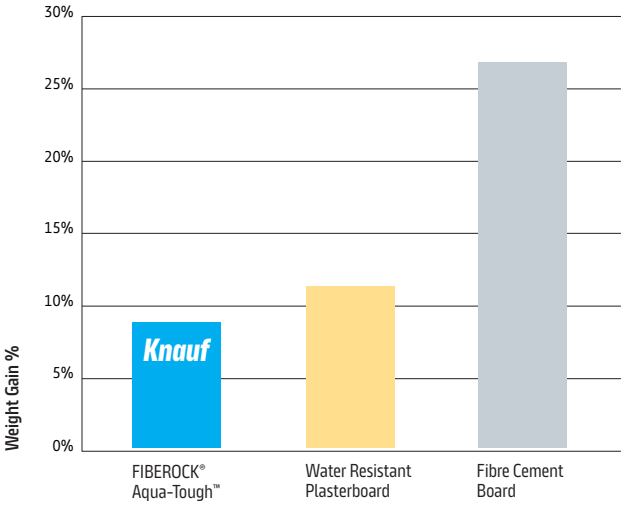


Table 3: FIBEROCK Aqua-Tough Water Resistance Performance

Standards Requirement	Performance Specification	Performance Achieved
ASTM C 473 /C 2178 Water resistance of core, (percentage weight gain)	5% max	2.72%
ASTM C 473 /C 2178 Surface water absorption (weight gain)	1.6 g max	0.7 g

Structural

Knauf's FIBEROCK Aqua-Tough systems have been developed and performance-tested with Rondo steel framing to meet the relevant Australian Standards and NCC requirements for structural integrity, acoustic performance, and fire resistance. These systems comply with Specification 6, as outlined below:

Table 4: FIBEROCK Aqua-Tough to Specification 6 Requirements

NCC Specification 6 Requirements	FIBEROCK Aqua-Tough Performance
Materials Performance to Relevant as Referenced by NCC	✓
Resistance to Damage (Cracks, Penetrations)	✓
Resistance to Surface Indentation	✓
Resistance to Static Pressure	✓
Resistance to Impact (Soft Body)	✓

DESIGN CONSIDERATIONS CONT.

Durability

Durability and in-service performance of linings are often secondary considerations when specifying materials, as fire, acoustics, and other fundamental performance requirements typically take precedence in projects and NCC compliance. However, FIBEROCK Aqua-Tough stands out with its unique technology, featuring a homogenous core, paperless surface, and exceptional density, making it one of the most durable gypsum boards available.

The durability of FIBEROCK Aqua-Tough is assessed through the following tests:

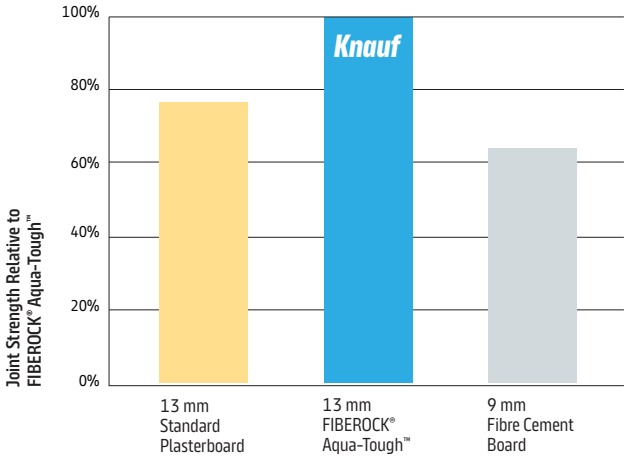
- Joint strength
- Surface indentation resistance
- Hard body impact resistance
- Soft body impact resistance.

Joint Strength

The strength of sheet-to-sheet edge jointing is one of the most critical performance factors for durable wall systems. During an impact, the force exerted on a wall creates high stresses on sheet joints. To address this, FIBEROCK Aqua-Tough wall systems are designed with enhanced joint strength, achieved through the following unique features:

- **Enlarged recessed dimensions:** FIBEROCK Aqua-Tough features recessed edges with enlarged dimensions compared to most other panels, providing stronger and more reliable joints
- **Stronger surface bonding:** The surface sealer of FIBEROCK Aqua-Tough is optimised for excellent adhesion, ensuring superior bonding of jointing compounds. Unlike paper-faced boards, the homogenous structure eliminates the risk of surface delamination
- **No wide-set butt-end jointing:** Weak surface jointing without recessed edges is avoided, as additional recessed edges can be formed on-site during installation, ensuring consistent joint strength
- **Proven joint strength:** Comparative testing of joint strength, using the manufacturer's recommended jointing materials, demonstrates the superior performance of FIBEROCK Aqua-Tough.

Figure 4: Comparative Joint Tensile Strength for Different Lining Materials

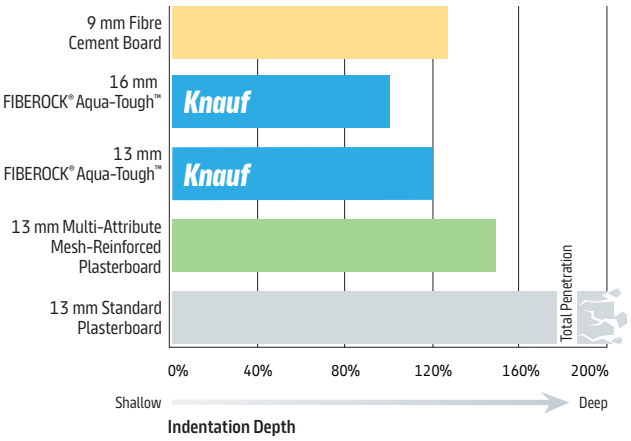


Indentation Resistance

Small, hard objects are a common cause of indentation damage to walls. These objects may include carried items such as luggage, containers, tools, and other equipment. While such damage is typically accidental, if left unrepaired, it can lead to further deterioration over time.

To assess the durability of wall linings against such impacts, the standard international test ISO 7892:1998 is used. This test simulates a severe small hard body impact by dropping a 1.0 kg steel ball through an arc to strike the lining material.

Figure 5: Indentation Relative to 16 mm FIBEROCK Aqua-Tough Interior Linings - Small Hard Body Impact Test



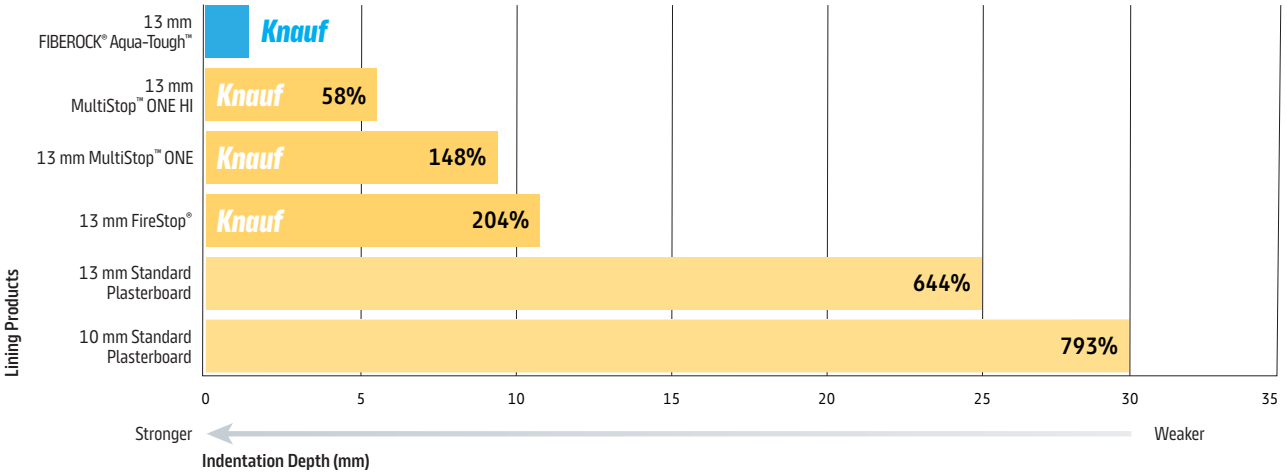
DESIGN CONSIDERATIONS CONT.

Hard Body Impact

FIBEROCK Aqua-Tough undergoes extensive hard body impact testing to simulate larger impact loads, such as a bump from a hospital trolley or an internal kick to a wall surface. The testing is conducted using a pendulum swing with a 100 mm diameter, 4.0 kg steel ball on a 3.0 m axis, applied against various lining partitions at a predetermined energy level. This process measures the size of the local damage and the depth of penetration or rupture caused by the projectile (steel ball).

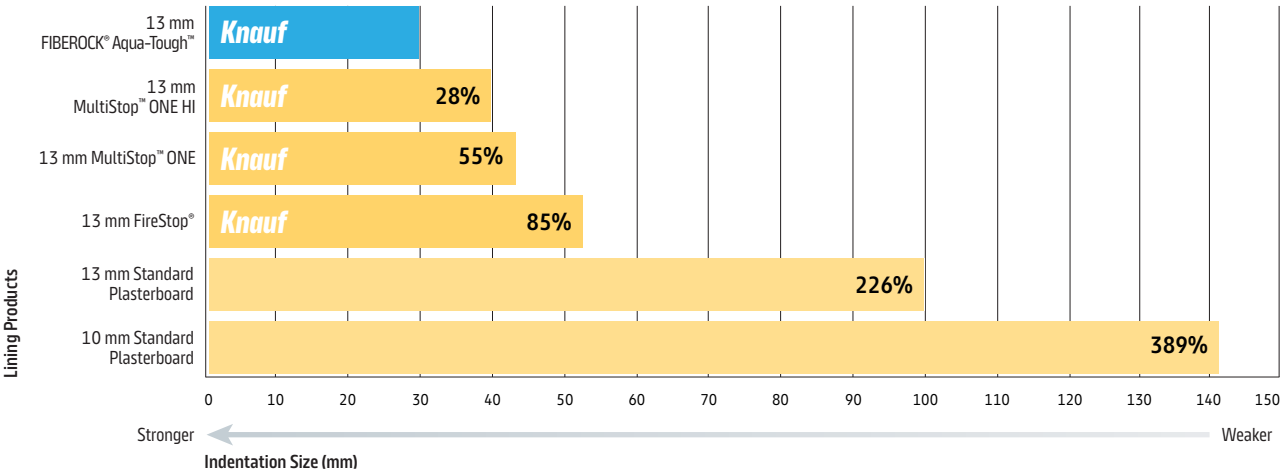
Figures 6 and 7 demonstrate the hard body impact performance of various plasterboard products available in the Australian market, with FIBEROCK Aqua-Tough clearly emerging as the standout leader in hard body impact resistance.

Figure 6: Depth of Surface Indentation for Hard Body Impact



*Percentages increase based on indentation depth relative to 13 mm FIBEROCK Aqua-Tough.

Figure 7: Size of Surface Indentation for Hard Body Impact



*Percentages increase based on indentation depth relative to 13 mm FIBEROCK Aqua-Tough.

DESIGN CONSIDERATIONS CONT.

Steel Frame Soft Body Impact

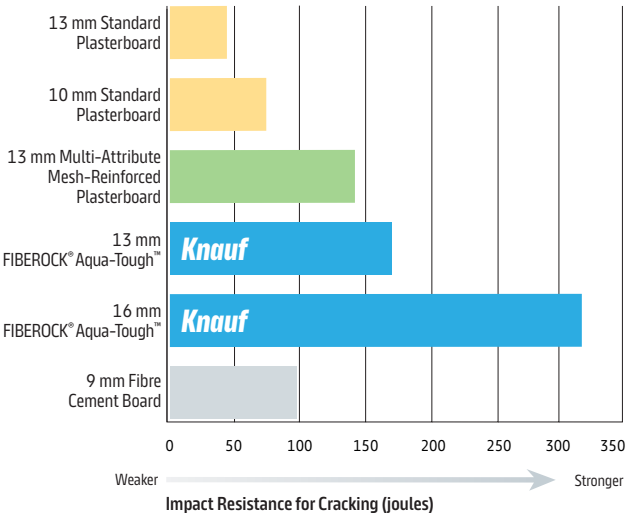
In addition to meeting NCC structural requirements, FIBEROCK Aqua-Tough outperforms other tested interior linings when used in steel frame wall systems, particularly in terms of joint durability. For this test, performance was assessed under soft body impact conditions, where impacts were repeated with increasing energy levels until failure was observed. Three specimens of each material were tested, with the lowest result being reported. Two critical failure points were identified:

- **First surface cracking**: This occurs when visual damage to the wall becomes evident, indicating that the performance of the lining is likely impaired in terms of resisting further impacts. Repairs would be necessary at this stage.
- **Penetration**: This occurs when the lining material is fully penetrated by the impact object. At this point, repairs would typically become more complex and expensive.

Soft body impact testing, conducted according to ASTM E695-03, simulates human body impacts by swinging a 27.2 kg sandbag from a drop height of 150 mm into a wall segment. The test measures the deflection or impact energy at which failure, such as cracking or penetration, occurs.

Figure 7 illustrates the lowest recorded impact energy for each lining type from the tests conducted.

Figure 8: First surface Cracking, Soft Body, Steel Frame



Finishing

FIBEROCK Aqua-Tough is the ideal substrate for use beneath all typical modern wall finishing materials, allowing a single internal lining material to be utilised across the site. Its specific advantages as a substrate for jointing and selected finishing materials include the following:

Jointing

FIBEROCK Aqua-Tough is jointed in the same manner as Knauf plasterboard, using paper tape and Knauf jointing compounds. These should be selected based on personal preference and experience while ensuring a high safety profile. Since all edges of FIBEROCK Aqua-Tough feature a recessed edge profile or can be site-recessed, there is no need for difficult or potentially unsightly raised surface butt joints.

Paint

FIBEROCK Aqua-Tough is ideal for use with high-quality paint finishes. These should be applied in accordance with the paint manufacturer's recommendations for plasterboard, with a pigmented oil-based sealer or equivalent recommended for areas exposed to moisture. Backrolling (using a 'dry' roller) should be performed after the application of the first coat of paint, whether applied by spray or roller.

By using FIBEROCK Aqua-Tough as a substrate, a superior quality finish can be achieved due to stronger joints that resist cracking and the absence of raised surface butt joints. The superior finish is further enhanced by the pre-sealed surface, which ensures even paint suction across the sheet. Additionally, the stiffness of FIBEROCK Aqua-Tough helps minimise out-of-plane areas in the wall caused by minor variations in stud alignment.

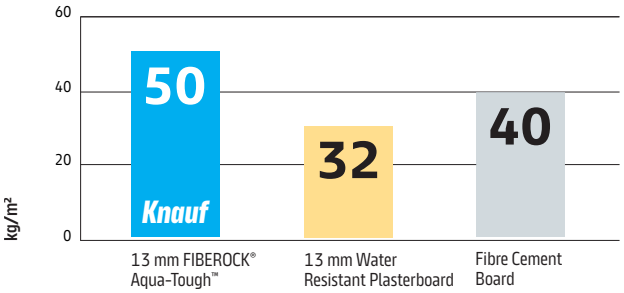
DESIGN CONSIDERATIONS CONT.

Tile

FIBEROCK Aqua-Tough's surface coating is optimised for the reliable bonding of tile adhesives and waterproof membranes, which are essential in areas exposed to direct water flow. With its homogenous structure, FIBEROCK Aqua-Tough has no surface paper to delaminate under moist conditions and offers excellent mould resistance to prevent potential mould growth beneath tiles.

Capable of supporting up to 50 kg/m² of tile weight, FIBEROCK Aqua-Tough is widely compatible with construction adhesives. However, good trade practices should always be followed, including testing all adhesives for compatibility prior to use.

Figure 9: Max Tile Weight at 600 mm Stud Centres



Wall Vinyl/Wall Paper

Apply to FIBEROCK Aqua-Tough in the same manner as plasterboard. During renovations, stripping wall vinyl or wallpaper from FIBEROCK Aqua-Tough is much easier compared to plasterboard, thanks to its paperless surface and factory pre-sealed properties.

Laminates/Lead

When special laminate surfaces, such as low-pressure melamine veneers or carpet, are desired for aesthetic or functional purposes, these materials can be reliably bonded to FIBEROCK Aqua-Tough. Additionally, FIBEROCK Aqua-Tough laminated with lead can be used to provide an effective barrier against X-ray radiation, particularly when the lead equivalence requirement exceeds the performance of products like GIB X-Block.

While FIBEROCK Aqua-Tough is widely compatible with construction adhesives, good trade practices should always be followed, including testing all adhesives for compatibility prior to use.

Design Made Simple With Knauf eTools

FIBEROCK Aqua-Tough is seamlessly integrated into Knauf's digital design suites, simplifying the design of wall and ceiling systems. These tools include:

- BIM WIZARD Revit
- BIM WIZARD ArchiCAD (for PC and Apple Mac)
- eSelector.

The BIM WIZARD Revit and ArchiCAD plug-ins eliminates the guesswork in selecting the right linings and product features for system design such as; fire resistance, acoustic and mould resistance, impact and water resistance.

For designers, the combination of FIBEROCK Aqua-Tough and Knauf eTools enhances efficiency by minimising the number of wall types and details, reducing errors, and ensuring up-to-date information throughout the design process.

Technical Resources

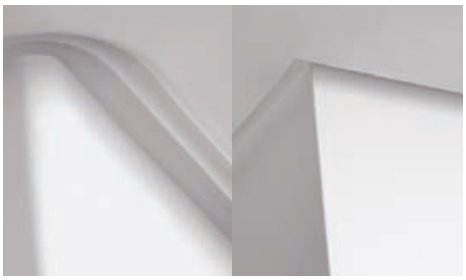
Plasterboard Installation Manual

CAD Library

Systems+

DESIGN CONSIDERATIONS CONT.

Design Creativity and Freedom



1 FIBEROCK Aqua-Tough can be adhesively bonded to itself to form contiguous voids or internal windows, with the edge being profiled or left square, achieving the look desired.

2 Negative edge details for ceilings, or ceiling elements are formed accurately, with either square, diagonal or curved edge treatment to complement other detailing in the room.

3 Alcoves become easy to form accurately with FIBEROCK Aqua-Tough for all components. Bond the edges at the back of alcove to the reverse face of the wall lining, and then rout (using sides as a guide) out the front lining to accurately form the desired corner profile.

Due to the composition of plasterboard, exposing the edge is typically not feasible because of the roughness at the interfaces between the paper surfaces and the gypsum core.

This is not the case with FIBEROCK Aqua-Tough, which can be easily worked on-site using standard woodworking tools. A variety of distinctive profiles can be achieved with routers or planes, unlocking creative possibilities for layered wall and ceiling effects. However, edge detailing requires precision machining and extra care during the finishing process.

FIBEROCK Aqua-Tough opens up a new realm of 3D (three-dimensional) surface treatments for interior designers. Walls are no longer confined to being rigidly flat; with this innovative material, they can feature details that were previously too challenging or impossible to achieve.

For example:

- A simple, site-formed groove at dado height or higher can draw the eye and create focus without disrupting a minimalist aesthetic
- Expansive surface profiling, such as vertical grooves that converge near a doorway or void, can introduce a sense of movement
- Patterns or curves can make bold personal design statements, create unique visual effects, or even align with a brand logo
- Surface profiles can visually connect spaces or define boundaries between them
- When a change is desired, the existing profile can be filled and left flat or replaced with a fresh surface treatment.

DESIGN CONSIDERATIONS CONT.

Hanging Wall Fixtures

Gone are the days of knocking on walls or ceilings to locate studs or settling for off-centre art placement due to stud positioning. With FIBEROCK Aqua-Tough, there's no need for hammer drills or the risk of damaging concrete or brick from imprecise workmanship.

FIBEROCK Aqua-Tough's high-density, homogenous core allows picture hooks and wall furniture to be screwed directly into the lining, regardless of stud location. The 13 mm lining can support up to 13 kg per screw at the screw head, while proprietary fasteners like the Hilti HHD-S can handle up to 120 kg in shear.

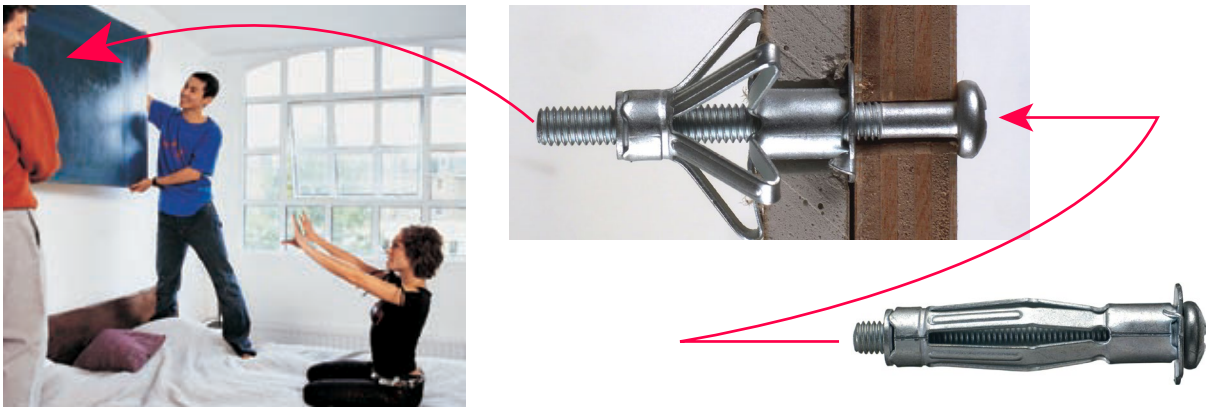
For optimal results, consult the framing supplier's engineer for design and installation details. Examples of suitable wall fixtures include:

- Dispensers: Liquids, gloves, masks, toilet paper, papertowels, antiseptic gels
- Nursing Stations: Defibrillators, sharps bins, diagnostic sets
- Boards and Signage: Whiteboards, pinboards, mirrors, artwork
- Other Fixtures: TV brackets, shelves, nightlights, reading lights, clocks.

Table 5: Hilti HHD-S Anchor Recommend Loads

Recommended Loads (kN)			N_{Rd} (Tensile Load)	V_{Rd} (Shear Load)
Hilti HHD-S Anchor	M4/12 x 38	13 mm Multi-Attribute Board Plasterboard	0.2	0.5
	M5/12 x 52		0.2	0.5
	M6/12 x 52		0.2	0.5
	M8/12 x 54		0.2	0.5
	M4/12 x 38	13 mm FIBEROCK Aqua-Tough	0.3	0.6
	M5/12 x 52		0.5	1.0
	M6/12 x 52		0.3	1.0
	M8/12 x 54		0.6	1.2

Figure 10: Wall Fixing with Hilti HHD-S Anchor



Hang what you want, where you want it with the use of a Hilti fastener.
Image source: hilti.com.au.

DESIGN CONSIDERATIONS CONT.

Sustainability

FIBEROCK Aqua-Tough contains very low levels of formaldehyde and Volatile Organic Compounds (VOCs). In fact, FIBEROCK Aqua-Tough has been tested to achieve formaldehyde and TVOC emission rates that are 10 times lower and more than 50 times lower, respectively, than the Green Star (Green Building Council of Australia) emission rate limits.

In addition to containing 95% recycled content, FIBEROCK Aqua-Tough is certified by Good Environmental Choice Australia (GECA) and may contribute to Green Star credits when assessed under various Green Star rating tools.

Low Embodied Energy

The embodied energy of FIBEROCK Aqua-Tough is approximately 5.5 MJ/kg, comparing favourably with other construction materials. Its durability, low maintenance properties, and ability to be designed for demounting and reuse at the end of a building's design life significantly reduce its impact on embodied energy.

This impact is further minimised by FIBEROCK Aqua-Tough's exceptionally high recycled content and its ability to be recycled into soil conditioners for agriculture and civil works.

Table 6: Embodied Energy of Linings Materials

Material	PER* Embodied Energy MJ/kg
Plasterboard	4.4
FIBEROCK Aqua-Tough	5.5
Plywood	10.4
Fibre cement	4.8
MDF	11.3
Hardboard	24.2

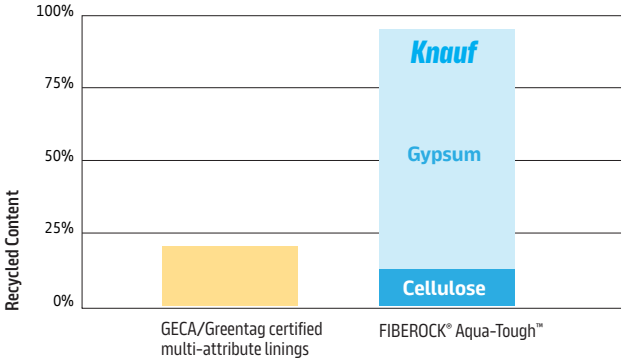
* PER - Process Energy Requirement.

Outstanding Recycled Content

FIBEROCK Aqua-Tough sets the benchmark in the market for recycled content, with an outstanding 95% composition derived from recycled materials. The raw materials used in the manufacture of FIBEROCK Aqua-Tough are sourced from external waste streams from other industries:

- 85% is post-industrial gypsum, a waste product obtained from an electricity generator. This eliminates the need for open-cast or underground mining of gypsum in the production of FIBEROCK Aqua-Tough linings
- 10% is recycled cellulose, ensuring that no trees are harvested for the manufacture of FIBEROCK Aqua-Tough linings.

Figure 11: Recycled Content of Gypsum Board in Australia



Minimisation of Site Waste

Using FIBEROCK Aqua-Tough interior linings can significantly reduce site waste. This is due to its ability to reuse off-cuts during installation by machining additional recessed edges into the off-cuts as needed.

In contrast, with plasterboard, up to 10% of the purchased material typically goes unused, depending on wall design. This is because most plasterboard off-cuts lack recessed edges, making them unsuitable for use as lining material on subsequent wall sections.

While some fibre cement off-cuts can theoretically be recessed on-site for reuse, the material's abrasiveness and adverse dust characteristics make this process impractical. As a result, high levels of waste often end up in landfill.

Demountable and Reusable

FIBEROCK Aqua-Tough linings can be demounted and recovered during demolition, allowing them to be reused in another structure. This is typically not possible with plasterboard or fibre cement, as the original recessed edges in these materials cannot be realistically cleaned of jointing compounds. In contrast, FIBEROCK Aqua-Tough linings can have new recessed edges machined in after demounting, making reuse a practical and sustainable option.

DESIGN CONSIDERATIONS CONT.

Ease of Installation

As part of the design process, it is important to consider how products will be managed and installed on-site by contractors and builders.

- **FIBEROCK Aqua-Tough** and its associated systems are designed with the installer in mind, requiring no specialist contractors, tools, or accessories for installation. FIBEROCK "goes up like plasterboard," using the same installation techniques and sequencing
- **Simplified ordering**: Only one product to order from Knauf
- **Improved coordination**: One board on-site for better coordination and to minimise installation errors
- **Easy to cut**: Utilises a simple score-and-snap method
- **No cutting rooms required**: Cutting can be done on-site without the need for dedicated cutting areas
- **No pre-drilling required**: Conventional gypsum screws can be used
- **Simple jointing**: Use paper tape and plasterboard jointing compounds for setting joints
- **Control joints**: Required at 12.0 m centres internally for walls and ceilings, and 6.0 m centres externally for ceilings
- **Seamless compatibility**: Works with FIBEROCK Aqua-Tough /plasterboard junctions without the need for expansion or control joints
- **Minimal waste**: Off-cuts can be rebated to form recessed edges and installed like normal plasterboard
- **Error reduction**: Only one product is installed for multiple applications, simplifying the process and reducing mistakes

Figure 12: FIBEROCK Aqua-Tough and Plasterboard Setting Joints

Notes

The image provided is a mock-up created for reference purposes only. It is intended to illustrate the jointing of Knauf plasterboard and FIBEROCK Aqua-Tough. For guidance specific applications of FIBEROCK Aqua-Tough, please consult a Knauf representative.

SYSTEMS

Table 7: System SBF30.1

Fire Resistance Level
NLB -/30/30
LB 30/30/30
From both sides

FRL Basis: FC18262

System Description

Side 1: 1 x 13 mm FIBEROCK Aqua-Tough.

Framing: Steel Studs.

Insulation: Refer to table.

Side 2: 1 x 13 mm FIBEROCK Aqua-Tough

Acoustic Ratings Basis: SLR-FB-S-S-01 — Based on studs at 600 mm ctrs and thinnest available stud gauge

System	Lining Side 1	Lining Side 2	Nom Wall Width (mm)	77	90	102	118	176
			Stud Size (mm)	51	64	76	92	150
			Insulation*	$R_w(R_w+C_{tr})$				
SBF30.1A	1 x 13 mm FIBEROCK Aqua-Tough	1 x 13 mm FIBEROCK Aqua-Tough	Nil	38(31)	39(31)	40(32)	41(33)	41(34)
			KI 50G11	41(35)	42(36)	43(37)	46(39)	46(41)
			KI 75G11	-	-	46(39)	47(41)	47(42)
			KI 90G11	-	-	-	48(41)	48(42)

* KI 50G11 – 50 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 75G11 – 75 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 90G11 – 90 mm Knauf Insulation Glasswool 11 kg/m³ density.

Max wall heights Non-load bearing walls* — Serviceability pressure: 0.25 kPa

Stud spacing (mm)		400					600				
Stud size (mm)		51	64	76	92	150	51	64	76	92	150
Base Metal Thickness (mm)	0.50	3510 d	4020 d	NA	NA	NA	3200 d	3720 d	NA	NA	NA
	0.55	NA	NA	4530 d	5330 d	NA	NA	NA	4130 d	4940 d	NA
	0.75	NA	4530 d	5450 d	6050 d	7610 2d	NA	4220 d	5020 d	5500 d	6990 2d
	1.15	NA	4810 d	5720 d	6380 d	8190 2d	NA	4430 d	5220 d	5750 d	7520 2d

Height Limiting Factor: d - deflection, 2d - deflection (2 rows of noggings).
* Refer Rondo for maximum heights for load bearing walls.

Table 8: System SBF30.2

Fire Resistance Level
NLB -/30/30
LB 30/30/30
From both sides

FRL Basis: FC18262

System Description

Side 1: 1 x 13 mm FIBEROCK Aqua-Tough

Framing: Steel Stud

Insulation: Refer to table

Side 2: 2 x 13 mm FIBEROCK Aqua-Tough

Acoustic Ratings Basis: SLR-FB-S-S-01 — Based on studs at 600 mm ctrs and thinnest available stud gauge

System	Lining Side 1	Lining Side 2	Nom Wall Width (mm)	90	103	115	131	189
			Stud Size (mm)	51	64	76	92	150
			Insulation*	$R_w(R_w+C_{tr})$				
SBF30.2A	1 x 13 mm FIBEROCK Aqua-Tough	2 x 13 mm FIBEROCK Aqua-Tough	Nil	41(33)	43(34)	44(35)	45(37)	46(38)
			KI 50G11	46(38)	46(39)	47(39)	49(42)	49(43)
			KI 75G11	-	-	50(41)	50(43)	50(43)
			KI 90G11	-	-	-	52(44)	52(45)

* KI 50G11 – 50 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 75G11 – 75 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 90G11 – 90 mm Knauf Insulation Glasswool 11 kg/m³ density.

Max wall heights Non-load bearing walls* — Serviceability pressure: 0.25 kPa

Stud spacing (mm)		400					600				
Stud size (mm)		51	64	76	92	150	51	64	76	92	150
Base Metal Thickness (mm)	0.50	3510 d	4020 d	NA	NA	NA	3200 d	3720 d	NA	NA	NA
	0.55	NA	NA	4530 d	5330 d	NA	NA	NA	4130 d	4940 d	NA
	0.75	NA	4530 d	5450 d	6050 d	7610 2d	NA	4220 d	5020 d	5500 d	6990 2d
	1.15	NA	4810 d	5720 d	6380 d	8190 2d	NA	4430 d	5220 d	5750 d	7520 2d

Height Limiting Factor: d - deflection, 2d - deflection (2 rows of noggings).
* Refer Rondo for maximum heights for load bearing walls.

SYSTEMS CONT.

Table 9: System SBF60.1

Fire Resistance Level
NLB -/60/60
LB 60/60/60
From both sides

FRL Basis: FC18262

System Description
Side 1: 1 x 16 mm FIBEROCK Aqua-Tough
Framing: Steel Studs
Insulation: Refer to table
Side 2: 1 x 16 mm FIBEROCK Aqua-Tough

Acoustic Ratings Basis: SLR-FB-S-S-01 — Based on studs at 600 mm ctrs and thinnest available stud gauge

System	Lining Side 1	Lining Side 2	Nom Wall Width (mm)	83	96	108	124	182
			Stud Size (mm)	51	64	76	92	150
			Insulation*	$R_w(R_w+C_{tr})$				
SBF60.1A	1 x 16 mm FIBEROCK Aqua-Tough	1 x 16 mm FIBEROCK Aqua-Tough	Nil	40(32)	41(33)	42(34)	43(35)	42(35)
			KI 50G11	45(37)	45(38)	46(40)	47(41)	47(42)
			KI 75G11	-	-	48(42)	48(42)	48(43)
			KI 90G11	-	-	-	49(43)	49(44)

* KI 50G11 – 50 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 75G11 – 75 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 90G11 – 90 mm Knauf Insulation Glasswool 11 kg/m³ density.

Max wall heights Non-load bearing walls* — Serviceability pressure: 0.25 kPa

Stud spacing (mm)		400					600				
Stud size (mm)		51	64	76	92	150	51	64	76	92	150
Base Metal Thickness (mm)	0.50	3620 d	4220 d	NA	NA	NA	3390 d	3910 d	NA	NA	NA
	0.55	NA	NA	4700 d	5560 d	NA	NA	NA	4300 d	5180 d	NA
	0.75	NA	4710 d	5710 d	6280 d	7750 2d	NA	4350 d	5260 d	5710 d	7190 2d
	1.15	NA	4950 d	5950 d	6580 d	8300 2d	NA	4520 d	5420 d	5930 d	7630 2d

Height Limiting Factor: d - deflection, 2d - deflection (2 rows of noggings).
* Refer Rondo for maximum heights for load bearing walls.

Table 10: System SBF90.1^

Fire Resistance Level
NLB -/90/90
From both sides

FRL Basis: FC18262

System Description
Side 1: 2 x 13 mm FIBEROCK Aqua-Tough
Framing: Steel Studs
Insulation: Refer to table
Side 2: 2 x 13 mm FIBEROCK Aqua-Tough

Acoustic Ratings Basis: SLR-FB-S-S-01 — Based on studs at 600 mm ctrs and thinnest available stud gauge

System	Lining Side 1	Lining Side 2	Nom Wall Width (mm)	103	116	128	144	202
			Stud Size (mm)	51	64	76	92	150
			Insulation*	$R_w(R_w+C_{tr})$				
SBF90.1A	2 x 13 mm FIBEROCK Aqua-Tough	2 x 13 mm FIBEROCK Aqua-Tough	Nil	-	48(36)	49(38)	-	-
			KI 50G11	-	51(41)	51(41)	-	-
			KI 75G11	-	-	53(42)	-	-
			KI 90G11	-	-	-	-	-

* KI 50G11 – 50 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 75G11 – 75 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 90G11 – 90 mm Knauf Insulation Glasswool 11 kg/m3 density.

Max wall heights Non-load bearing walls* — Serviceability pressure: 0.25 kPa

Stud spacing (mm)		400					600				
Stud size (mm)		51	64	76	92	150	51	64	76	92	150
Base Metal Thickness (mm)	0.50	NA	4020 d	NA	NA	NA	NA	3720 d	NA	NA	NA
	0.55	NA	NA	4530 d	NA	NA	NA	NA	4130 d	NA	NA
	0.75	NA	4530 d	5450 d	NA	NA	NA	4220 d	5020 d	NA	NA
	1.15	NA	4810 d	5720 d	NA	NA	NA	4430 d	5220 d	NA	NA

Height Limiting Factor: d - deflection.
^ System SBF90.1 must utilise 64 mm or 76 mm studs only.

SYSTEMS CONT.

Table 11: System SBF120.1^

Fire Resistance Level
NLB -/120/120
From both sides

FRL Basis: FC18262

System Description
Side 1: 2 x 13 mm FIBEROCK Aqua-Tough
Framing: Steel Studs
Insulation: Refer to table
Side 2: 2 x 13 mm FIBEROCK Aqua-Tough

Acoustic Ratings Basis: SLR-FB-S-S-01 — Based on studs at 600 mm ctrs and thinnest available stud gauge

System	Lining Side 1	Lining Side 2	Nom Wall Width (mm)	103	116	128	144	202
			Stud Size (mm)	51	64	76	92	150
			Insulation*	$R_w(R_w+C_{tr})$				
SBF120.1A	2 x 13 mm FIBEROCK Aqua-Tough	2 x 13 mm FIBEROCK Aqua-Tough	Nil	-	-	-	50(40)	50(41)
			KI 50G11	-	-	-	52(43)	52(45)
			KI 75G11	-	-	-	54(44)	53(46)
			KI 90G11	-	-	-	55(45)	55(47)

* KI 50G11 – 50 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 75G11 – 75 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 90G11 – 90 mm Knauf Insulation Glasswool 11 kg/m³ density.

Max wall heights Non-load bearing walls — Serviceability pressure: 0.25 kPa

Stud spacing (mm)		400					600				
Stud size (mm)		51	64	76	92	150	51	64	76	92	150
Base Metal Thickness (mm)	0.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	0.55	NA	NA	NA	4600 d	NA	NA	NA	NA	4600 d	NA
	0.75	NA	NA	NA	4700 d	6700 d	NA	NA	NA	4700 d	6700 d
	1.15	NA	NA	NA	5200 d	7700 d	NA	NA	NA	5200 d	7520 2d

Height Limiting Factor: d - deflection, 2d - deflection (2 rows of noggings).
^ System SBF120.1 must utilise 92 mm or 150 mm studs only.

Table 12: System SBF120.2

Fire Resistance Level
NLB -/120/120
From both sides

FRL Basis: FC18262

System Description
Side 1: 2 x 16 mm FIBEROCK Aqua-Tough
Framing: Steel Studs
Insulation: Refer to table
Side 2: 2 x 16 mm FIBEROCK Aqua-Tough

Acoustic Ratings Basis: SLR-FB-S-S-01 — Based on studs at 600 mm ctrs and thinnest available stud gauge

System	Lining Side 1	Lining Side 2	Nom Wall Width (mm)	115	128	140	156	214
			Stud Size (mm)	51	64	76	92	150
			Insulation*	$R_w(R_w+C_{tr})$				
SBF120.2A	2 x 16 mm FIBEROCK Aqua-Tough	2 x 16 mm FIBEROCK Aqua-Tough	Nil	49(37)	50(39)	51(41)	51(42)	50(42)
			KI 50G11	51(43)	52(44)	53(45)	53(46)	52(46)
			KI 75G11	-	-	54(47)	54(48)	53(48)
			KI 90G11	-	-	-	55(49)	54(49)

* KI 50G11 – 50 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 75G11 – 75 mm Knauf Insulation Glasswool 11 kg/m³ density.
KI 90G11 – 90 mm Knauf Insulation Glasswool 11 kg/m³ density.

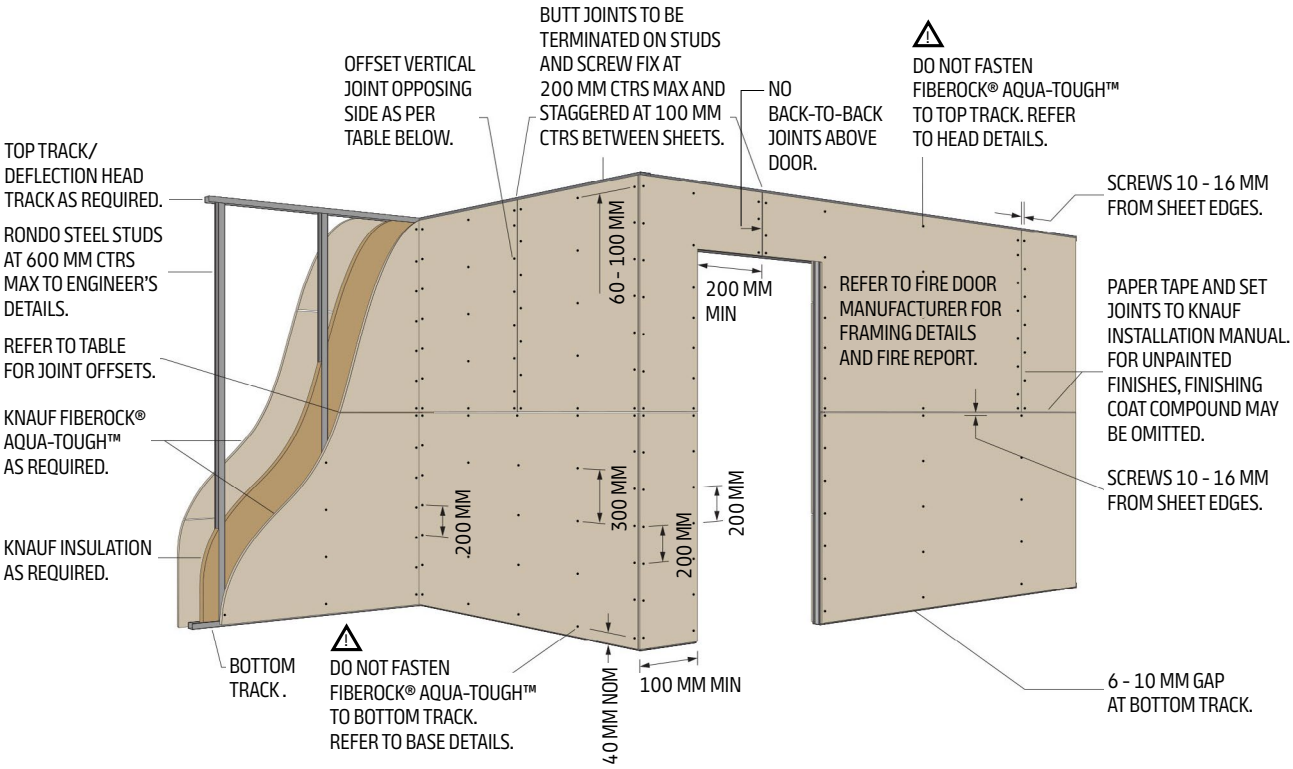
Max wall heights Non-load bearing walls — Serviceability pressure: 0.25 kPa

Stud spacing (mm)		400					600				
Stud size (mm)		51	64	76	92	150	51	64	76	92	150
Base Metal Thickness (mm)	0.50	3620 d	4220 d	NA	NA	NA	3390 d	3910 d	NA	NA	NA
	0.55	NA	NA	4700 d	5560 d	NA	NA	NA	4300 d	5180 d	NA
	0.75	NA	4710 d	5710 d	6280 d	7750 2d	NA	4350 d	5260 d	5710 d	7190 2d
	1.15	NA	4950 d	5950 d	6580 d	8300 2d	NA	4520 d	5420 d	5930 d	7630 2d

Height Limiting Factor: d - deflection, 2d - deflection (2 rows of noggings).

INSTALLATION DETAILS

Figure 13: Fire Rated-Steel Stud Wall - Horizontal Sheet Installation - Single Layer

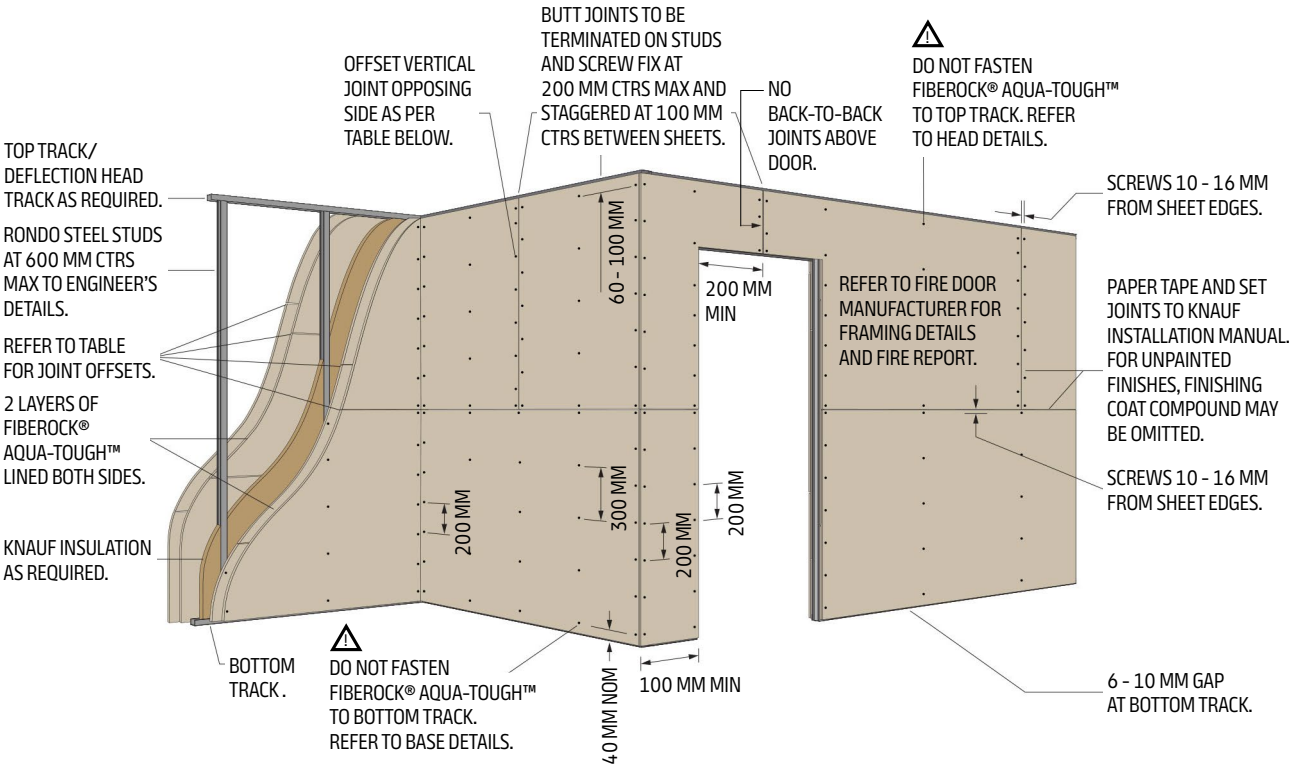


Min Joints Offsets (mm)		
Lining Layer	**Vertical Joints (One Stud Spacing)**	**Horizontal Joints**
Inner/single layers on opposite sides	300 min	300

Max Screw Spacing (mm)			
Lining Layer	**Intermediate Studs**	**Vertical Edges**	**Int/Ext Corners and Around Openings**
Outer/single layer	300	200 (stagger screws in abutting sheets)	200

INSTALLATION DETAILS CONT.

Figure 14: Fire Rated-Steel Stud Wall - Horizontal Sheet Installation - Double Layer



Min Joints Offsets (mm)		
Lining Layer	**Vertical Joints (One Stud Spacing)**	**Horizontal Joints**
Inner/single layers on opposite sides	300	300
Adjacent layers on same side	300	300

Max Screw Spacing (mm)			
Lining Layer	**Intermediate Studs**	**Vertical Edges**	**Int/Ext Corners and Around Openings**
Outer/single layer	300	200 (stagger screws in abutting sheets)	200
Inner layer	600	600	600

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