

Ceilings & Floors

FirePro® / FP®-Steel
FP®-900 / FirePro-S®

FIRE RESISTING CONSTRUCTIONS
Solutions & Technical Manual



SOBEN INTERNATIONAL

High Performance Building Boards & Solutions for Sustainable Construction



Building With Confidence

A new benchmark for eco-friendly autoclaved cellulose fibre reinforced silicate matrix boards

Few versatile performance building boards offer both architectural envelope and strong technical specification as credible as the Soben International premium product range of eco-friendly autoclaved cellulose fibre reinforced silicate matrix boards. The line includes: fire protection calcium silicate boards, weather resistant fibre-cement boards and prefabricated panels. Since its establishment, Soben International has been a pre-eminent developer and manufacturer of high quality eco-friendly silicate matrix board solutions and has set a new benchmark for comparable products made in Asia.

With extensive product research and testing, our areas of expertise are sophisticated building solutions that tackle fire protection, multi-purpose constructions, façades and claddings where aesthetic finish and quality are of paramount importance.

Soben International high performance boards have been fully tested and certified by first class accredited laboratories and third party certification bodies to testify our commitment to performance, delivery of quality, and health and safety.

STRIVING FOR QUALITY PRODUCTS & PROFESSIONAL EXCELLENCE

FIRE-SAFE

Soben International Boards are prime protectants against fire damage. The range's high levels of fire resistance has been thoroughly tested and certified by official European laboratories.

RELIABILITY

The Soben International team is dedicated to retaining an excellent Client Services department to ensure your needs are adhered to quickly and effectively.

Quality Control and Quality Assurance programmes are in place in all Soben International divisions to guarantee that all orders of our fully tested products and solutions follow their ISO 9001, 14001 and CE Mark standards.

Soben International's customer service team is tasked with the primary goal of providing punctual delivery of shipments and endeavour to ensure that upon receipt of goods, each client's requisition is accurate and truthful to the product description.

ETHICAL

Soben International places great onus on the preservation of good practice and professional conduct at all stages of the supply chain. This is upheld from the manufacturing process to the delivery of goods and throughout all communication with stakeholders and clientele.

ECO-FRIENDLY

Standing at the forefront of environmental innovation, Soben International is committed to sustaining and developing a commendable CSR record. Our solutions for eco building and sustainable development projects have all been certified by the appropriate Green Label authorities.

DISCLAIMER

Please ensure that you have the latest version of this publication by checking that the publication date corresponds with the downloadable version from our website www.sobenboard.com. In case of doubt, please contact your local Soben International representative.

All information contained in this brochure is, to the best of our knowledge, correct at the time of printing. Soben International shall be under no liability whatsoever any loss or damages which may arise as a result of the failure to adhere to such recommendations in all aspects. Nothings in these Conditions, nor any compendiums, brochures, instructions, method statements or other documents or designs issued by or on behalf of Soben International shall create or to be deemed to create any obligation.

Soben International has a policy of continuous improvement and reserves the right to change specifications, designs of products and systems at any time without prior notice. Local authority must be consulted for compliance with local building regulations.

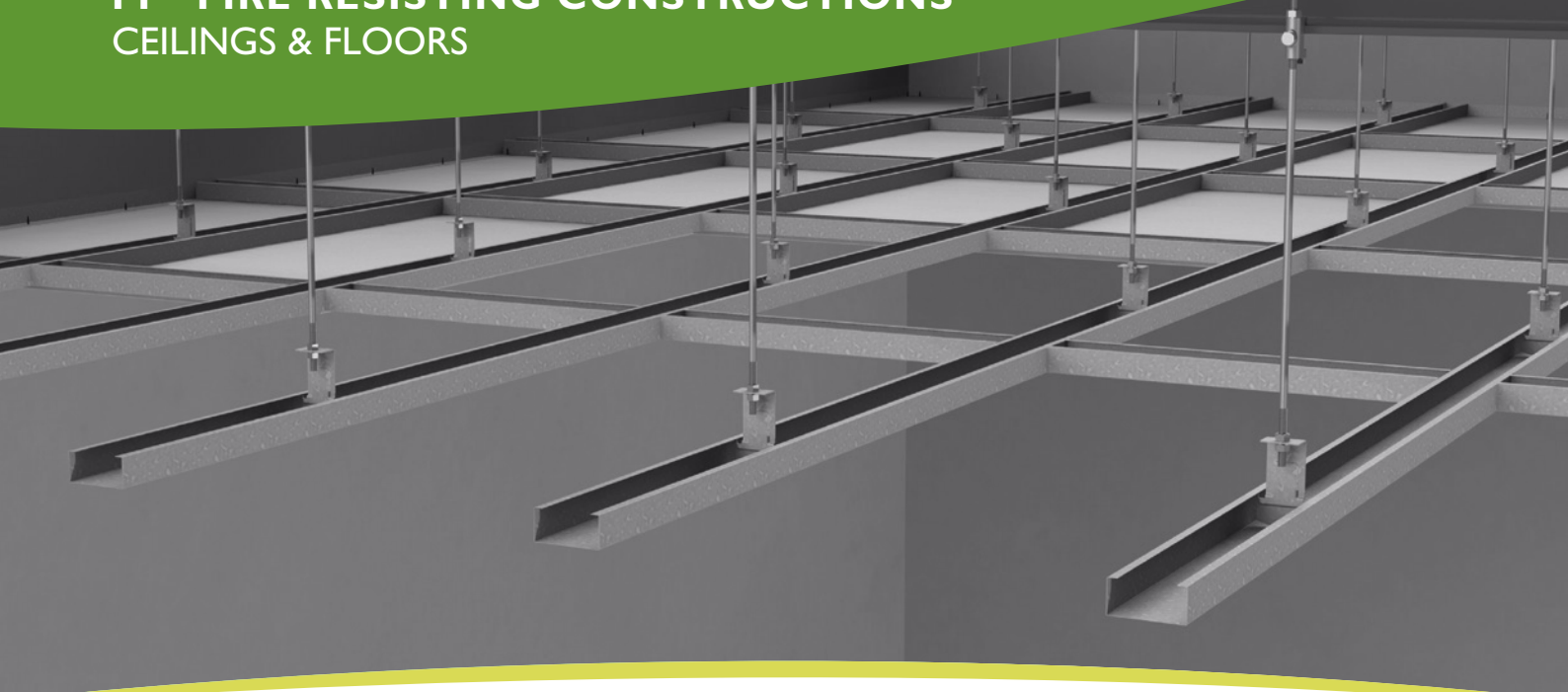
REGISTERED TRADE MARK

FP®-900, FP®-Steel, MP-1000® and NuPanel® are registered trade names for the products marketed in Europe

FirePro®, FP®-Steel, FirePro®-S, MultiPro®, and NuClad® are registered trade names for the products marketed in Asia.



FP® FIRE RESISTING CONSTRUCTIONS CEILINGS & FLOORS



CONTENTS

FP® Fire Resisting Construction	General Specification	01
<hr/>		
FP® -900/FirePro®		
Suspended Ceiling Membrane	Ceiling Framework	03
	Suspended Ceiling Membrane Protecting Steel Beam	08
	Suspended Ceiling Membrane	11
Self-supporting Ceiling Membrane	Ceiling Framework	14
	Self-supporting Ceiling Membrane – Type 1	22
	Self-supporting Ceiling Membrane – Type 2	23
	Self-supporting Ceiling Membrane – Type 3	24
Ceiling Membranes	Ceiling Details	25
<hr/>		
FP® -Steel/FirePro®-S		
Loadbearing Floor	Loadbearing Floor – Type 1	27
	Loadbearing Floor – Type 2	29
Suspended Ceiling Membrane		32
Self-suspended Ceiling Membrane		34
Ceilings & Floors	Ceiling & Floor Details	35

CONSIDERATIONS FOR FP® FIRE RATED CEILING MEMBRANE AND FLOOR ASSEMBLIES

Supporting Construction

A FP® fire rated ceiling membrane or floor assembly is supported from appropriate masonry/concrete or steel constructions that have a fire resistance of at least that specified for the ceiling membrane or floor and are capable of providing adequate support to the construction for the required period of fire resistance.

Steel Support Members

Minimum yield stress for a steel supporting grid and other support members should be 275N/mm² at room temperature. The supporting grid framework can be constructed with cold form steel channels or hollow sections provided that the section modulus of steel members is not less than the specified. The cold form channels should have minimum 50mm web width.

Steel Joists for Self-supporting ceiling

Self-supporting steel joists for a ceiling membrane are supported at two ends of perimeter members fastened to masonry/concrete or steel constructions. An allowance for expansion of nominally 5mm/m is provided, either at one end or both ends of the joists should be provided.

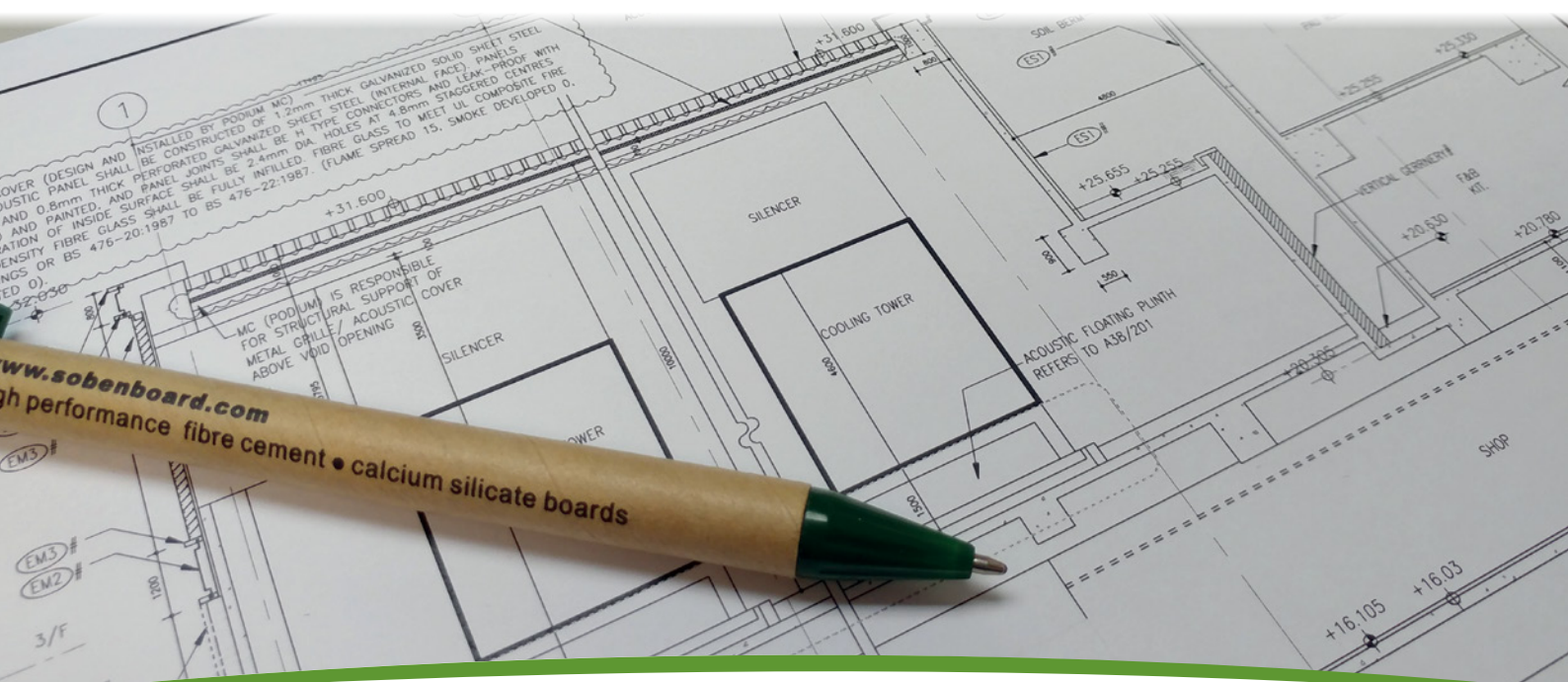
Drop Rods/angles

A FP® fire rated suspended ceiling membrane assembly is supported by threaded drop rods/steel angles connected to the ceiling steel supporting grid members. The spacing and size of drop rods/steel angles must be adjusted so that the tensile stress in the rods/angles does not exceed the stress to respective fire ratings. The fixings used to fasten the threaded rod to concrete soffits must be all-steel expanding anchors with a penetration in the concrete of minimum depth to respective fire ratings.

Fire rating- minutes	Stress limit- N/mm ²	Minimum depth of anchor - mm
60	15	40
120	10	50
180	8	60
240	6	60

Insulation

Stone wool insulation must be non-combustible to BS 476: Part 4 or equivalent; e.g. European Classification A1 of EN 13501-1. The thickness and density of stone wool are approved in each system. Alternative thicknesses and densities of stone wool insulation may be fitted provided that the weight per square metre is at least that specified as mentioned in test or assessment reports.



Vertical Return

Provision of vertical returns in the ceiling membrane systems, with a maximum height of 2.5m, up to a concrete soffit. The vertical return is formed by extending the ceiling membrane vertically with the same basic construction as for the main part of the ceiling. The weight of the vertical return is taken by the concrete floor above by means of the steel grid framework.

Access Panel

Inclusion of an access panel, with a maximum size of 1220mm x 610mm for FP®-900/FirePro® ceilings and 1200mm x 1200mm for FP®-Steel/FirePro®-S for ceilings. The construction of the panel follows that of the ceiling membrane system. The perimeter of the access panel is fitted with a steel angle. The panel is fastened to the surrounding steel channel framework through the angles with steel self-tapping screws at 200mm maximum centres. The access panel must not interrupt the grid supporting members.

Recess for Light Fittings

Inclusion of a recess for light fittings, with a maximum size of 1220mm x 610mm for FP®-900/FirePro® ceilings, and 1200mm x 1200mm for FP®-Steel/FirePro®-S for ceilings. The recess is formed by extending the ceiling membrane vertically and horizontally with the same basic construction as for the main part of the ceiling. The recess must not interrupt the grid supporting members. The light fittings are independently supported so that no additional loads are imposed on the ceilings. Any holes drilled in the recesses for supports or electrical cables must be no more than a few millimetres larger than the support or cable and sealed with a fire rated mastic for the full depth of the FP® boards.

Sprinkler Pipe

Penetration of the ceiling by sprinkler pipes, The pipes must be made of steel with a diameter not exceeding 40mm. The pipes must be independently supported so that their weight is not taken by the ceiling. The hole drilled through the ceiling for the pipe must be no more than a few millimetres larger than the pipe and sealed with a fire rated mastic for the full depth of the FP® fire protection boards.

Movement Joint

A movement joint is needed on a ceiling membrane when it spans a building movement control joints. The movement joints should be sealed with fire rated sealant. The sealant should be silicone based and tested in accordance with BS 476: Part 20 or equivalent approval.

Acoustic Insulation

FP® ceiling membrane systems have been developed with specific airborne sound insulation. Higher level of insulation may be critical for individual projects, further information please contact Soben International.

Fire Above

Most of FP® ceiling membrane systems are designed to stop fire attack either from below and/or above. Fire exposure of a ceiling construction from above is generally regarded as less severe than fire exposure from below due to the heat flow and pressure characteristics within a fire compartment. However, it should be ensured that no heavy objects/debris could fall on the ceiling membrane assembly in a fire situation that could damage the ceiling construction.

Steel Fasteners

Size of self-tapping screws for fixing FP® fire protection boards to ceiling frameworks should have at least M3.5 for FP®-900/FirePro® ceilings and M5.5 for FP®-Steel/FirePro®-S ceilings. The steel screws should be coated for rust resistant. Stainless steel fasteners are recommended for the ceiling membrane installed at severe humid areas all the time.

Steel Anchors

Fixing steel profiles to perimeter wall constructions or drop rods to concrete floor slabs should use all steel type anchor and always follow manufacturer's instructions for steel anchors.

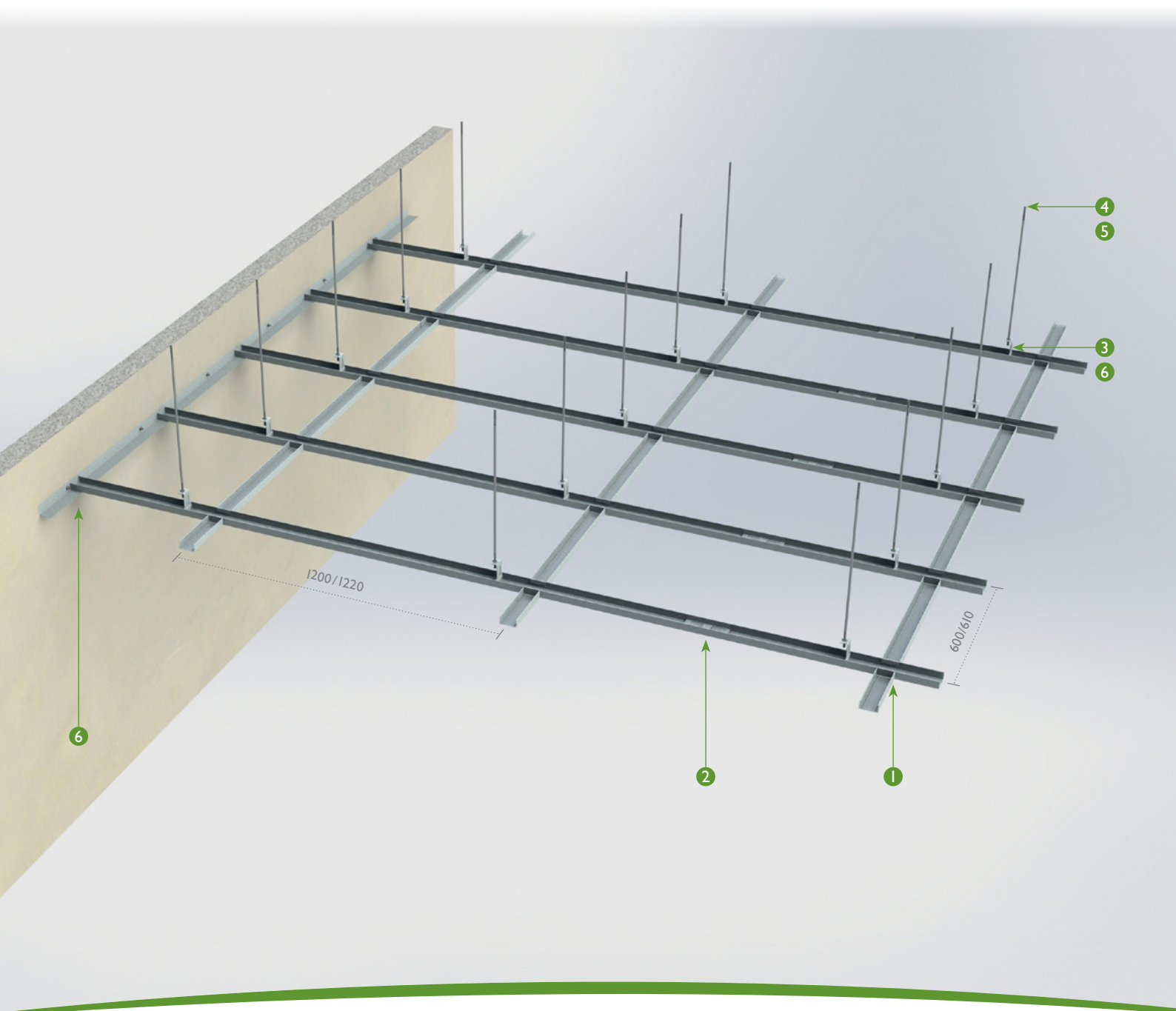
Fire Rated Sealant

Where FP® fire protection boards abutting perimeter wall constructions should be jointed tightly. In case the walls' surface are uneven, fire rated sealant should be applied to seal up any gaps at the perimeter walls. The sealant should be tested in accordance with BS 476: Part 20 or equivalent approval.

STEEL FRAME FOR FP®-900/FIREPRO® SUSPENDED CEILING MEMBRANE

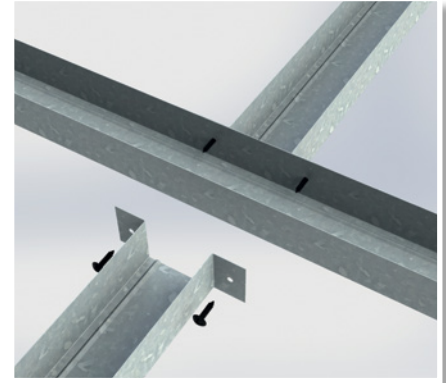
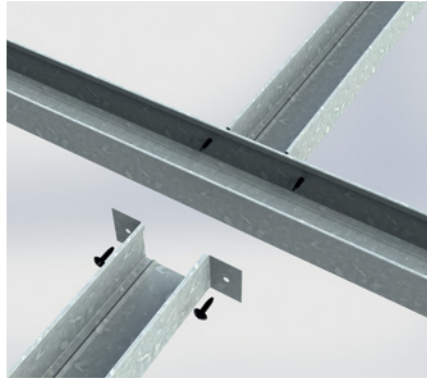
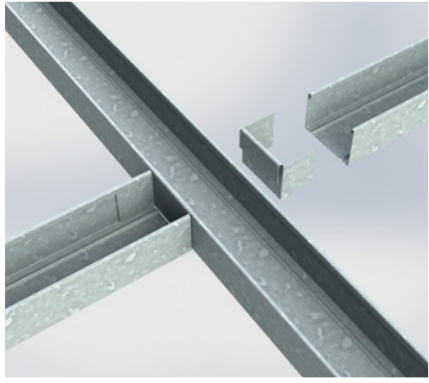
A FP®-900/FirePro® fire rated ceiling membrane system consists of a cold form steel channel framework with threaded drop rods or steel angle members suspended from a structural floor slab or roof above. The main channels run along the ceiling at maximum 610mm centres. Cross channels connect the main channels at maximum 1220mm centres. The FP®-900/FirePro® boards are fastened to the framework by M3.5 self-tapping screws. All board joints coincide with the main and cross channels.

Channels are made of cold form lipped channel or U-channel, applicable for the ceiling framework. The required size of channel is given in each system. Alternative thicknesses and sizes of steel channel may be fitted provided that the second moment of area of the channel is not less than the specified in each system. The web of channel should have at least 50mm in width.

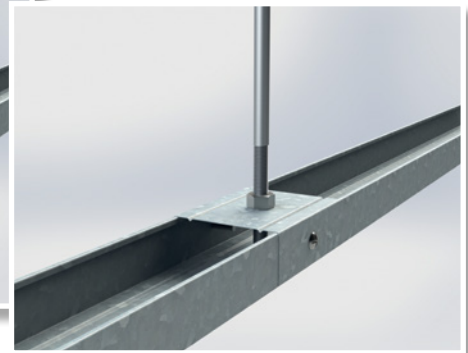
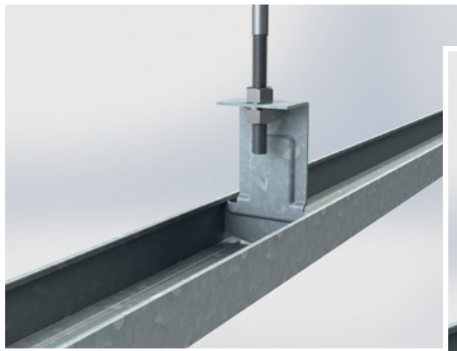
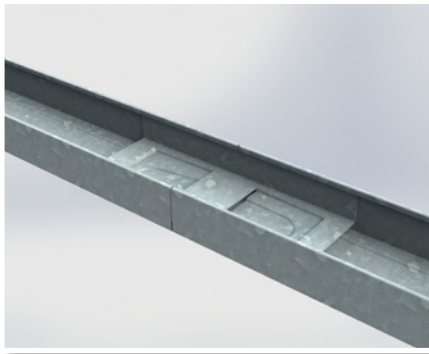


CONNECTION DETAILS

1 CROSS CONNECTION WITH CROSS CONNECTOR OR "CUT AND FOLDED" CROSS CHANNEL

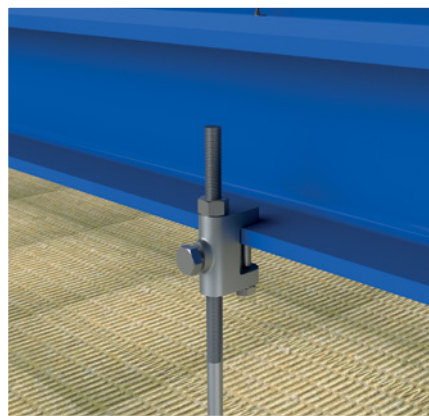


2 EXTENSION OF CHANNEL WITH CHANNEL CONNECTOR



3 DROP HANGER CONNECTION WITH PROPRIETARY CLIP OR U-CHANNEL

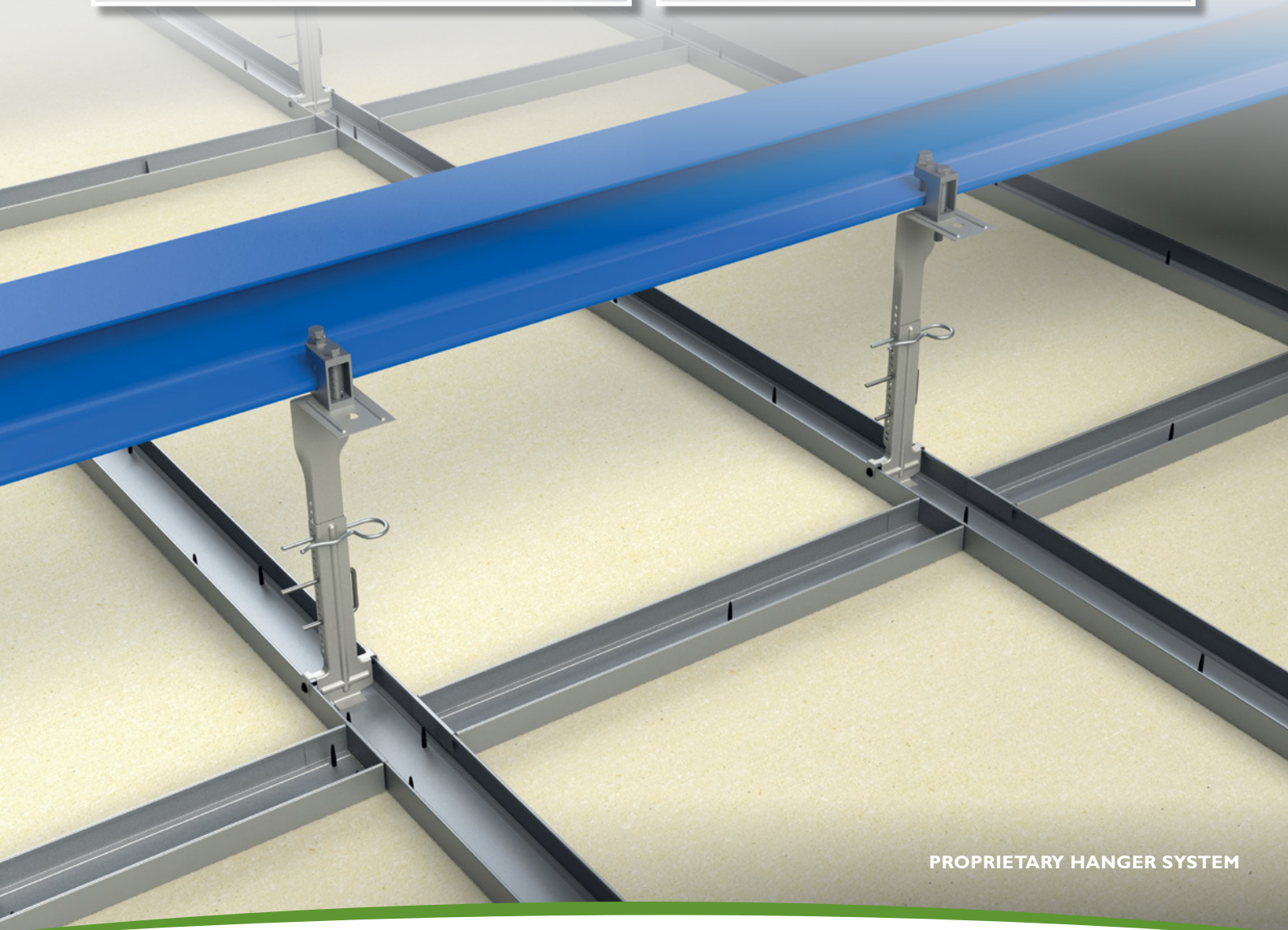
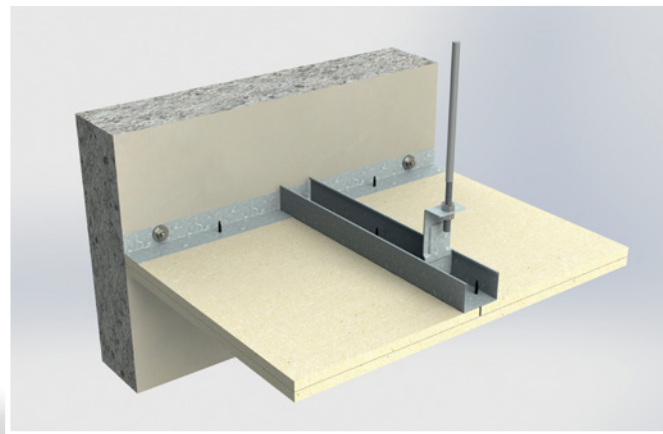
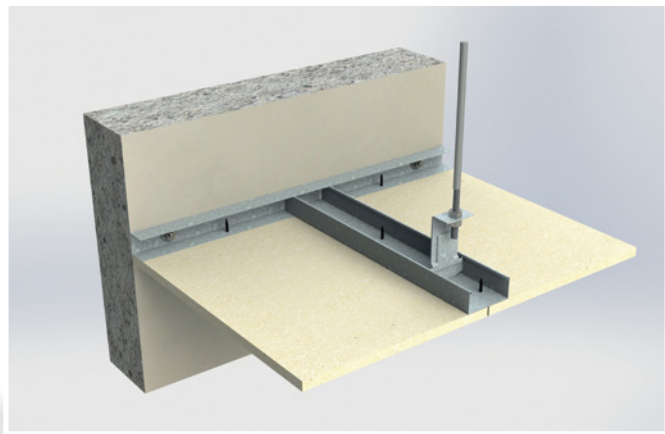
4 DROP ROD WITH CLIP ATTACHED TO STEEL BEAM



5 DROP ROD WITH STEEL ANCHOR FIXED TO CONCRETE SLAB



6 CEILING CHANNEL CONNECTION AT PERIMETER WALLS



PROPRIETARY HANGER SYSTEM

* Note: Proprietary hanger systems have been tested and certified suitably for FP®-900/FirePro® suspended ceiling membranes

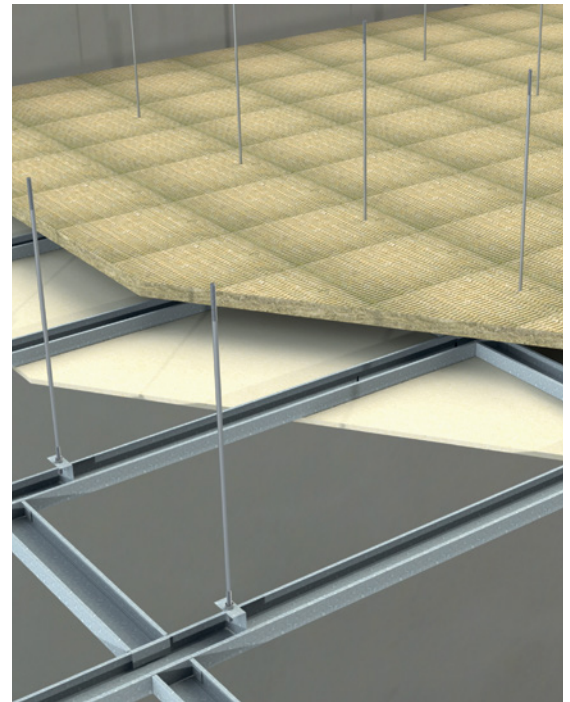
AN EXAMPLE FOR CALCULATING STEEL DROP ROD SUPPORTS

Given:

- Fire rating of the ceiling = 60 minutes
- Density of board = 990kg/m³ (with 10% allowance)
- Density of stone wool = 80kg/m³
- Density of steel = 7850kg/m³
- Steel drop rods spaced at 1220mm centres connected to main channels
- Main channels at 610mm centres
- Cross channels at 1220mm centres
- Maximum allowable steel stress ≤ 15N/mm² for 60 minutes of fire rating

Checking:

- 1 Maximum allowable load applied at the M6 steel drop rod = 15N/mm² × 20.10mm² = 301.5N
- 2 Total weight of FP®-900/FirePro® suspended ceiling membrane system for each section supported by a drop rod
 $W_T = W_1 + W_2 + W_3 + W_4 + W_5$
 $W_T = 111.9N \leq 301.5N$
- 3 So the steel drop rod with size M6 is acceptable.



WEIGHT OF CEILING ASSEMBLY

Component of Ceiling	Size	Weight - N	
FP®-900/FirePro® board	1220mm × 610mm × 9mm (length × width × thickness)	W ₁	65.0
Main channel	38 × 50 × 38 × 0.5mm thick at 610mm centre	W ₂	5.9
Cross channel	38 × 50 × 38 × 0.5mm thick at 1220mm centre	W ₃	3.0
Stone wool	1220mm × 610mm × 60mm (length × width × thickness)	W ₄	35.0
Miscellaneous	Metal connectors, self-tapping screws and paint	W ₅	3.0
		Total W _T	111.9

EFFECTIVE CROSS-SECTIONAL AREA OF STEEL DROP RODS

Threaded Drop Rod	Root Diameter -mm	Cross Sectional Area - mm ²
M6	5.06	20.10
M8	6.83	36.63
M10	8.60	58.08
M12	10.36	84.29
M14	12.25	117.85
M16	14.14	157.03

ALTERNATIVE SIZE AND SECTION FOR STEEL MEMBERS

Size or section of steel members specified for a framework in ceiling or floor systems may not be available in some countries. In this case alternative size and section may be fitted provided the minimum size of member in terms of second moment of area or section modulus should be at least that specified.

CALCULATION EXAMPLE

Given:

The required minimum section modulus for a ceiling channel = 6.15cm³

Proposed alternative:

Steel channel size = 100mm x 50mm x 1mm thick

Calculation of second moment of area about major axis x-x:

$$I_{x, \text{flange 1}} = \frac{50 \times 1^3}{12} + 50 \times 1 \times 49.5^2 = 122517\text{mm}^4$$

$$I_{x, \text{flange 2}} = \frac{50 \times 1^3}{12} + 50 \times 1 \times (-49.5)^2 = 122517\text{mm}^4$$

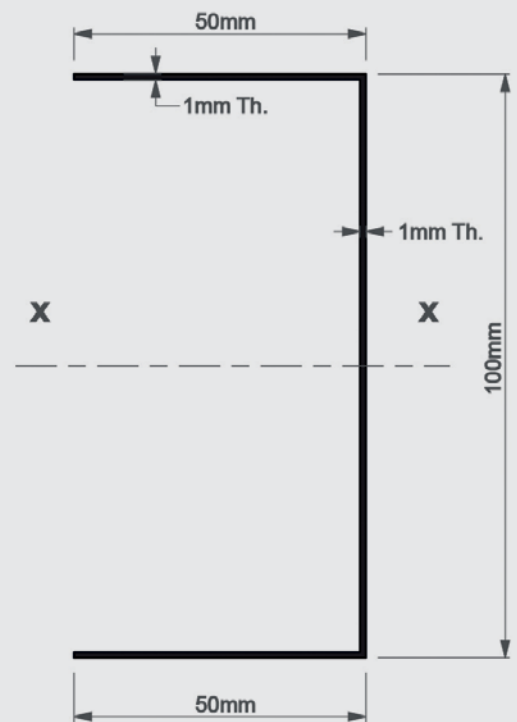
$$I_{x, \text{web}} = \frac{1 \times 98^3}{12} = 78433\text{mm}^4$$

$$I_{xx} = I_{x, \text{flange 1}} + I_{x, \text{web}} + I_{x, \text{flange 2}} = 323467\text{mm}^4$$

Calculation of section modulus about major axis x-x:

$$Z_{xx} = \frac{323467}{50} = 6469\text{mm}^3 = 6.47\text{cm}^3,$$

Z_{xx} is acceptable ≥ the given 6.15cm³



FP®-900/FirePro® Suspended Ceiling Membrane Protecting Steel beams FPCB 30/60/120/180



When a loadbearing concrete floor or roof slab is supported by steel beams exposed to fire. Strength of steel beams gradually decreases as heat temperature goes up. Eventually the loaded beams will collapse if they are not protected against fire. The structural floor should be protected by an adequate passive fire protection system, either the steel beams are encased with FP®-900/FirePro® boards in terms of BS 476: Part 21 mentioned in other part of this manual, or FP®-900/FirePro® suspended ceiling membrane is installed below the steel beams in terms of BS 476: Part 23 as described below.

SPECIFICATION

FP®-900/FirePro® suspended ceiling membranes for fire protection of steel beams have been tested and complied with BS 476: Part 23. The minimum requirements of ceiling assemblies for various fire resistance rating are given below.

Fire Rating - minutes	FP®-900/FirePro®	Stone Wool#		Steel Channels*	
		mm x kg/m ³	Kg/m ²	web x flanges x thickness - mm	2 nd moment of area ly-y mm ⁴
Stability / Integrity / Insulation	Thickness - mm				
30	9	-	-		
60	9	50 x 40	2.0	U - 50 x 38 x 0.5 or	6574
120	9	100 x 40	4.0	C - 60 x 27 x 0.6	
180	12	120 x 40	4.8		

* Note: The steel channel can be U or C channel provided it should not be less than the specified ly-y second moment of area of the channel.
Alternative thicknesses and densities of stone wool insulation may be fitted provided that the weight per square meter is at least that specified.



30 MINUTES FIRE RATING

FP®-900/FirePro® Suspended Ceiling Membrane Protecting Steel beams FPCB 30/60/120/180



FIRE RATING

FRL	Up to -/I80/I80
Standard	BS 476: Part 23: 1987
Approval	Exova WF324818 Fires-FR-169-17-AUNE

ACOUSTIC

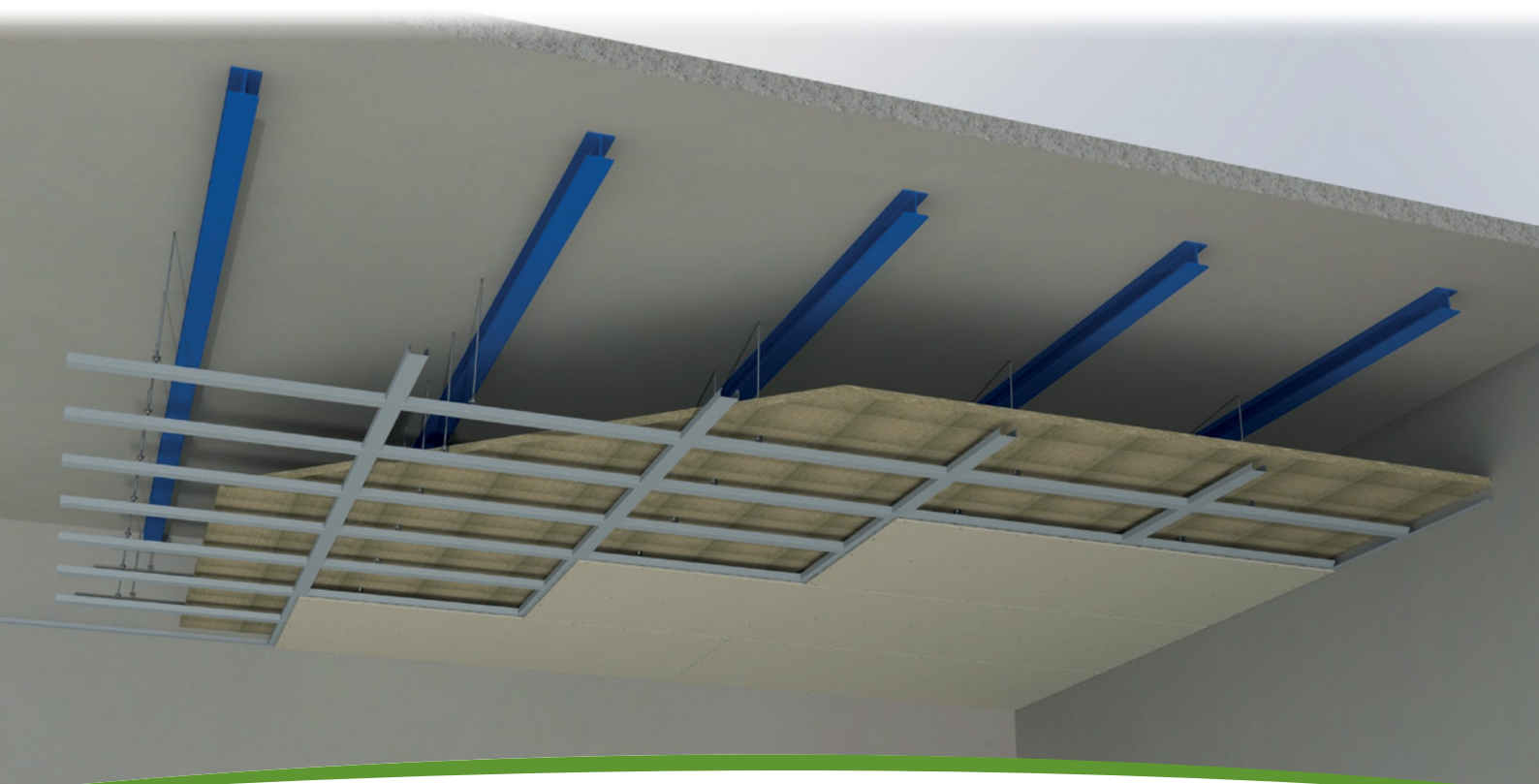
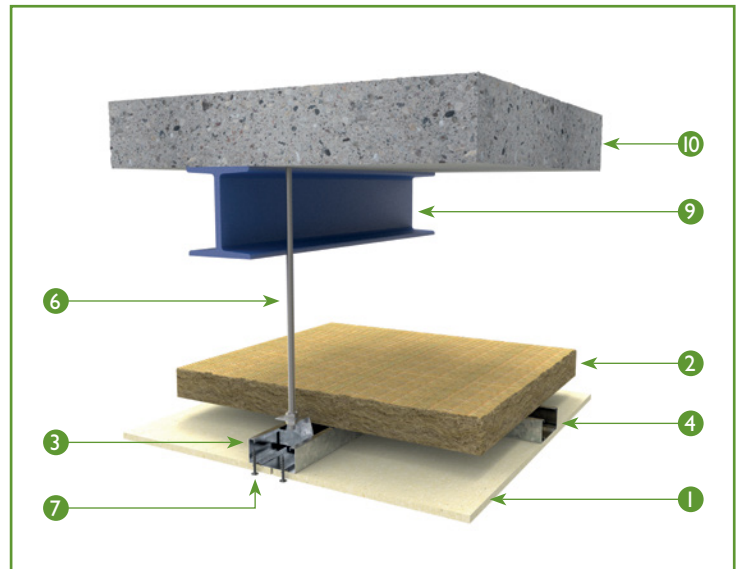
STC / Rw *	28dB up
Standard	EN ISO 10140-2:2010 EN ISO 717-1: 2013
Assessment	Marshall Day - INSUL

SYSTEM

Ceiling thickness	36mm up
Ceiling mass	10 kg/m ² up

* STC / Rw values within +/-3dB

Fire attack from below



INSTALLATION

FP®-900/FirePro® fire rated ceiling membrane should be constructed in accordance with the approved specification mentioned in the manufacturer's handbook & the local building regulation (if required).

FP®-900/FirePro® Suspended Ceiling Membrane Protecting Steel beams FPCB 30/60/120/180



TECHNICAL DATA

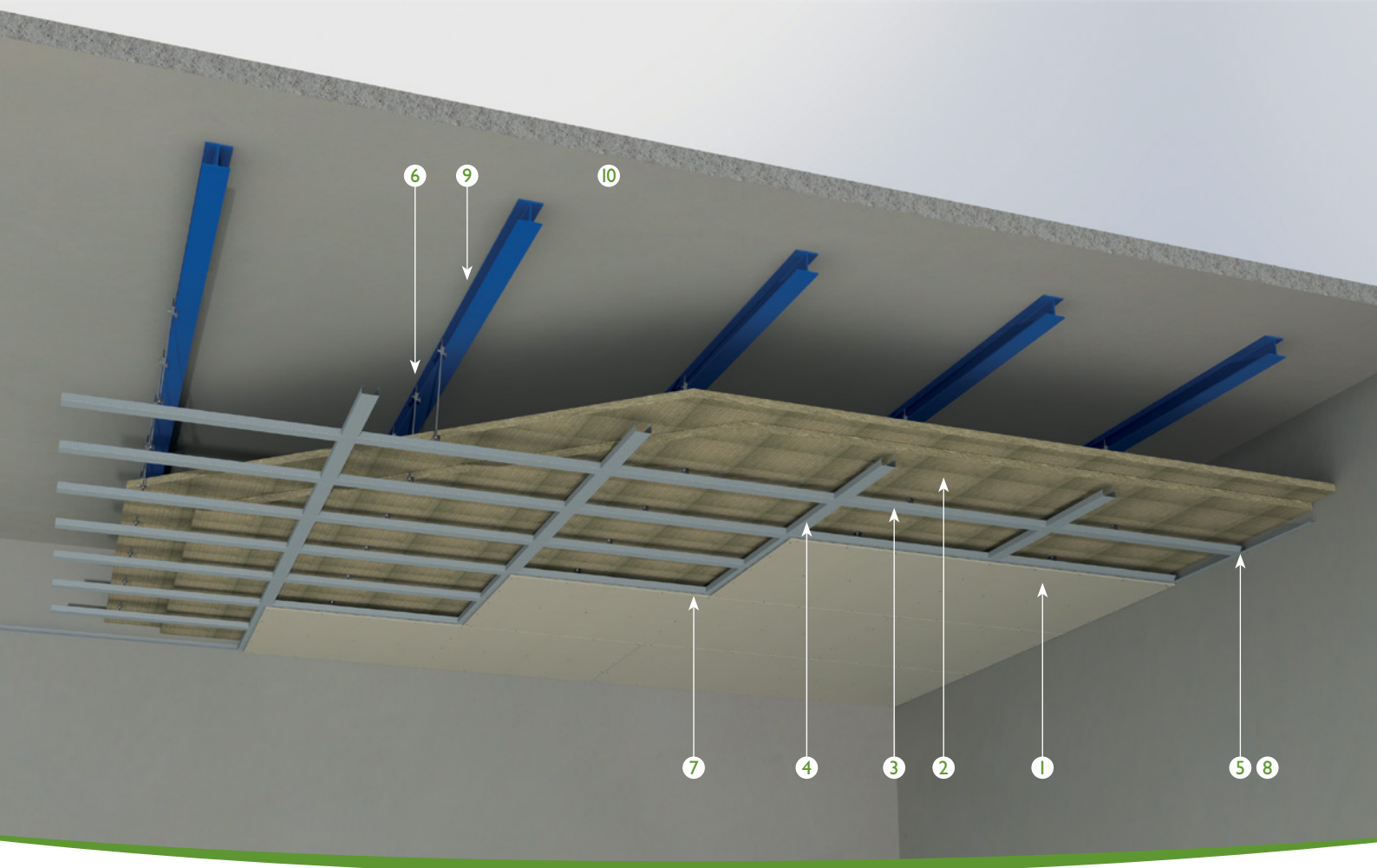
1. FP®-900/FirePro® board
2. Stone wool insulation
3. Main channel grids at maximum 610mm centre
4. Cross channel grids at maximum 1220mm centres
5. Perimeter steel profile
 - L - 45 x 23 x 0.5mm - 50mm web channel
 - C - 27 x 28 x 0.6mm - 60mm web channel
6. Steel thread hanger rods minimum Ø 6mm at maximum 1220mm centres#
 - Lower part of rods connected to main channels
 - Upper part of rods fixed to the concrete slab or steel beams
 - Use of proprietary hanger; please contact Soben International

7. M3.5 self-tapping screws at 200mm centre
8. M6 steel anchors fixed to walls at 500mm centres
9. Steel beams
10. Concrete slab

tensile stress limit not exceeding

fire rating	stress limit
60 minutes	15N/mm ²
120 minutes	10N/mm ²
180 minutes	8N/mm ²

Further details refer to ceiling specification.



FP®-900/FirePro® Suspended Ceiling Membrane FPC 60/90/120/180/240E



FIRE RATING

FRL	Up to -/I80/I80
Standard	BS 476: Part 22: 1987
Approval	Exova WF346643 Fires-FR-169-17-AUNE

ACOUSTIC

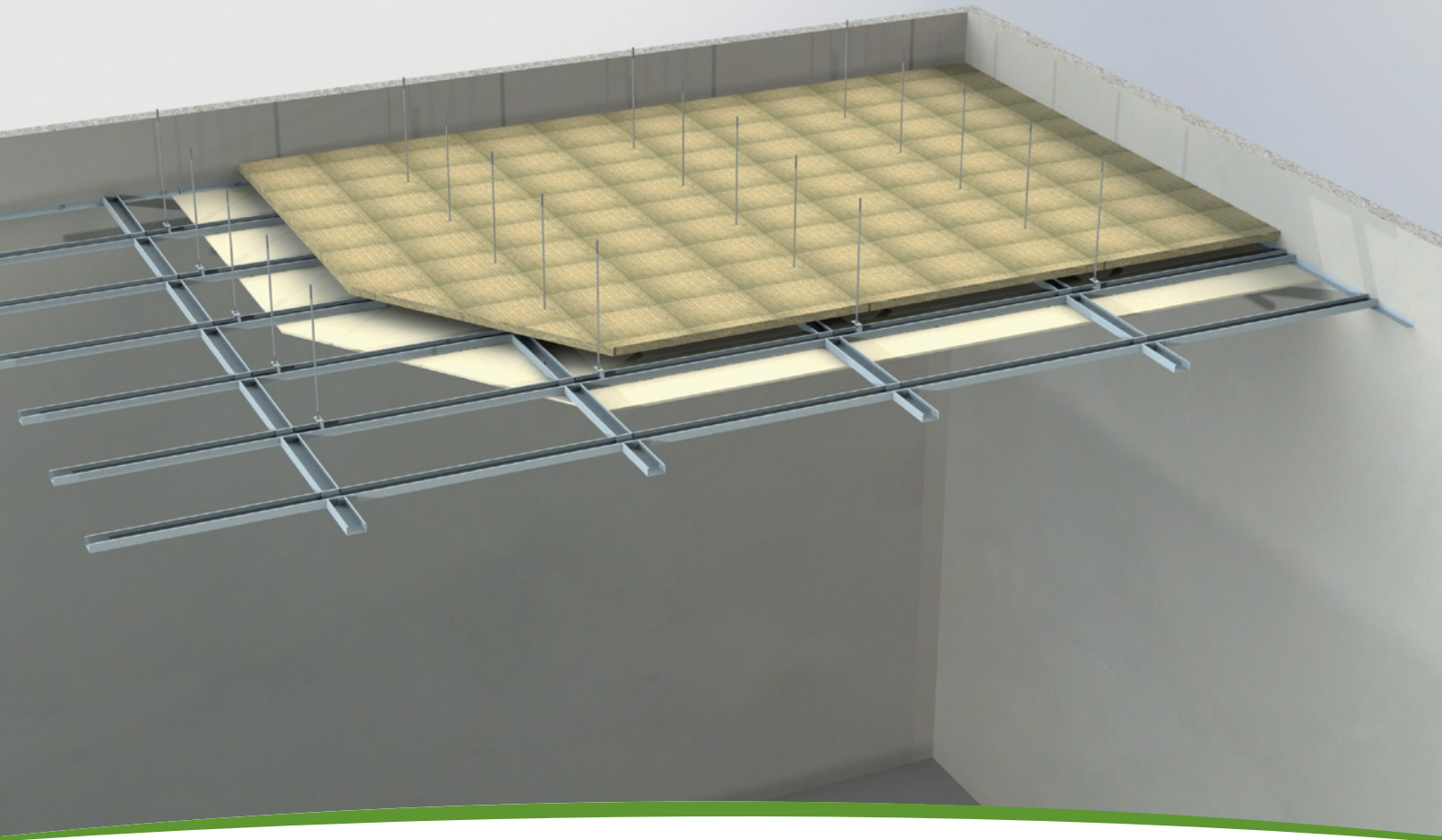
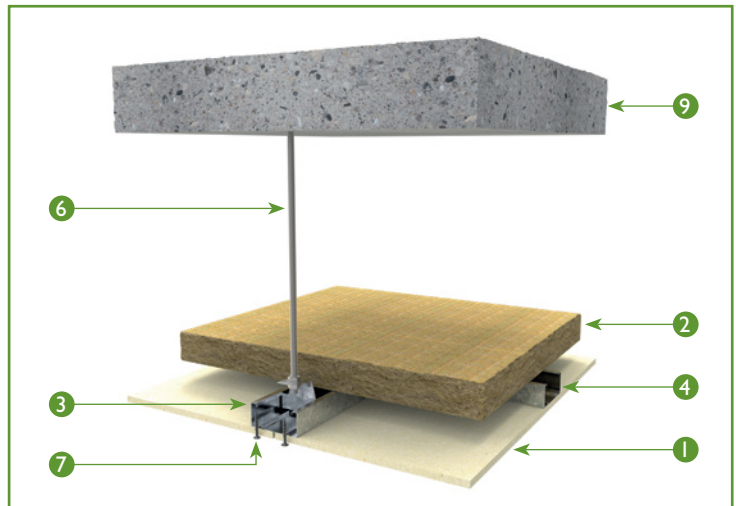
STC / Rw *	38dB up
Standard	EN ISO 10140-2:2010 EN ISO 717-1: 2013
Assessment	Marshall Day - INSUL

SYSTEM

Ceiling thickness	47mm up
Ceiling mass	10 kg/m ² up

* STC / Rw values within +/-3dB

Fire attack from below or above



INSTALLATION

FP®-900/FirePro® fire rated ceiling membrane should be constructed in accordance with the approved specification mentioned in the manufacturer's handbook & the local building regulation (if required).

FP®-900/FirePro® Suspended Ceiling Membrane FPC 60/90/120/180/240E



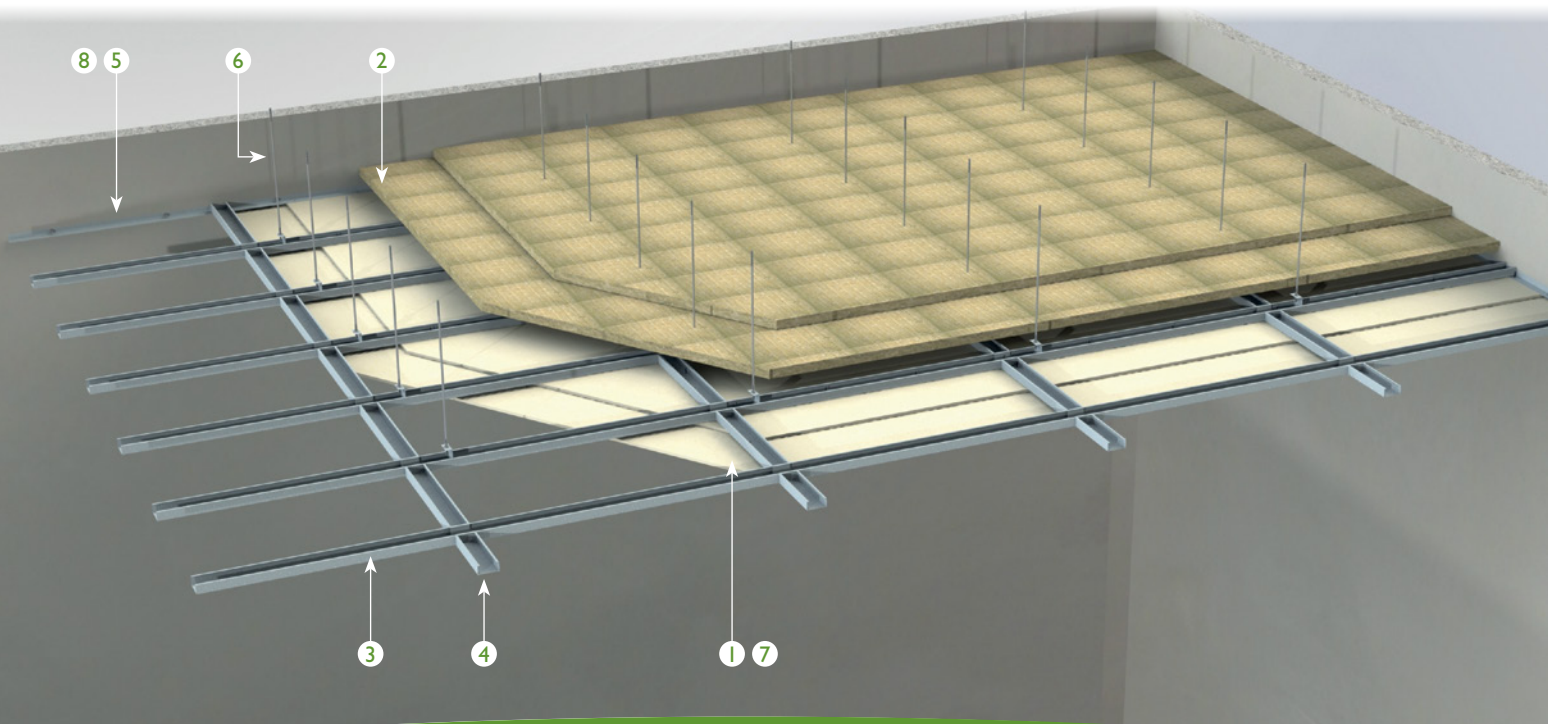
TECHNICAL DATA

1. FP®-900/FirePro® board
2. Stone wool insulation
3. Main channel grids at maximum 610mm centre
4. Cross channel grids at maximum 1220mm centres
5. Perimeter steel angle - 45 x 23 x 0.5mm thick
6. Steel thread hanger rods minimum Ø 8mm at maximum 1220mm centres#
7. M3.5 self-tapping screws
 - Single-layer board at 200mm centres
 - Two-layer board, 1st layer at 400mm centres, 2nd layer at 300mm centres
8. M6 steel anchors at 500mm centres
9. Concrete slab

tensile stress limit not exceeding

fire rating	stress limit
60 minutes	15N/mm ²
120 minutes	10N/mm ²
180 minutes	8N/mm ²
240 minutes	6N/mm ²

Further details refer to ceiling specification.



SPECIFICATION

Fire Rating - minutes		FP®-900/FirePro®	Stone Wool#		Steel Channels*	
Integrity	Insulation	Thickness - mm	mm x kg/m ³	Kg/m ²	web x flanges x thickness - mm	2nd moment of area ly-y mm ⁴
60	60	9	60 x 80	4.8	C - 50 x 32 x 0.6	9810
90	90	12	70 x 100	7.0	C - 50 x 32 x 0.6	9810
120	120	9 + 9	70 x 100	7.0	C - 50 x 35 x 0.6	12970
180	180	12 + 12	100 x 160	16.0	C - 50 x 50 x 0.5	24000
240	-	9	-	-	U - 50 x 38 x 0.5	9810

* Note: The steel channel can be U or C channel provided it should not be less than the specified ly-y second moment of area for the channel.
Alternative thicknesses and densities of mineral wool insulation may be fitted provided that the weight per square meter is at least that specified.

FP®-900/FirePro® Suspended Ceiling Membrane FPC 60/90/120/180/240E



FIRE RATING

FRL	Up to -/240/-
Standard	BS 476: Part 22: 1987
Approval	FT09046

ACOUSTIC

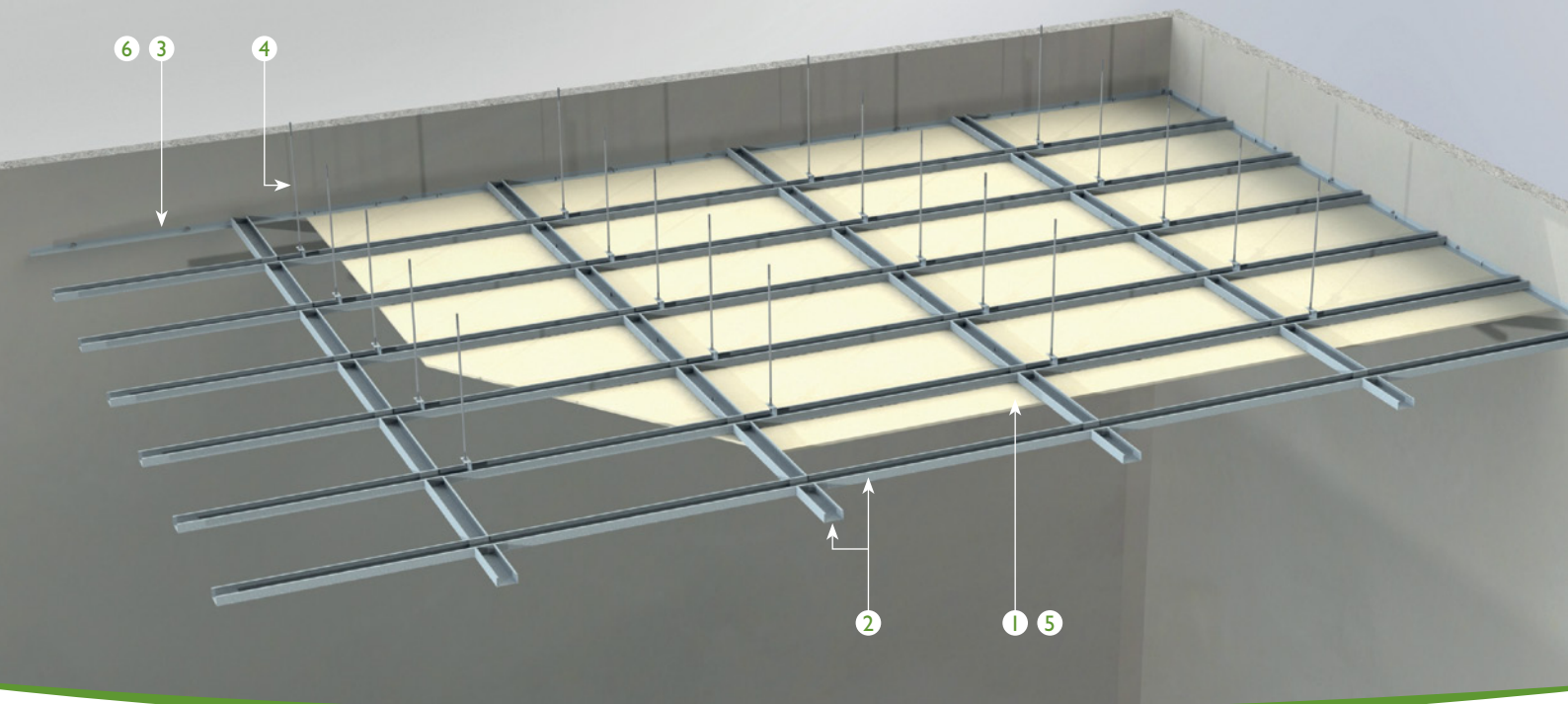
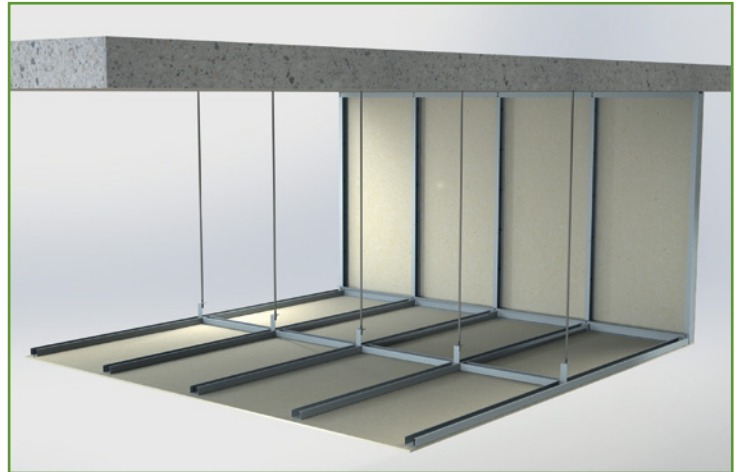
STC / Rw *	28dB
Standard	EN ISO 10140-2:2010 EN ISO 717-1: 2013
Assessment	Marshall Day - INSUL

SYSTEM

Ceiling thickness	47mm up
Ceiling mass	10 kg/m ² up

* STC / Rw values within +/-3dB

Fire attack from below or above, integrity only



TECHNICAL DATA

- FP®-900/FirePro® board 9mm thick
- Main & Cross channels 50 x 38 x 0.5mm thick
 - Main channels at maximum 610mm centres
 - Cross channels at 1220mm centres
- Perimeter steel angle 45 x 23 x 0.5mm thick
- Steel thread hanger rods minimum Ø 8mm at maximum 1220mm centres
- M3.5 self-tapping screws at 200mm centre
- M6 steel anchors at 500mm centres



STEEL FRAMEWORK FOR FP®-900/FIREPRO® SELF-SUPPORTING CEILING MEMBRANE

When drop rods of a FP®-900/FirePro® ceiling membrane are unable suspended from a floor or roof above, the ceiling membrane can be supported by its own steel framework which spans over perimeter walls which are fire resistant

The ceiling framework can be constructed with hot roll steel sections or/and cold form steel sections; U-channel, C-channel or RHS sections. As the span of support increases, the size of main steel member also must increase. The steel member should not be smaller than the specified minimum size of the member. The minimum size of main steel member section related to the span of support up to 6m is given in Table CS1 to CS8.

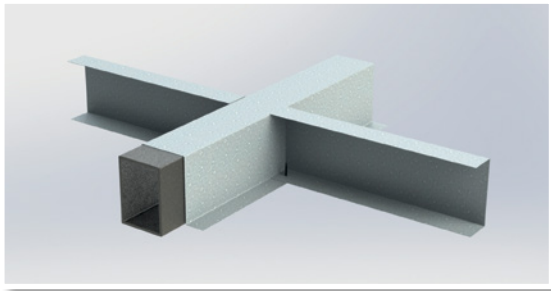


TYPICAL ARRANGEMENT FOR FRAMEWORK

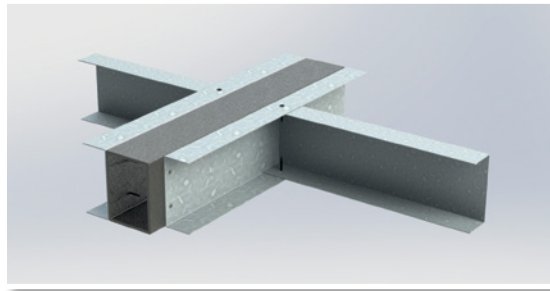


ALTERNATIVE FRAMEWORK CONSTRUCTION

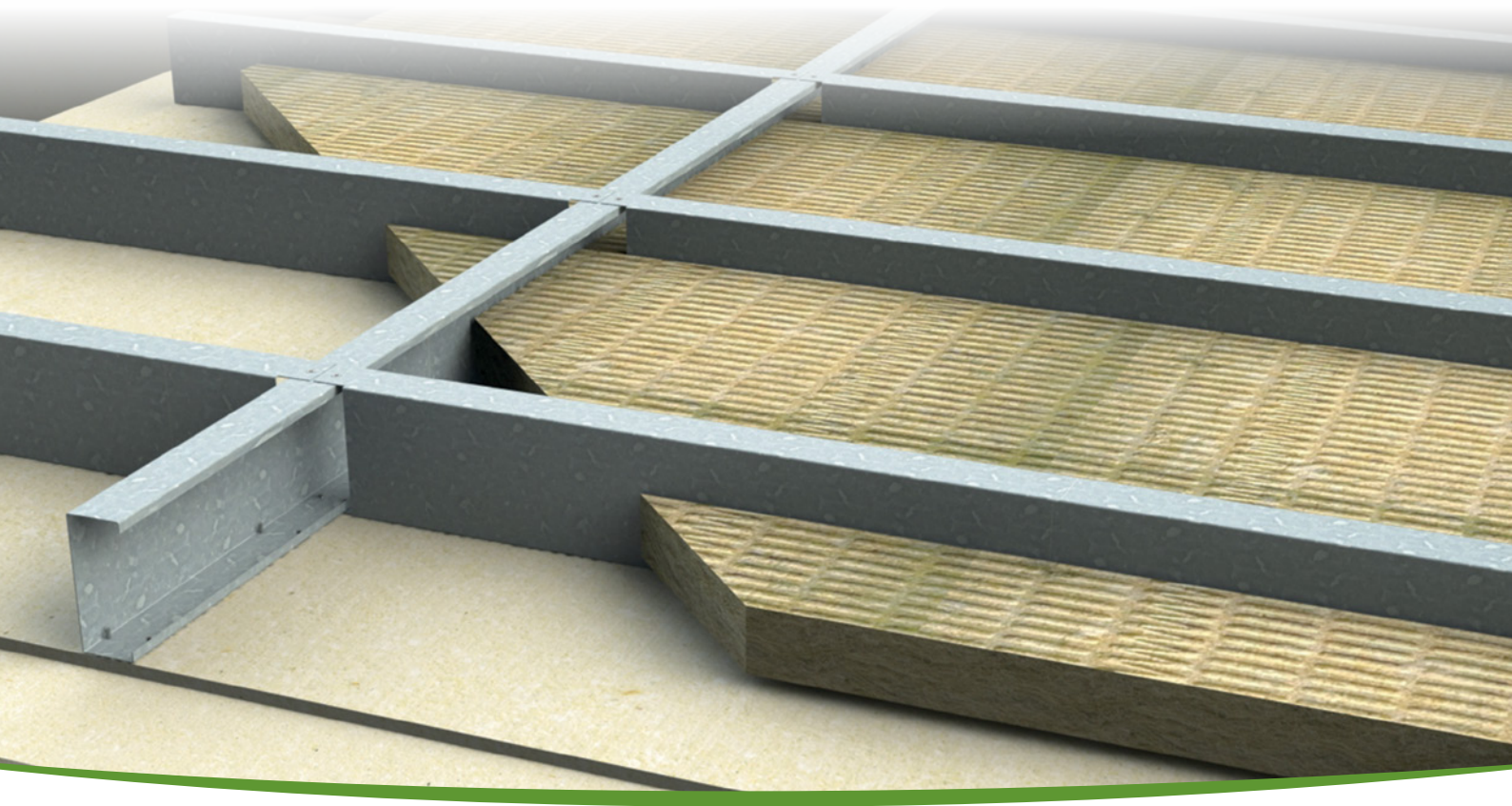
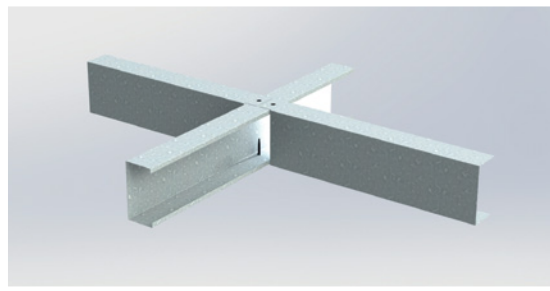
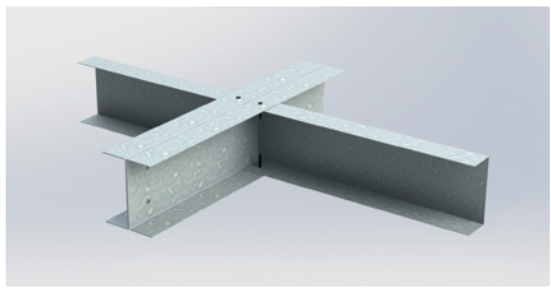
**TOP HAT SECTION LAID OVER
RHS MAIN MEMBER**



**U-CHANNELS FASTENED TO
RHS MAIN MEMBER**



MAIN MEMBER CONSTRUCTED WITH BACK-TO-BACK CHANNELS OR CHANNEL

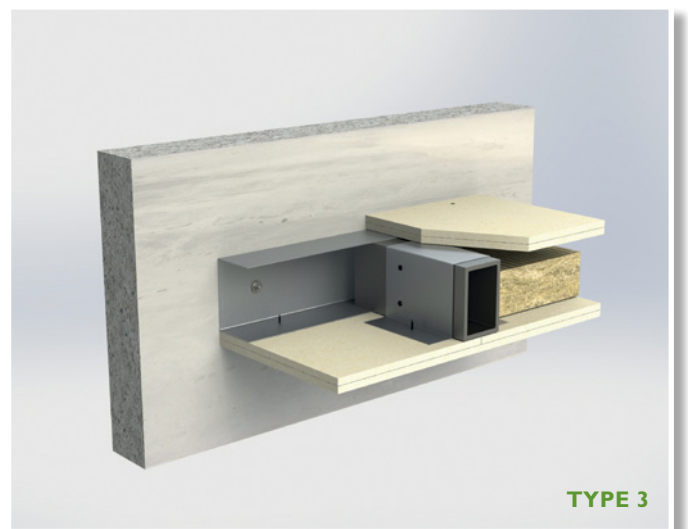
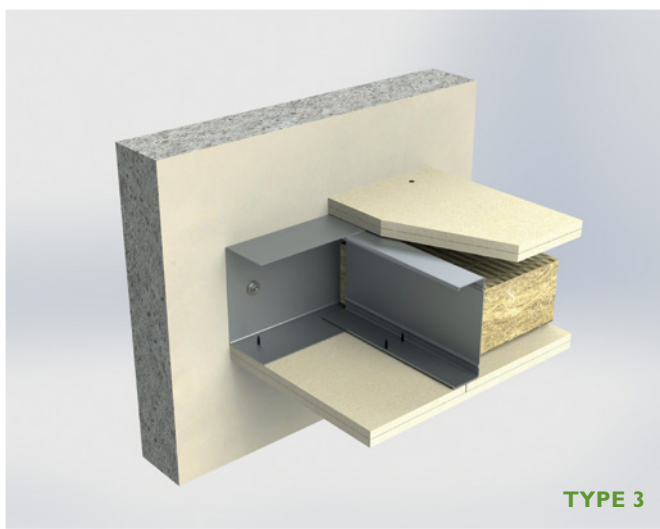
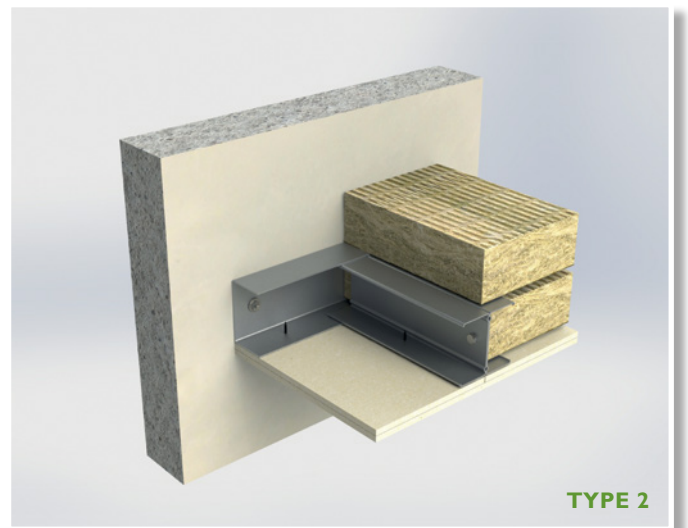
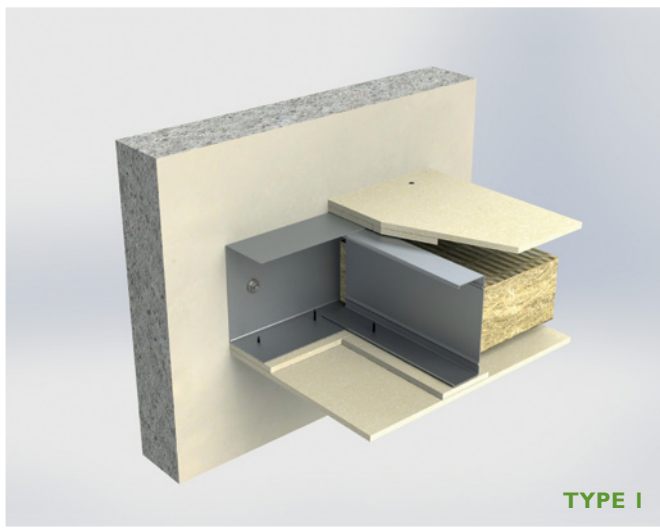


THERMAL EXPANSION

Minimum thermal longitudinal expansion allowance of at least 5mm/m is required for main steel members with span greater than 3.0m. The expansion allowance may be provided at one or both ends of the main steel member. If channel sections are used, the perimeter U-channel sections at two ends are to support the main channel members. The U-channel must have approximately the same web dimension as the main channel members so that the main members are a sliding fit in the perimeter channels. Minimum allowance for expansion is given in Table CS1 to CS8.

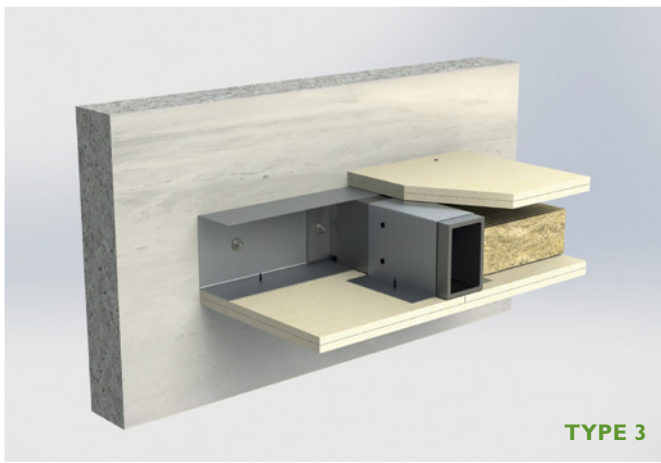
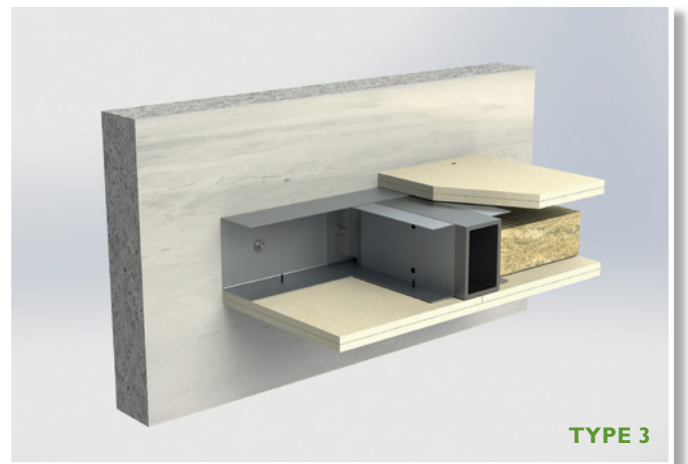
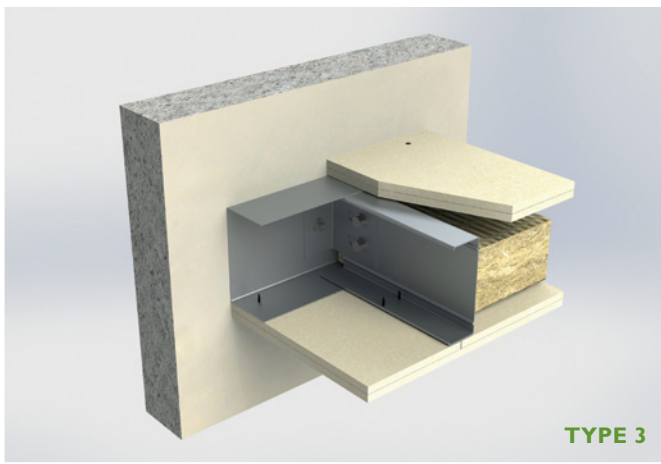
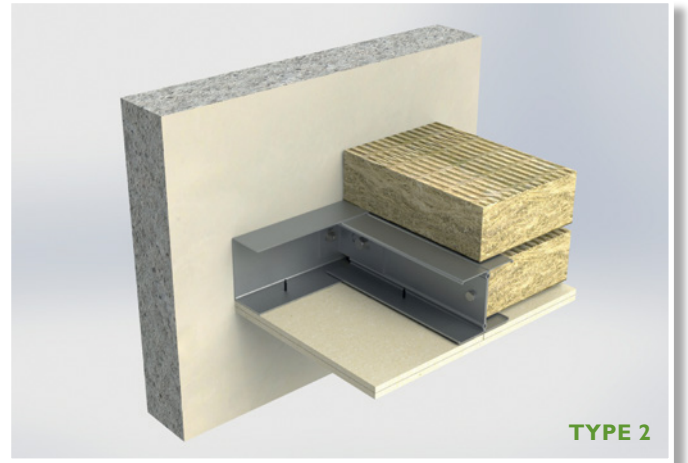
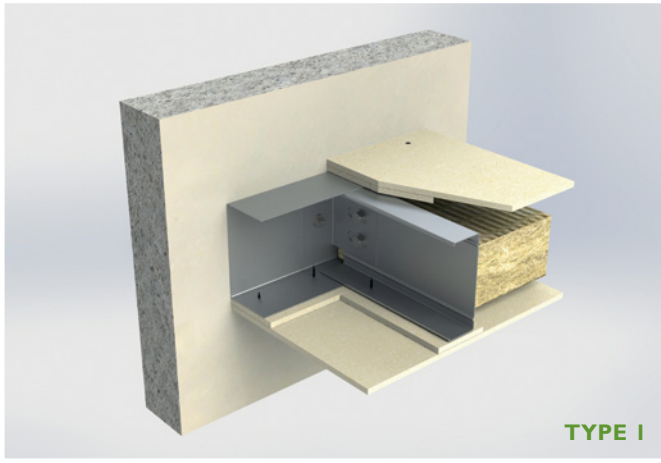
EXPANSION ALLOWANCE FOR SPAN OF SUPPORT ≤ 4M

The main member is a sliding fit in the perimeter channel. It is applicable to all types of ceiling.



EXPANSION ALLOWANCE FOR SPAN OF SUPPORT > 4M

The main member is a sliding fit in the perimeter channel and positioned by a steel angle cleat with at least one or two slot holes. The main member is bolted through the slot holes by M8 bolts to guide its longitudinal movement. The steel angle cleat is fastened to the perimeter wall with a steel anchor M10. It is applicable to all types of ceiling.



FP®-900/FirePro® Self-supporting Ceiling Membrane CEILING FRAMEWORK



FRAMEWORK FOR FP®-900/FIREPRO® SELF-SUPPORTING CEILING MEMBRANE ASSEMBLIES

The tables below provide sizes of members which may not be available in some countries. Alternative sizes and sections may be fitted provided that the minimum section modulus of the member is at least that specified.

TABLE CS1	FIRE RATING: 60 MINUTES, -/60/60			
Span	Main member channels web x flanges x thickness	Minimum section modulus, Z	Cross channels web x flanges x thickness	Expansion allowance *
3.0m	100 x 50 x 1.0mm	5.6cm ³	100 x 50 x 0.6mm	-
3.5m	100 x 50 x 1.0mm	5.6cm ³	100 x 50 x 0.6mm	15.0mm
4.0m	100 x 50 x 1.0mm	5.9cm ³	100 x 50 x 0.6mm	20.0mm
4.5m	125 x 50 x 1.2mm	7.9cm ³	125 x 50 x 0.6mm	22.5mm
5.0m	125 x 60 x 1.0mm	9.7cm ³	150 x 50 x 0.6mm	25.0mm
5.5m	80 x 60 x 1.2mm back-to-back channels	11.8cm ³	80 x 50 x 0.6mm	27.5mm
6.0m	100 x 50 x 1.2mm back-to-back channels	14.6cm ³	100 x 50 x 0.6mm	30.0mm

TABLE CS2	FIRE RATING: 60 MINUTES, -/60/60			
Span	Main member RHS Height x width x thickness	Minimum section modulus, Z	Cross channels web x flanges x thickness	Expansion allowance *
3.0m	RHS 50 x 50 x 2.0mm	5.6cm ³	50 x 50 x 0.6mm	-
3.5m	RHS 50 x 50 x 2.0mm	5.6cm ³	50 x 50 x 0.6mm	15.0mm
4.0m	RHS 50 x 50 x 2.5mm	5.9cm ³	50 x 50 x 0.6mm	20.0mm
4.5m	RHS 60 x 60 x 2.0mm	7.9cm ³	60 x 50 x 0.6mm	22.5mm
5.0m	RHS 60 x 60 x 2.5mm	9.7cm ³	60 x 50 x 0.6mm	25.0mm
5.5m	RHS 70 x 50 x 3.0mm	11.8cm ³	70 x 50 x 0.6mm	27.5mm
6.0m	RHS 80 x 60 x 2.5mm	14.6cm ³	80 x 50 x 0.6mm	30.0mm

* Minimum total width for expansion allowance at one or both ends of main members.

Alternatively, steel top hat sections are laid over the RHS members, the hat section's depth and width match the RHS members and minimum 30mm flanges x 0.5mm thick.

FP®-900/FirePro® Self-supporting Ceiling Membrane CEILING FRAMEWORK



TABLE CS3		FIRE RATING: 120 MINUTES, -/I20/I20		
Span	Main member back-to-back channels web x flanges x thickness	Minimum section modulus, Z	Cross channels web x flanges x thickness	Expansion allowance *
2.5m	80 x 60 x 1.2mm	11.8cm ³	80 x 50 x 0.6mm	-
3.0m	100 x 60 x 1.5mm	18.3cm ³	100 x 50 x 0.6mm	-
3.5m	100 x 60 x 1.8mm	25.0cm ³	100 x 50 x 0.6mm	15.0mm
4.0m	100 x 60 x 2.5mm	34.7cm ³	100 x 50 x 0.6mm	20.0mm
4.5m	150 x 60 x 2.0mm	48.7cm ³	150 x 50 x 0.6mm	22.5mm
5.0m	150 x 80 x 2.0mm	59.8cm ³	150 x 50 x 0.6mm	25.0mm
5.5m	175 x 60 x 3.0mm	75.0cm ³	175 x 50 x 0.6mm	27.5mm
6.0m	175 x 80 x 3.0mm	105.2cm ³	175 x 50 x 0.6mm	30.0mm

TABLE CS4		FIRE RATING: 120 MINUTES, -/I20/I20		
Span	Main member RHS Height x width x thickness	Minimum section modulus, Z	Cross channels web x flanges x thickness	Expansion allowance *
2.5m	RHS 70 x 50 x 3.0mm	11.8cm ³	70 x 50 x 0.6mm	-
3.0m	RHS 80 x 40 x 5.0mm	18.3cm ³	80 x 50 x 0.6mm	-
3.5m	RHS 80 x 60 x 5.0mm	25.0cm ³	80 x 50 x 0.6mm	15.0mm
4.0m	RHS 100 x 60 x 5.0mm	34.7cm ³	100 x 50 x 0.6mm	20.0mm
4.5m	RHS 120 x 80 x 4.0mm	48.7cm ³	120 x 50 x 0.6 mm	22.5mm
5.0m	RHS 120 x 80 x 6.0mm	59.8cm ³	120 x 50 x 0.6mm	25.0mm
5.5m	RHS 120 x 80 x 8.0mm	75.0cm ³	120 x 50 x 0.6mm	27.5mm
6.0m	RHS 150 x 100 x 6.0mm	105.2cm ³	150 x 50 x 0.6mm	30.0mm

* Minimum total width for expansion allowance at one or both ends of main members.

Alternatively, steel top hat sections are laid over the RHS members, the hat section's depth and width match the RHS members and minimum 30mm flanges x 0.5mm thick.

FP®-900/FirePro® Self-supporting Ceiling Membrane CEILING FRAMEWORK



TABLE CS5		FIRE RATING: 180 MINUTES, -/I80/I80		
Span	Main member back-to-back channels web x flanges x thickness	Minimum section modulus, Z	Cross channels web x flanges x thickness	Expansion allowance *
2.5m	100 x 60 x 1.8mm	23.4cm ³	100 x 50 x 0.6mm	-
3.0m	100 x 60 x 2.5mm	35.4cm ³	100 x 50 x 0.6mm	-
3.5m	150 x 80 x 1.7mm	51.2cm ³	150 x 50 x 0.6mm	15.0mm
4.0m	175 x 80 x 2.0mm	69.1cm ³	175 x 50 x 0.6mm	20.0mm
4.5m	175 x 80 x 2.5mm	90.3cm ³	175 x 50 x 0.6mm	22.5mm
5.0m	200 x 85 x 2.5mm	112.5cm ³	200 x 50 x 0.6mm	25.0mm
5.5m	200 x 100 x 3.0mm	143.5cm ³	200 x 50 x 0.6mm	27.5mm
6.0m	250 x 100 x 3.0mm	195.0cm ³	250 x 50 x 0.6mm	30.0mm

TABLE CS6		FIRE RATING: 180 MINUTES, -/I80/I80		
Span	Main member RHS Height x width x thickness [#]	Minimum section modulus, Z	Cross channels web x flanges x thickness	Expansion allowance *
2.5m	RHS 100 x 60 x 3.0mm	23.4cm ³	100 x 50 x 1.2mm	-
3.0m	RHS 100 x 60 x 5.0mm	35.4cm ³	100 x 50 x 1.2mm	-
3.5m	RHS 100 x 80 x 6.0mm	51.2cm ³	100 x 50 x 1.2mm	15.0mm
4.0m	RHS 120 x 80 x 7.1mm	69.1cm ³	120 x 50 x 1.2mm	20.0mm
4.5m	RHS 150 x 100 x 5.0mm	90.3cm ³	150 x 50 x 1.2mm	22.5mm
5.0m	RHS 160 x 80 x 7.1mm	112.5cm ³	160 x 50 x 1.2mm	25.0mm
5.5m	RHS 160 x 90 x 8.8mm	143.5cm ³	160 x 50 x 1.2mm	27.5mm
6.0m	RHS 180 x 120 x 8.0mm	195.0cm ³	180 x 50 x 1.2mm	30.0mm

* Minimum total width for expansion allowance at one or both ends of main members.

[#] Alternatively, steel top hat sections are laid over the RHS members, the hat section's depth and width match the RHS members and minimum 30mm flanges x 1.2mm thick.

FP®-900/FirePro® Self-supporting Ceiling Membrane CEILING FRAMEWORK



TABLE CS7		FIRE RATING: 240 MINUTES, -/240/240		
Span	Main member back-to-back channels web x flanges x thickness	Minimum section modulus, Z	Cross channels web x flanges x thickness	Expansion allowance *
2.5m	100 x 60 x 1.8mm	26.1cm ³	100 x 50 x 0.6mm	-
3.0m	125 x 80 x 1.7mm	39.5cm ³	125 x 50 x 0.6mm	-
3.5m	175 x 80 x 1.5mm	54.6cm ³	175 x 50 x 0.6mm	15.0mm
4.0m	175 x 85 x 2.0mm	75.3cm ³	175 x 50 x 0.6mm	20.0mm
4.5m	185 x 80 x 2.5mm	97.5cm ³	175 x 50 x 0.6mm	22.5mm
5.0m	200 x 100 x 2.5mm	121.0cm ³	200 x 50 x 0.6mm	25.0mm
5.5m	225 x 85 x 3.0mm	155.3cm ³	225 x 50 x 0.6mm	27.5mm
6.0m	225 x 125 x 3.0mm	207.7cm ³	225 x 50 x 0.6mm	30.0mm

TABLE CS8		FIRE RATING: 240 MINUTES, -/240/240		
Span	Main member RHS Height x width x thickness [#]	Minimum section modulus, Z	Cross channels web x flanges x thickness	Expansion allowance *
2.5m	RHS 100 x 50 x 4.0mm	26.1cm ³	100 x 50 x 1.2mm	-
3.0m	RHS 100 x 60 x 6.0mm	39.5cm ³	100 x 50 x 1.2mm	-
3.5m	RHS 120 x 60 x 6.0mm	54.6cm ³	120 x 50 x 1.2mm	15.0mm
4.0m	RHS 120 x 80 x 8.0mm	75.3cm ³	120 x 50 x 1.2mm	20.0mm
4.5m	RHS 160 x 90 x 5.0mm	97.5cm ³	160 x 50 x 1.2mm	22.5mm
5.0m	RHS 150 x 100 x 7.1mm	121.0cm ³	150 x 50 x 1.2mm	25.0mm
5.5m	RHS 180 x 100 x 7.1mm	155.3cm ³	180 x 50 x 1.2mm	27.5mm
6.0m	RHS 180 x 120 x 8.8mm	207.7cm ³	180 x 50 x 1.2mm	30.0mm

* Minimum total width for expansion allowance at one or both ends of main members.

[#] Alternatively, steel top hat sections are laid over the RHS members, the hat section's depth and width match the RHS members and minimum 30mm flanges x 1.2mm thick.

INSTALLATION

FP-900®/FirePro® fire rated self-supporting ceiling membrane systems should be constructed in accordance with the approved specification mentioned in the manufacturer's handbook & the local building regulations (if required). For projects with specific requirements, please contact Soben International.

FP®-900/FirePro® Self-supporting Ceiling Membrane - Type I FPCS 60/120



FIRE RATING

FRL	-/60/60
	-/120/120
Standard	BS 476: Part 22: 1987
Approval	Exova 342288

ACOUSTIC

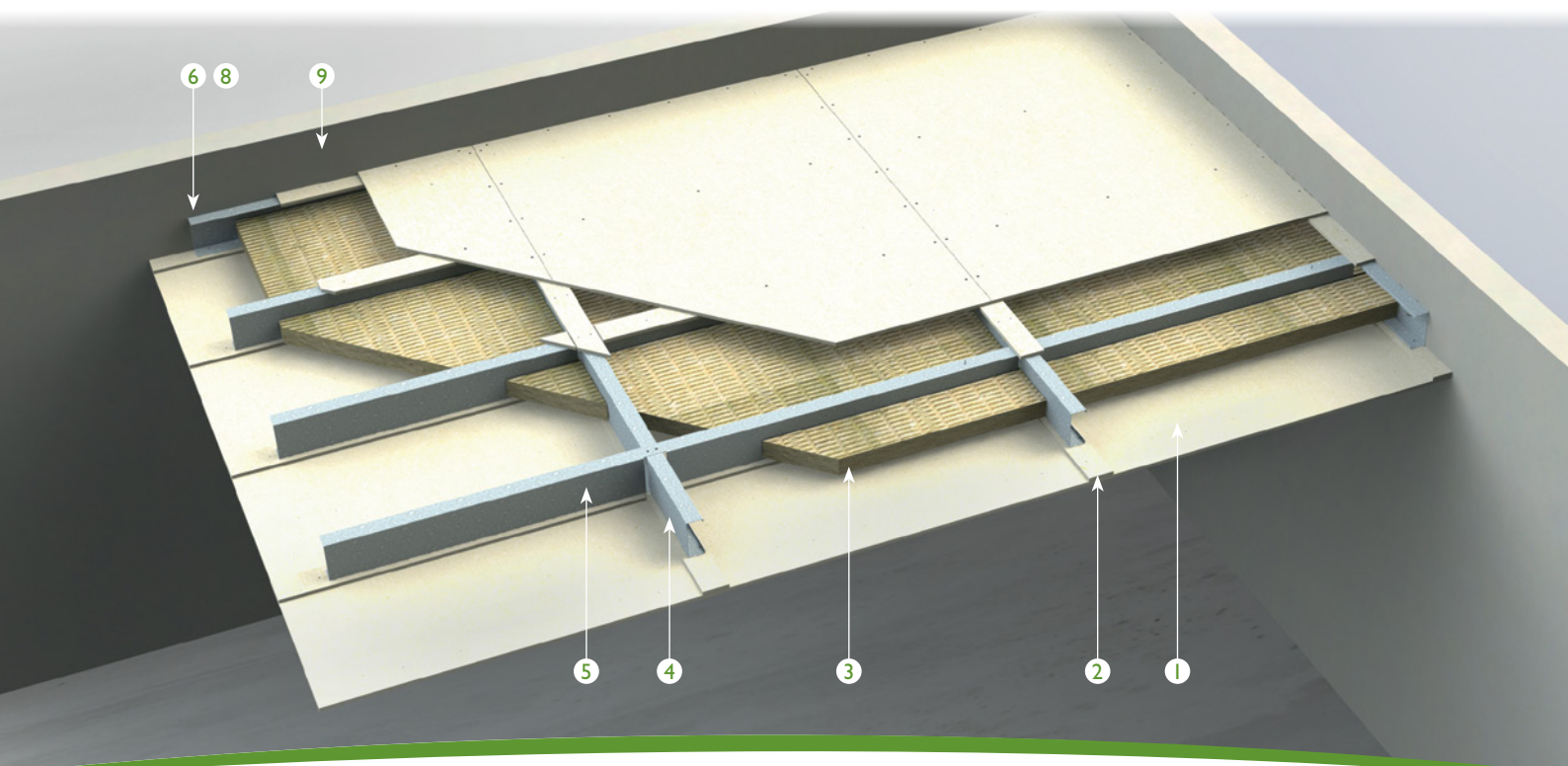
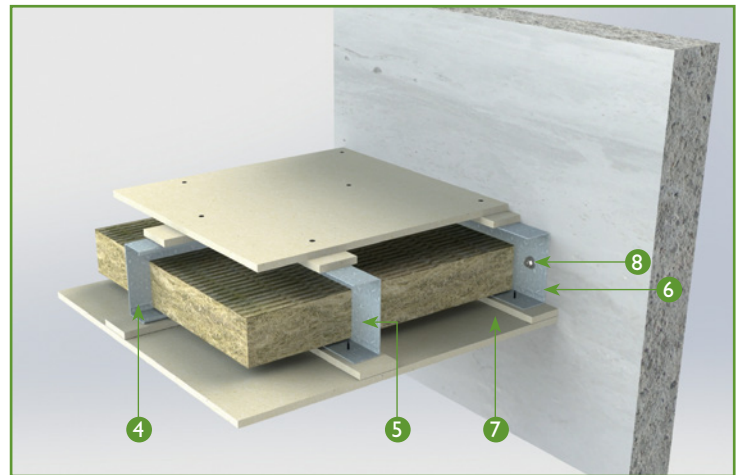
STC / Rw *	44dB up
Standard	EN ISO 10140-2:2010 EN ISO 717-1: 2013
Assessment	Marshall Day - INSUL

SYSTEM

Ceiling thickness	86mm up
Partition mass	27.5 kg/m ²

* STC / Rw values within +/-3dB

Fire attack from above or below



TECHNICAL DATA

- FP®-900/FirePro® board 9mm thick above & below
- The FP®-900/FirePro® fillets minimum 90mm wide x 9mm thick above & below steel frame
- Stone wool
 - 60mm x 40kg/m³ for FRL: -/60/60
 - 80mm x 100kg/m³ for FRL: -/120/120
- Main steel members at maximum 1220mm centres & maximum span of support up to 6m*, size of members given in Table CSI to CS4
- Cross steel members at maximum 610mm centres
- Perimeter steel channel
- M3.5 self-tapping screws at nominal 300mm centres
- Minimum M8 steel anchors at nominal 500mm centres
- Wall supports

FP®-900/FirePro® Self-supporting Ceiling Membrane - Type 2 FPCS 60/120



FIRE RATING

FRL	-/60/60
	-/120/120
Standard	BS 476: Part 22: 1987
Approval	Exova 342288

ACOUSTIC

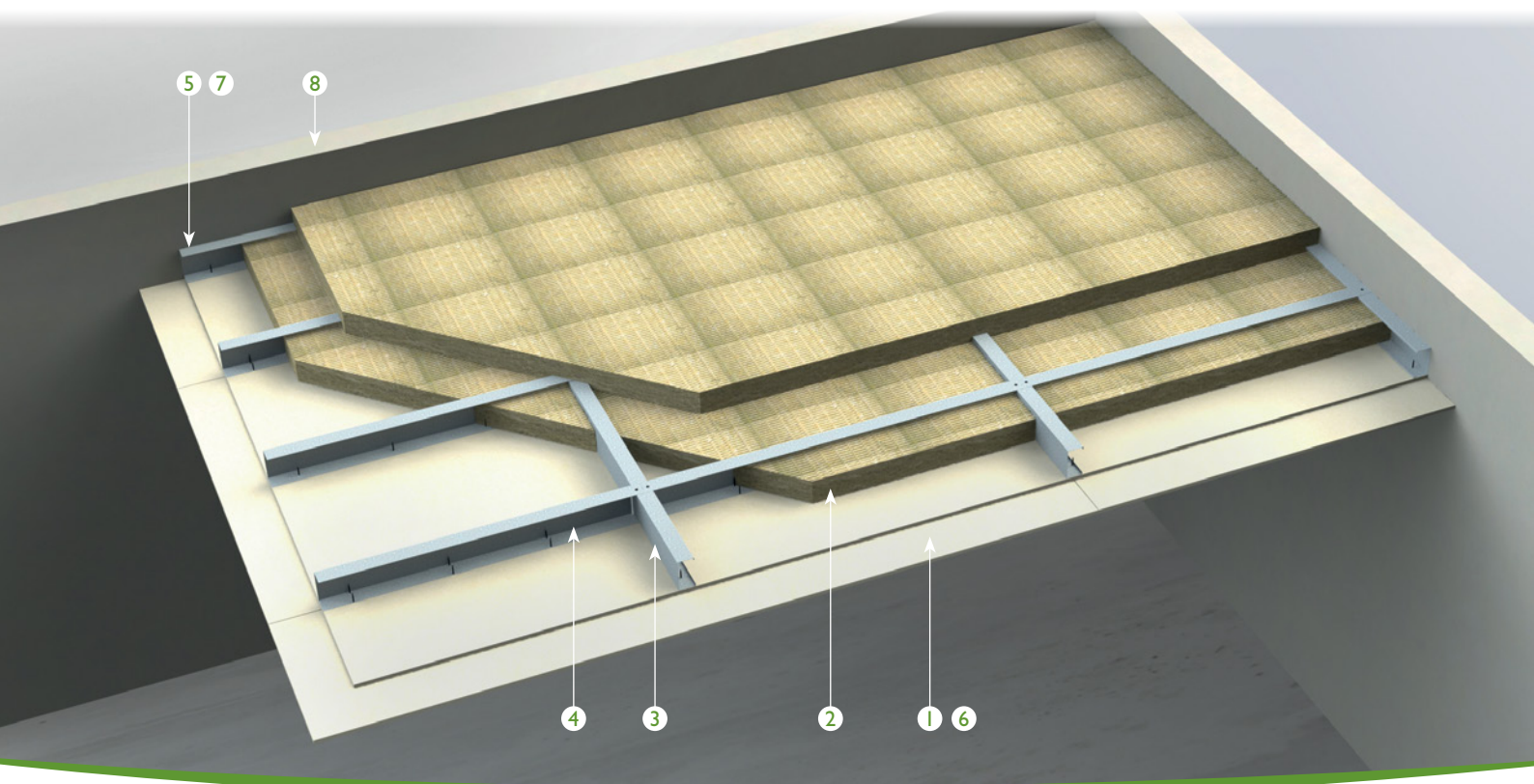
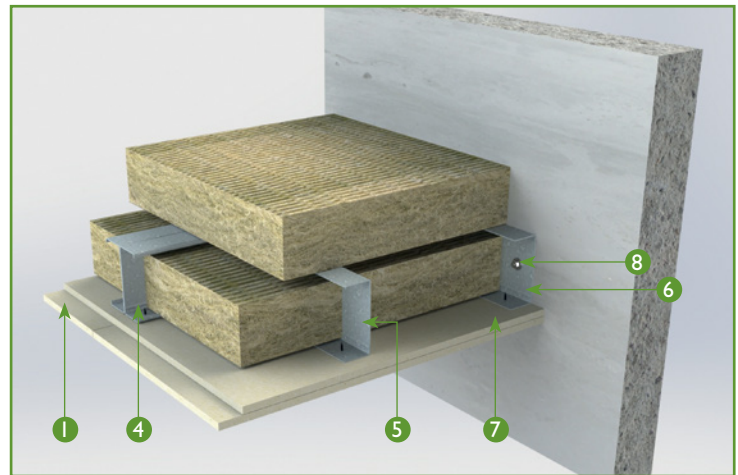
STC / Rw *	37dB
Standard	EN ISO 10140-2:2010 EN ISO 717-1: 2013
Assessment	Marshall Day - INSUL

SYSTEM

Ceiling thickness	118mm up
Partition mass	25.6kg/m ² up

* STC / Rw values within +/-3dB

Fire attack from above or below



TECHNICAL DATA

- FP®-900/FirePro® board 2 x 9mm thick below steel frame
- Stone wool
 - 60mm x 40kg/m³ for FRL: -/60/60
 - 80mm x 100kg/m³ for FRL: -/120/120
- Main steel members at maximum 1220mm centres & maximum span of support up to 6m*, size of members given in Table CS1 to CS4
- Cross steel members at maximum 610mm centres
- Perimeter steel channel
- M3.5 self-tapping screws
 - 1st layer of board at 400mm nominal centres
 - 2nd layer of board at 300mm nominal centres
- Minimum M8 steel anchors at nominal 500mm centre
- Wall supports

FP®-900/FirePro® Self-supporting Ceiling Membrane - Type 3 FPCS3 - 180/240



FIRE RATING

FRL	-/180/180
	-/240/240
Standard	BS 476: Part 22: 1987
Approval	Exova 342288

ACOUSTIC

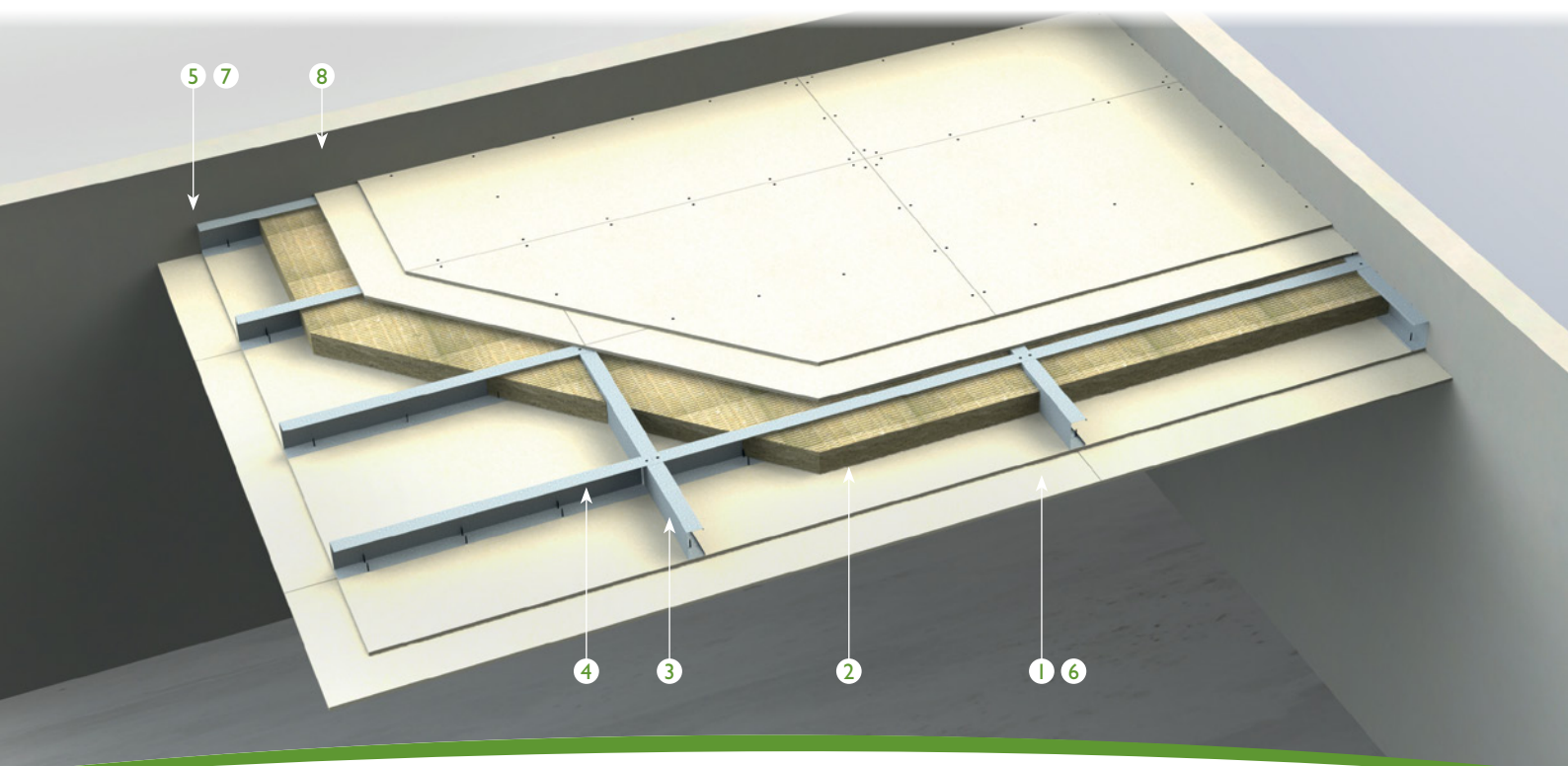
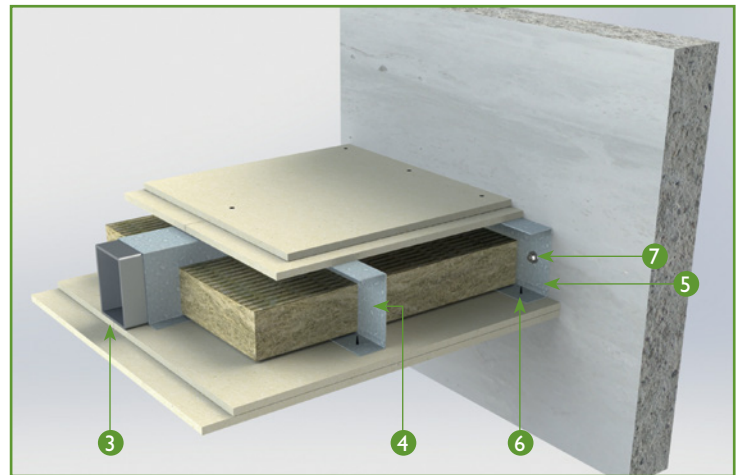
STC / Rw *	52dB up
Standard	EN ISO 10140-2: 2010 EN ISO 717-1: 2013
Assessment	Marshall Day - INSUL

SYSTEM

Ceiling thickness	148mm up
Partition mass	55.3kg/m ² up

* STC / Rw values within 3dB

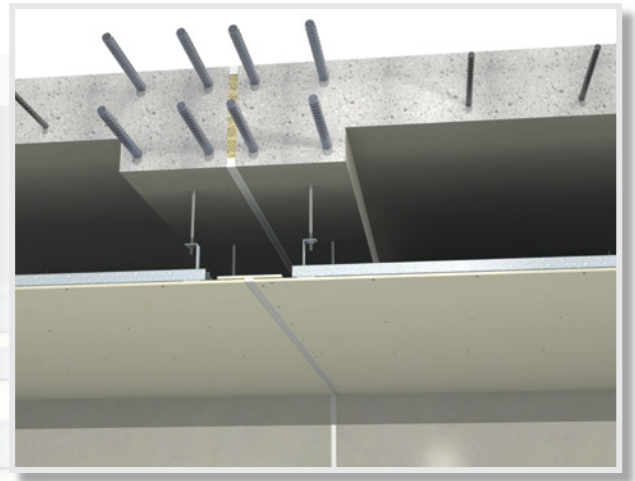
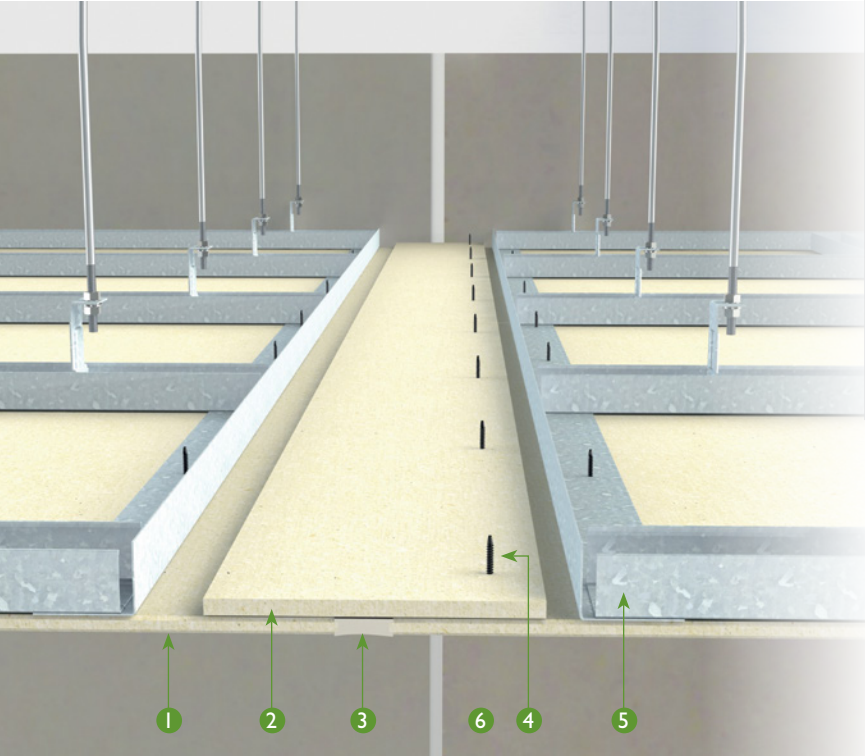
Fire attack from above or below



TECHNICAL DATA

- FP®-900/FirePro® board 2 x 12mm thick above & below steel frame
- Stone wool
 - 100mm x 100kg/m³ for FRL: -/180/180
 - 100mm x 160kg/m³ for FRL: -/240/240
- Main steel members at maximum 1220mm centres & maximum span of support up to 6m*, size of members given in Table CS5 to CS8
- Cross steel members at maximum 610mm centres
- Perimeter steel channel
- M3.5 self-tapping screws
 - 1st layer of board at 400mm nominal centres
 - 2nd layer of board at 300mm nominal centres
- Minimum M8 steel anchors at nominal 500mm centre
- Wall supports

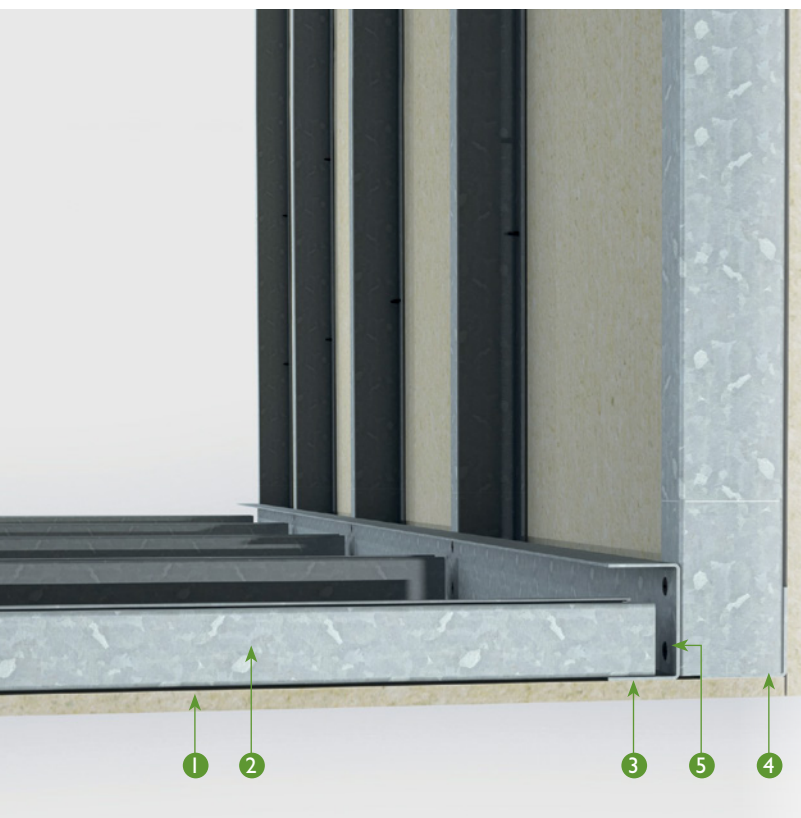
MOVEMENT JOINT



TECHNICAL DATA

1. FP®-900/FirePro® board
2. FP®-900/FirePro® cover strip
3. Silicone based fire rated sealant board at joint
4. M3.5 self tapping screws at maximum 200mm centres
5. Ceiling framework
6. Movement joint of structure

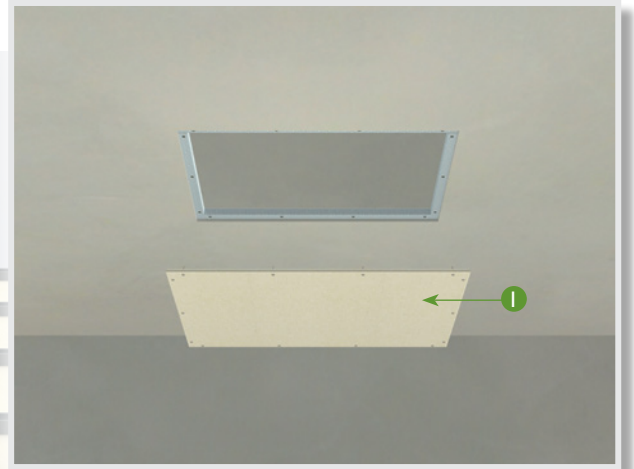
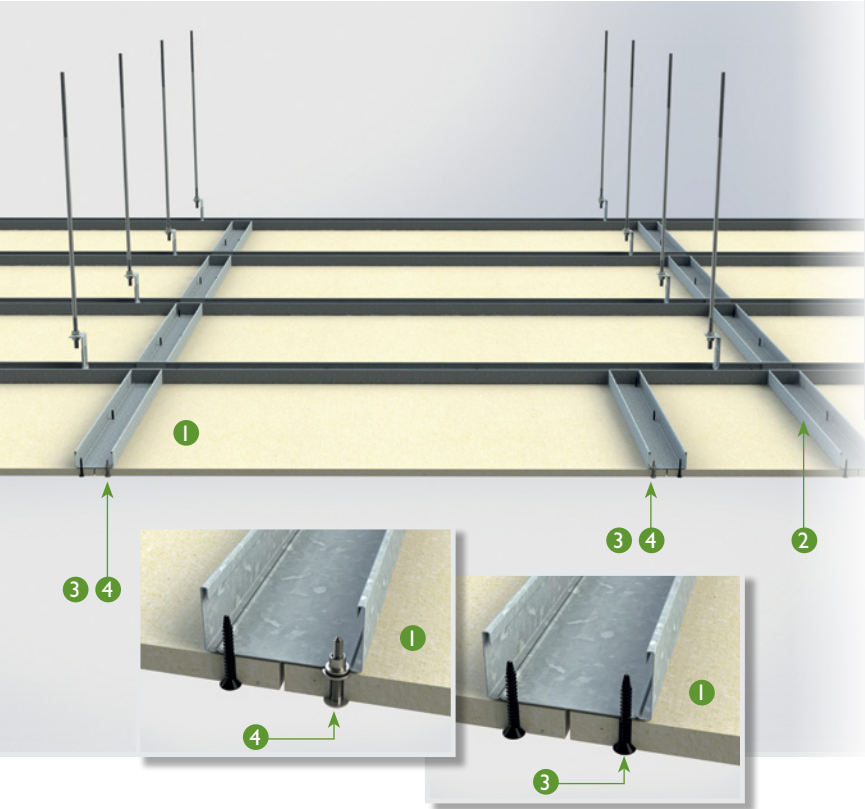
VERTICAL RETURN



TECHNICAL DATA

1. FP®-900/FirePro® board
2. Ceiling channel grid
3. U-channel
4. Steel angles
5. M3.5 x 16mm self-tapping screws

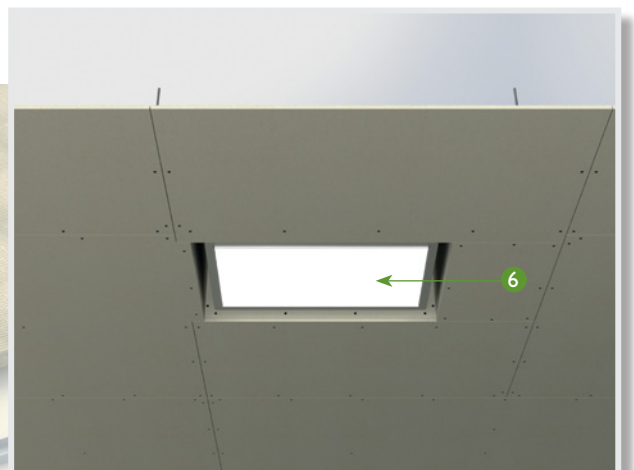
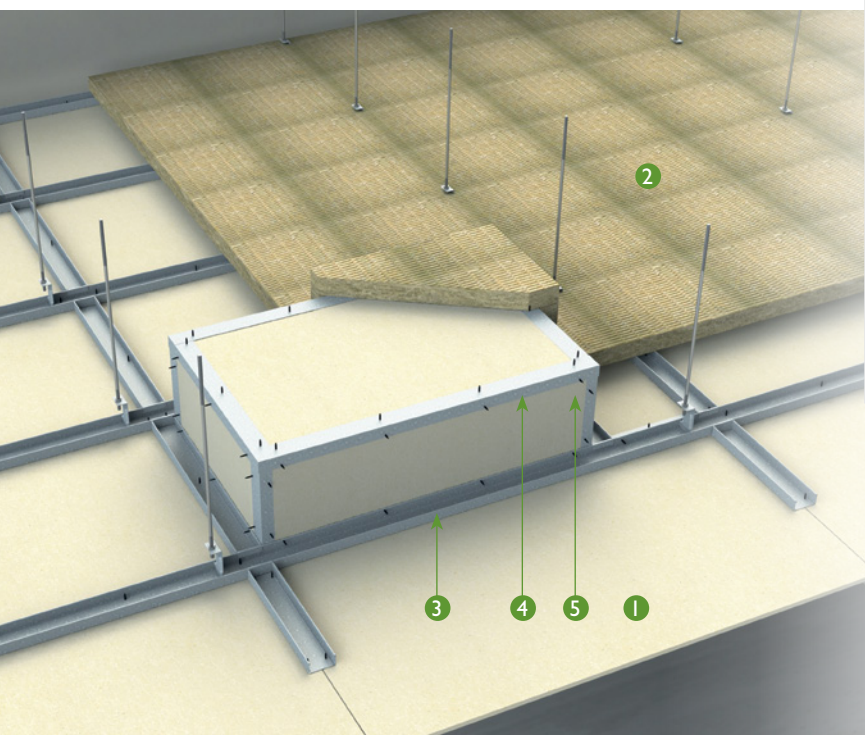
ACCESS PANEL



TECHNICAL DATA

- 1. FP®-900/FirePro® access panel
- 2. Ceiling framework
- 3. Panel fastened with M3.5 self-tapping screws or
- 4. M4 rivet nut and screw at nominal 200mm centres

RECESS FOR LIGHT FITTINGS



TECHNICAL DATA

- 1. FP®-900/FirePro® board
- 2. Stone wool insulation
- 3. Ceiling framework
- 4. Steel angle
- 5. M3.5 x 25mm self-tapping screws at nominal 200mm centres
- 6. Light fitting

FP®-Steel/FirePro®-S Loadbearing Floor - Type I FPSFI 60/120



FIRE RATING

FRL	Up to 120/120/120
Standard	BS 476: Part 21: 1987
Approval	Exova 364583

ACOUSTIC

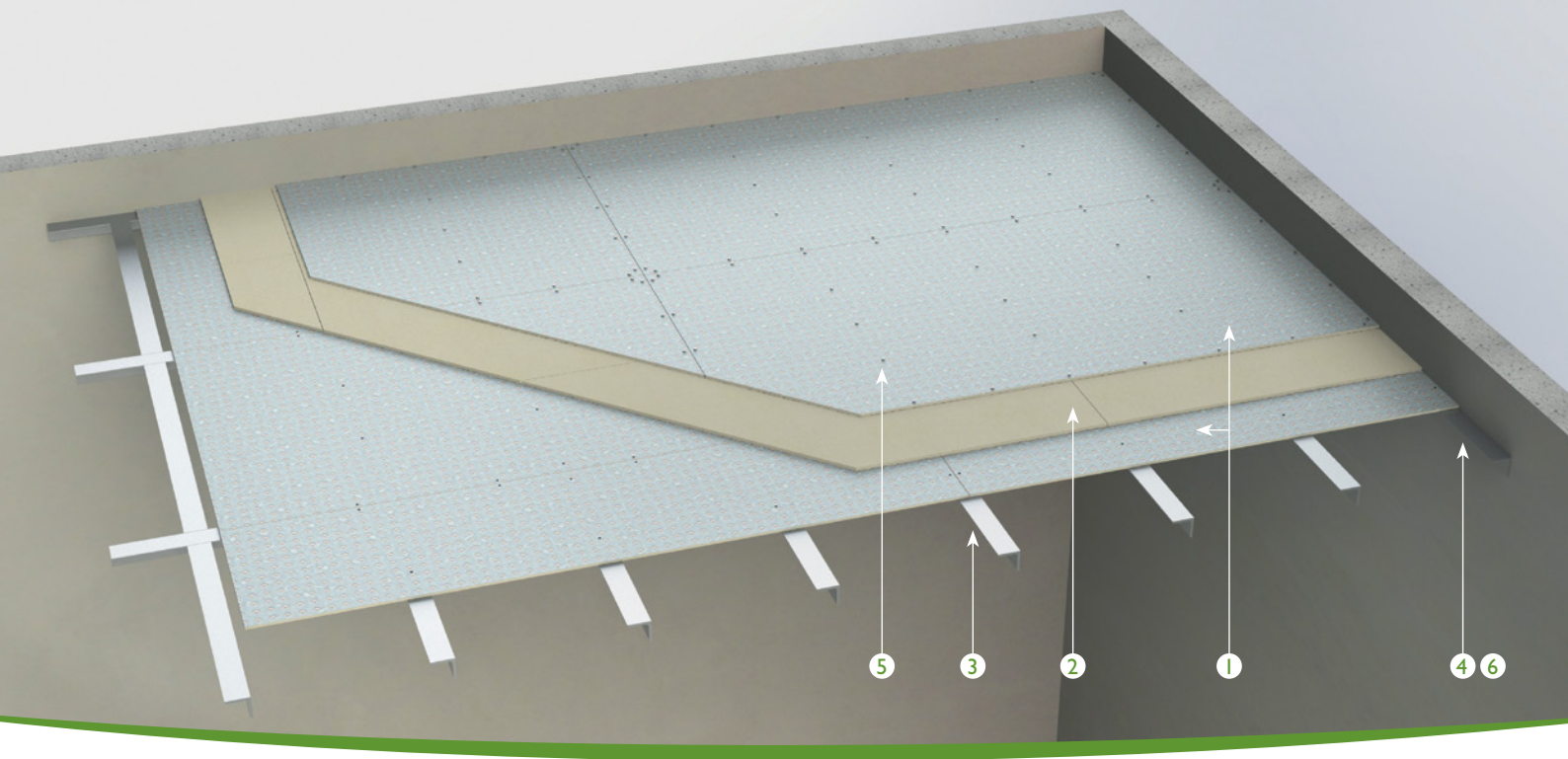
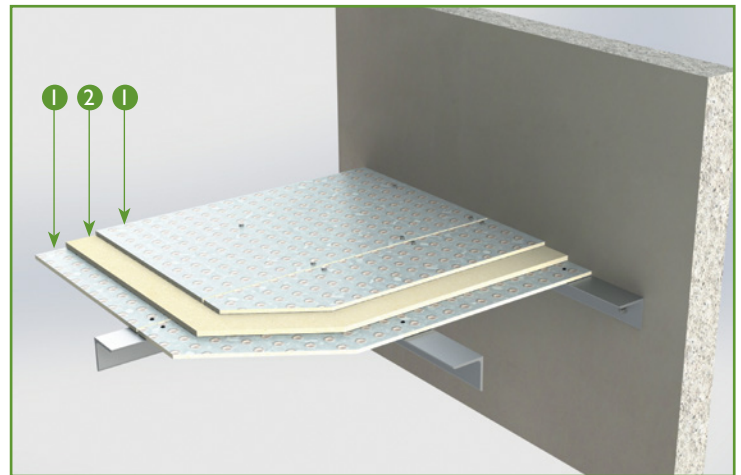
STC / Rw *	41 dB up
Standard	EN ISO 10140-2:2010 EN ISO 717-1: 2013
Assessment	Marshall Day - INSUL

SYSTEM

Floor deck thickness	28mm up
Surface mass	52 kg/m ² up

* STC / Rw values within +/-3dB

Fire attack from below or above



TECHNICAL DATA

- FP®-Steel/FirePro®-S boards - 9.5mm thick
- FP®-900/FirePro® board (refer to table LFI)
- Steel members with minimum 50mm flange width for the framework designed by a registered structural engineer
 - Main members at maximum 2400mm centres
 - Cross members at 600mm centres
 - Fire protection for the framework with FP®-900/FirePro® board or an approved fire protection material
- Perimeter steel member
- Fixing first-layer of boards with M5.5 countersunk head self-tapping screws at nominal 400mm centres Fixing top-layer of boards with M5.5 hexagon head washer faced self-tapping screws at nominal 300mm centres
- M10 steel anchors at maximum 500mm centres

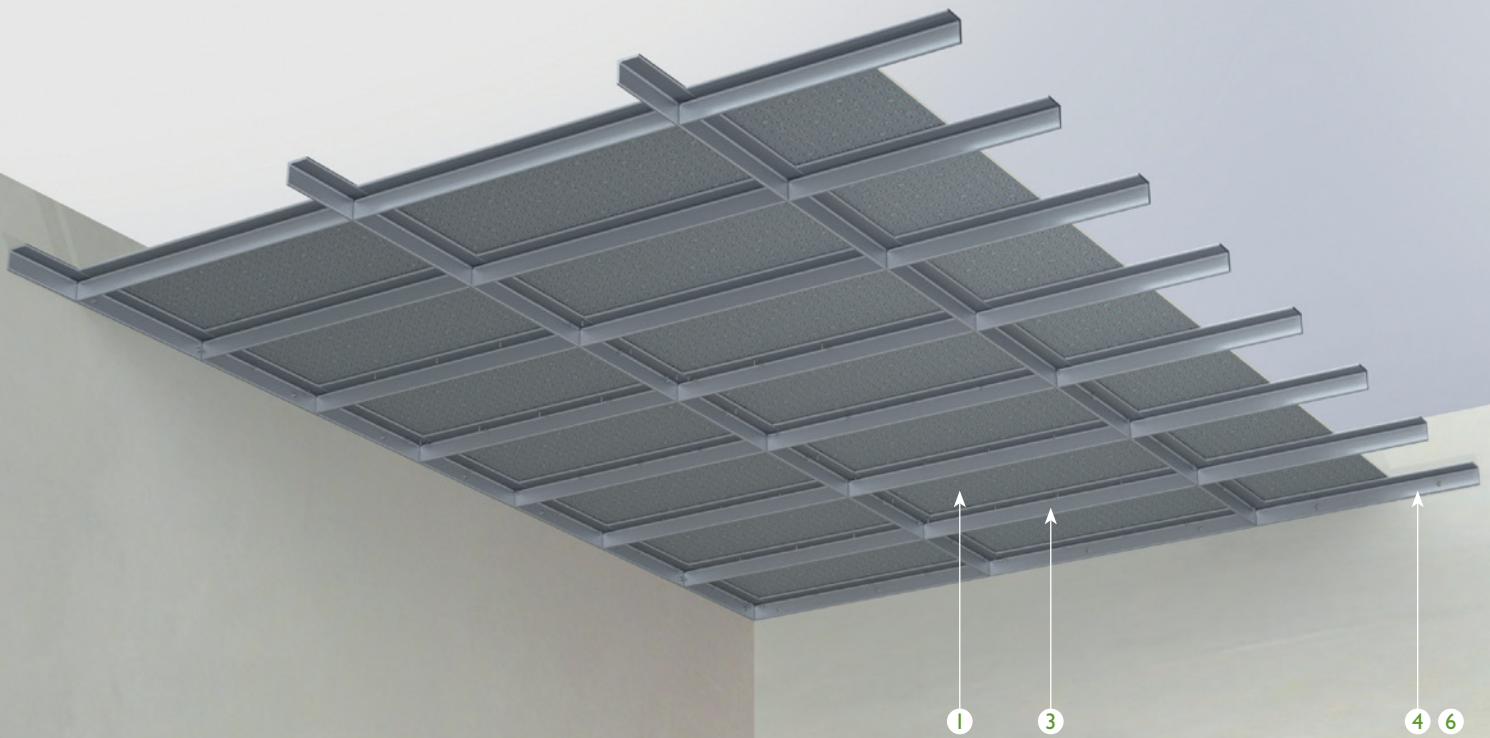
INSTALLATION

FP®-Steel/FirePro®-S blast and impact resistant loadbearing floor resist imposed loads up to 15kPa as well as fire attack up to 120 minutes with full insulation. The systems should be constructed in accordance with the approved specification mentioned in Table LFI below and the local building regulations (if required). For projects with specific requirements, please contact Soben International.

MINIMUM CONFIGURATION OF FP®-STEEL/FIREPRO®-S LOADBEARING FLOOR – TYPE I

TABLE LFI	LOADBEARING FLOOR - TYPE I			
	Fire rating - minutes	Imposed load - kPa	FP®-Steel/FirePro®-S	
number of layers at bottom			number of layers on top of FP®-900/FirePro®	
60	10	1	1	6 or 9
120	10	1	1	18 or 2 x 9
60	15	1	2	6 or 9
120	15	1	2	18 or 2 x 9

* Note: The floors meet criteria of loadbearing capacity, integrity and insulation.



FP®-Steel/FirePro®-S Loadbearing Floor - Type 2 FPSFII 120/180/240



FIRE RATING

FRL	Up to 240/240/240
Standard	BS 476: Part 21: 1987
Approval	Exova 360815 Fires FR-167-15-AUNE

ACOUSTIC

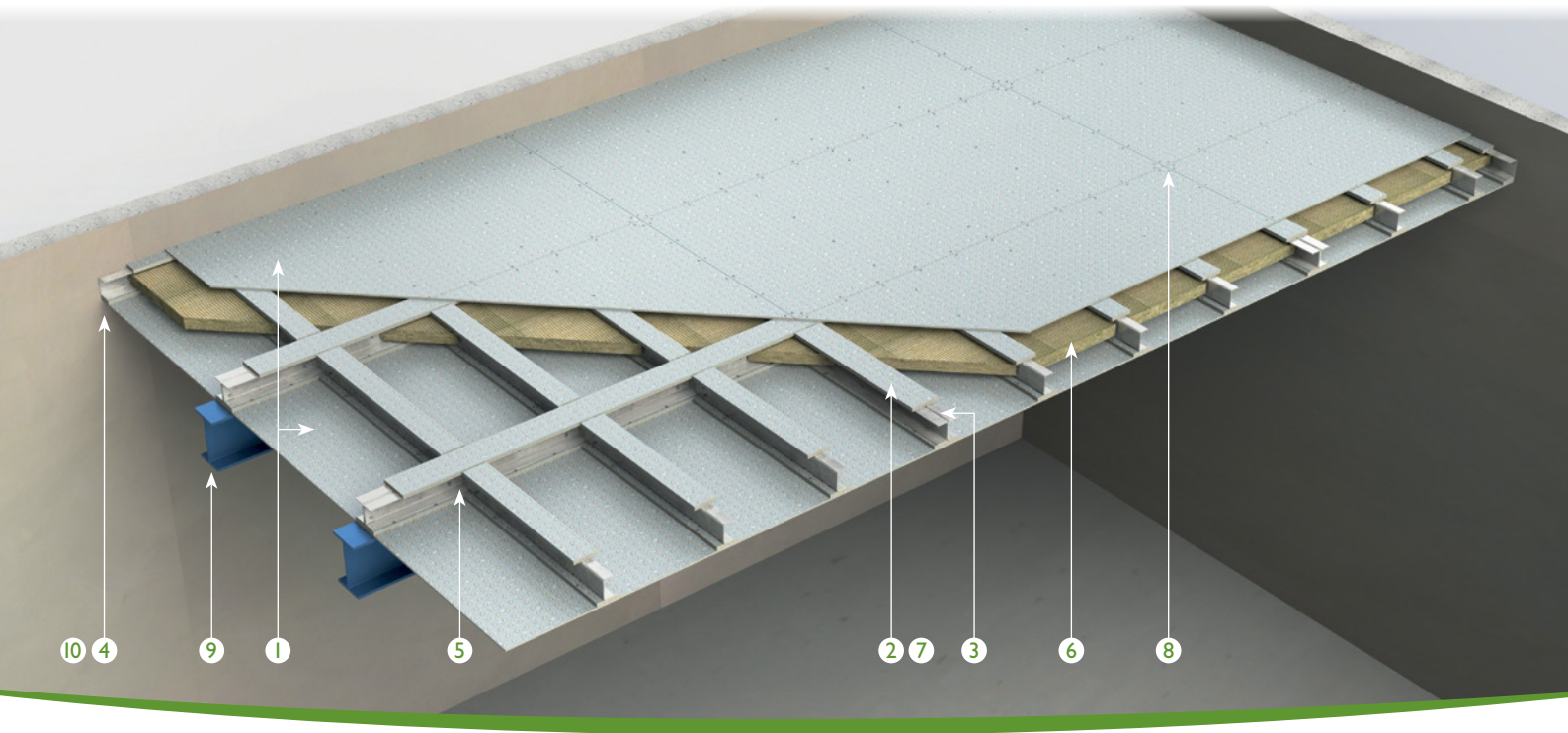
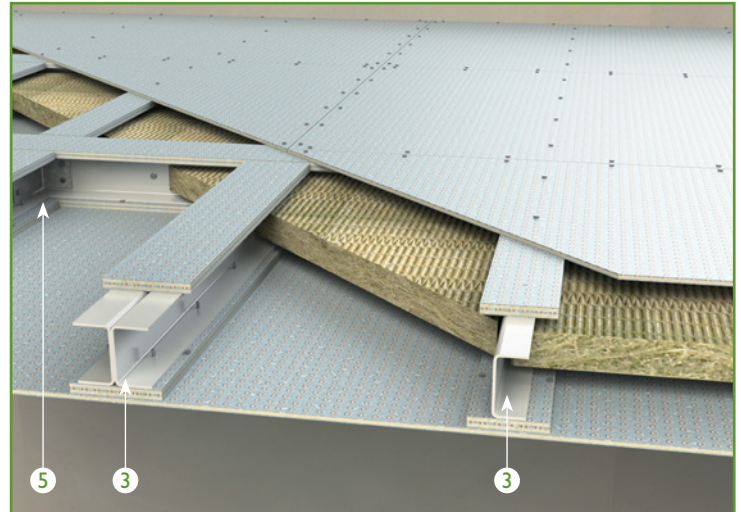
STC / Rw *	49 dB up
Standard	EN ISO 10140-2:2010 EN ISO 717-1: 2013
Assessment	Marshall Day - INSUL

SYSTEM

Floor deck thickness	137mm
Surface mass	92 kg/m ² up

* STC / Rw values within +/-3dB

Fire attack from below or above



TECHNICAL DATA

- FP®-Steel/FirePro®-S boards - 9.5mm thick
- FP®-Steel/FirePro®-S fillet – 9.5mm x 100mm wide
- Back-to-back channel of main and cross members, coincided with all board joints (refer to table LF2.2)
 - Main channels at maximum 2400mm centres
 - Intermediate cross channels at maximum 600mm centres
- Perimeter steel channel
- Steel angle cleat - 60 x 120 x 3mm thick for bolted or welded channel connection
- Stone wool
- Fixing fillets with M5.5 countersunk head self-tapping screws at nominal 400mm centres
- Fixing boards with M5.5 hexagon head washer faced self-tapping screws at nominal 300mm centres
- Floor beams at maximum 2400mm centres, protected with FP®-900/FirePro board an approved fire protection material
- M10 steel anchors at maximum 500mm

INSTALLATION

FP®-Steel/FirePro®-S blast and impact resistant loadbearing floors resist imposed loads up to 15kPa as well as fire attack up to 240 minutes with full insulation. These fire rated loadbearing floor systems should be constructed in accordance with the approved specification mentioned in Table LF2.1/LF2.2 and the local building regulations (if required). For projects with specific requirements, please contact Soben International.

MINIMUM CONFIGURATION OF FP®-STEEL/FIREPRO®-S LOADBEARING FLOOR – TYPE 2

TABLE LF2.1	MAIN CHANNELS AT MAXIMUM 1200MM CENTRES					
	Fire rating - minutes	Imposed load - kPa	FP®-Steel/FirePro®-S			*Channel web width - mm
number of fillets			number of layers at bottom	number of layers at top		
120	5	1 above & 1 below	1	1	70	80
120	10	1 above & 1 below	1	1	80	80
180	10	2 above & 2 below	1	1	80	120
180	15	1 above & 2 below	1	2	80	120
240	10	2 above & 2 below	1	1	80	120
240	15	1 above & 2 below	1	2	80	120

* Note: The floors meet criteria of loadbearing capacity, integrity and insulation.

Channel framework for Loadbearing Floor Type 2 up to 240 minutes of fire rating and imposed load up to 15 kPa

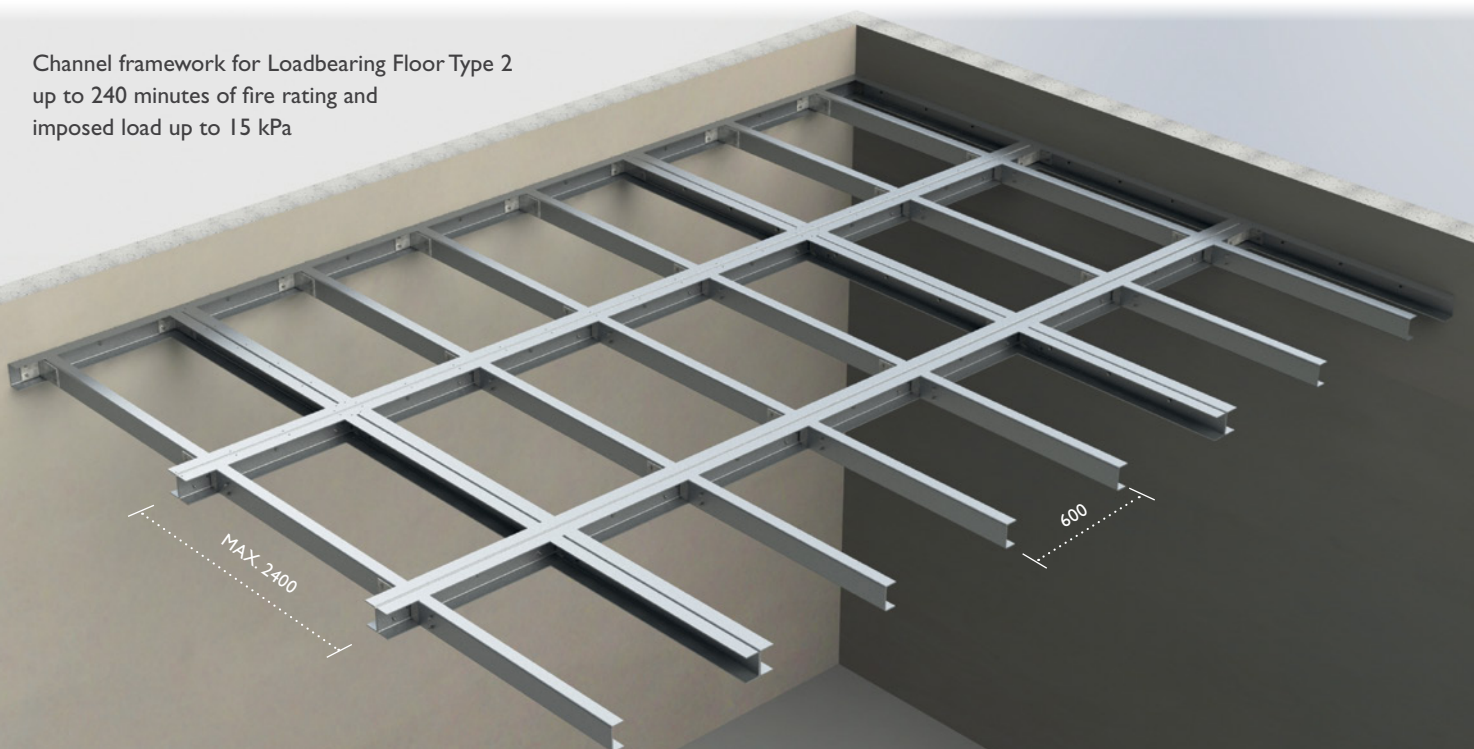
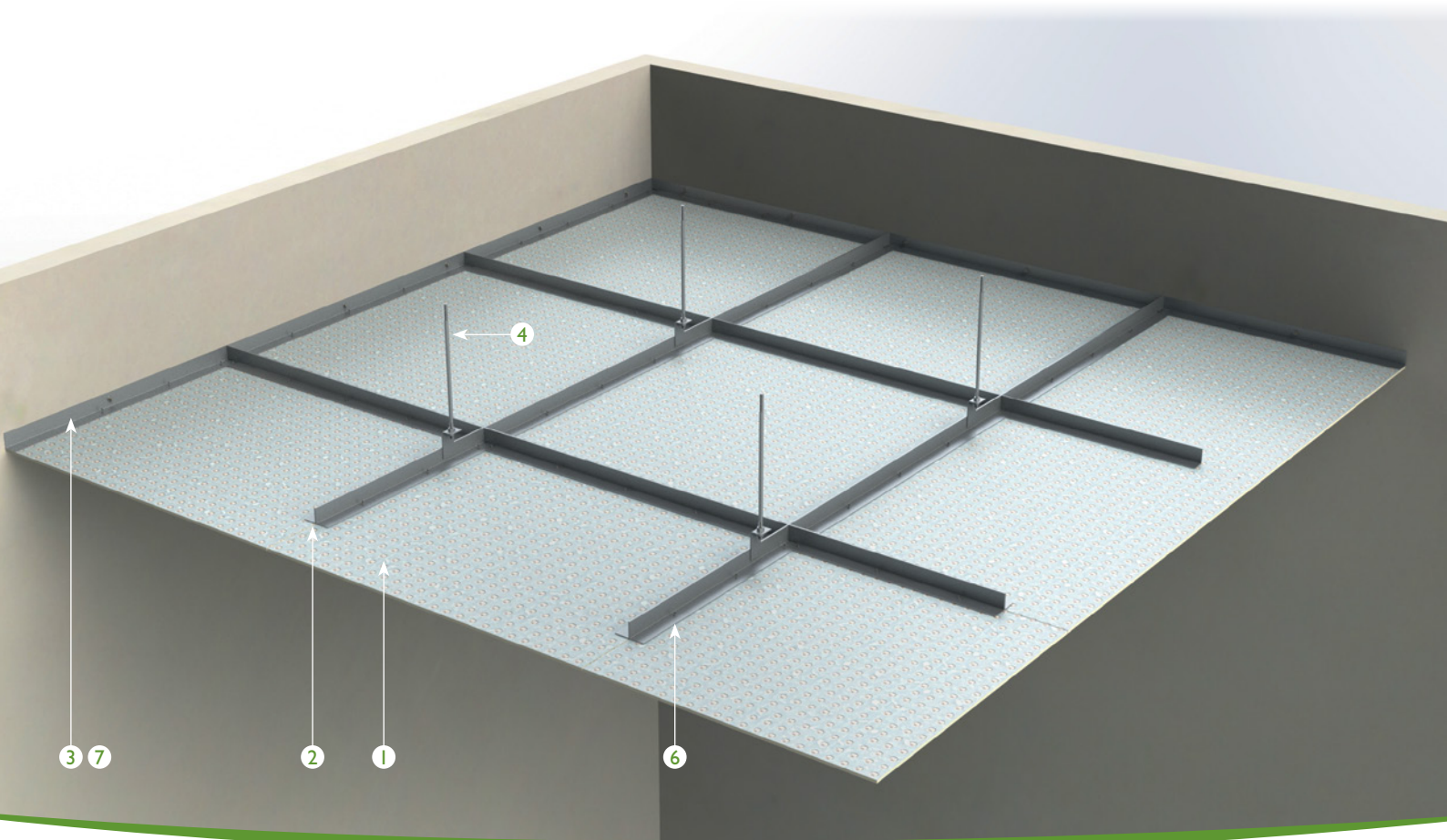


TABLE LF2.2		MAIN CHANNELS AT MAXIMUM 2400MM CENTRES				
Fire rating - minutes	Imposed load - kPa	FP®-Steel/FirePro®-S			*Channel web width - mm	Stone wool 140kg/m ³ x thickness - mm
		number of fillets	number of boards at bottom	number of boards at top		
120	3	1 above & 1 below	1	1	70	80
120	5	1 above & 1 below	1	1	80	80
120	7.5	1 above & 1 below	1	1	80 back-to-back	80
120	7.5	1 above & 1 below	1	1	100	80
120	10	1 above & 1 below	1	1	80 back-to-back	80
120	15	1 below	1	2	100 back-to-back	80
180	3	1 above & 1 below	1	1	70	120
180	5	2 above & 2 below	1	1	80	120
180	7.5	1 above & 2 below	1	1	80 back-to-back	120
180	7.5	2 above & 2 below	1	1	100	120
180	10	1 above & 2 below	1	1	80 back-to-back	120
180	15	1 above & 1 below	1	1	100 back-to-back	120
240	3	2 above & 2 below	1	1	80	120
240	5	1 above & 2 below	1	1	100	120
240	7.5	2 above & 2 below	1	1	80 back-to-back	120
240	10	1 above & 2 below	1	1	100 back-to-back	120
240	15	1 above & 2 below	1	2	120 back-to-back	120

* Note: All steel U-channels are 3mm thick and the flange width of the channels is 60mm. The back-to-back channels are fastened together with M8 bolts at 300mm centres or minimum 50mm long stitch welds top and bottom flanges at 250mm centres.

CEILING FRAMEWORK FOR FP®-STEEL/FIREPRO®-S SUSPENDED CEILING MEMBRANES

FP®-Steel/FirePro®-blast and impact resistant ceiling membrane system consists of a steel framework with threaded drop rods or steel angle members suspended from a structural floor slab or roof above. The framework members can be constructed with cold form channels or hot rolled L-angle sections. The main and cross members run along the ceiling at maximum 1200mm centres. The FP®-Steel/FirePro®-S boards are fastened to the framework by M5.5 self-tapping screws. All board joints coincide with the main and cross members.



TECHNICAL DATA

1. FP®-Steel/FirePro®-S boards - 9.5mm thick
2. Steel members
 - Main & cross back-to-back angles - 50 x 50 x 3mm at all board joints, intermediate cross angles with the same size at maximum 1200mm centres
 - Alternatively, main & cross U-channels - 60 x 80 x 60 x 3mm at maximum 1200mm centres
3. Perimeter steel angle - 50 x 50 x 3mm thick
4. Steel thread hanger rods at maximum 1200mm centres[#]
5. Steel angle cleat - 60 x 120 x 3mm thick for channel connections

6. Fixing boards with M5.5 hexagon head washer faced self-tapping screws at nominal 200mm centres
7. M8 steel anchors at 500mm centres

[#] Tensile stress limit not exceeding

fire rating	stress limit
60 minutes	15N/mm ²
120 minutes	10N/mm ²
180 minutes	8N/mm ²
240 minutes	6N/mm ²

FP®-Steel/FirePro®-S Suspended Ceiling Membrane FPS 240E



FIRE RATING

FRL	Up to -/240/-
Standard	BS 476: Part 22: 1987
Approval	BRE A250600 Exova DFL0181

ACOUSTIC

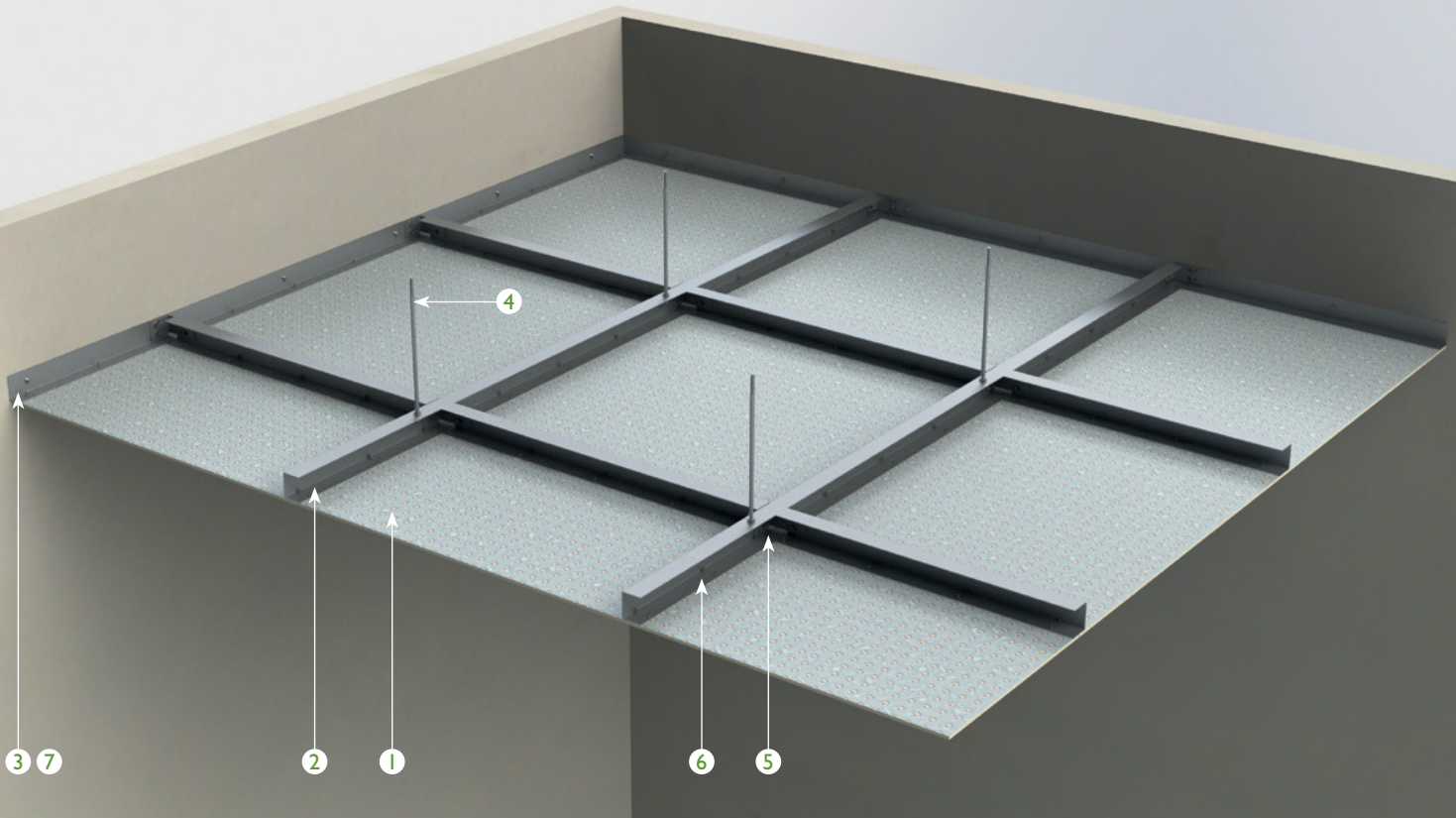
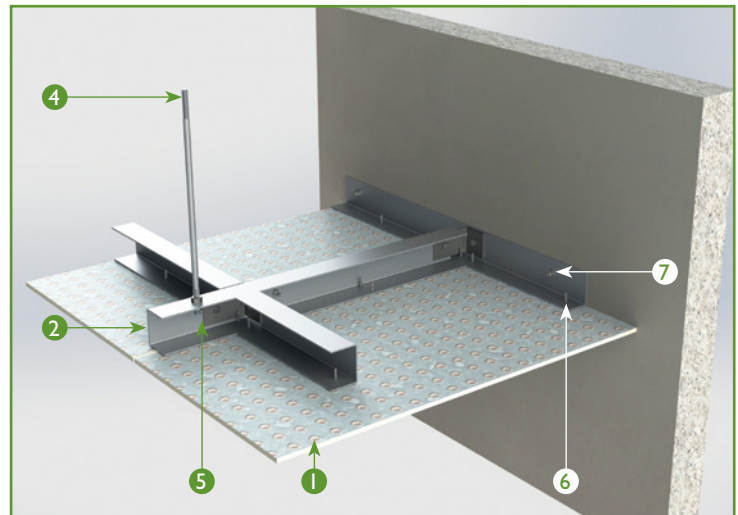
STC / Rw *	32 dB up
Standard	EN ISO 10140-2:2010 EN ISO 717-1: 2013
Assessment	Marshall Day - INSUL

SYSTEM

Ceiling thickness	59.5mm up
Ceiling mass	31.6kg/m ² up

* STC / Rw values within +/-3dB

Fire attack from below



INSTALLATION

FP®-Steel/FirePro®-S blast and impact resistant ceiling membrane should be constructed in accordance with the approved specification mentioned in the manufacturer's handbook & the local building regulation (if required).

FP®-Steel/FirePro®-S Self-supporting Ceiling Membrane FPSCS 180



FIRE RATING

FRL	Up to -/I80/I80
Standard	BS 476: Part 22: 1987
Approval	BRE A273892

ACOUSTIC

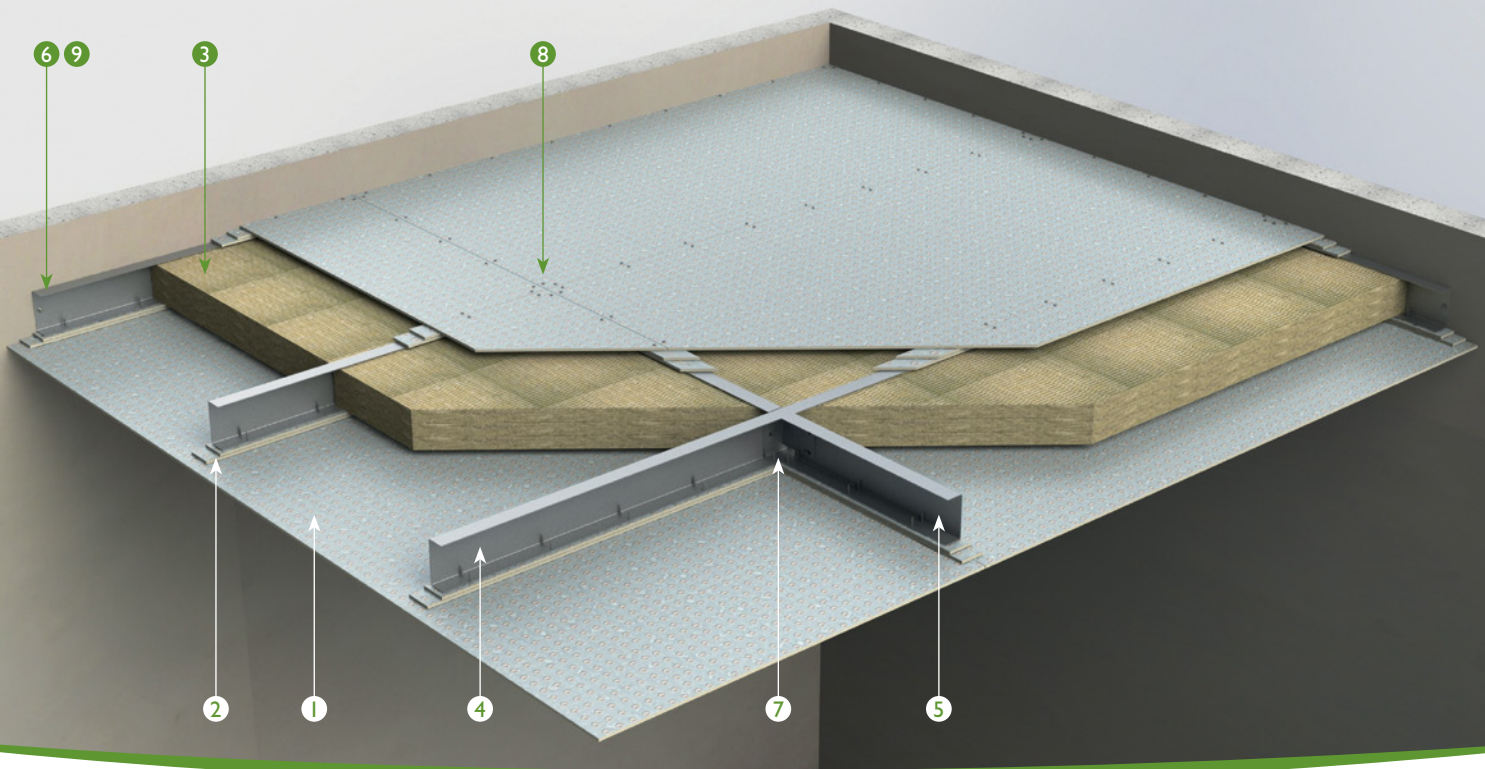
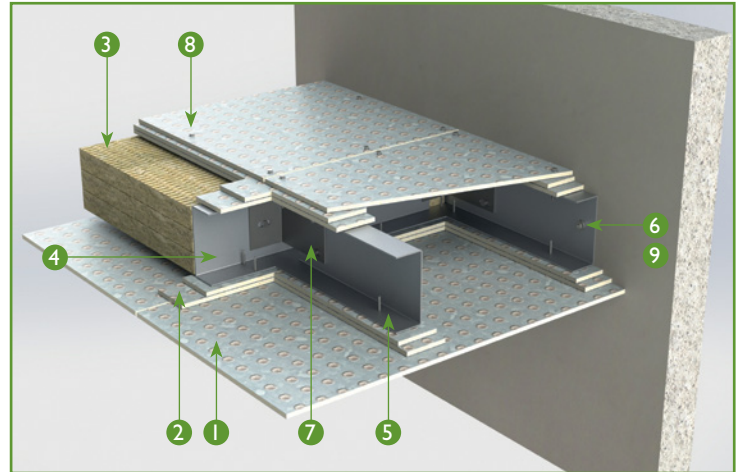
STC / Rw *	52 dB
Standard	EN ISO 10140-2:2010 EN ISO 717-1: 2013
Assessment	Marshall Day - INSUL

SYSTEM

Ceiling thickness	207mm
Ceiling mass	83 kg/m ²

* STC / Rw values within +/-3dB

Fire attack from below or above

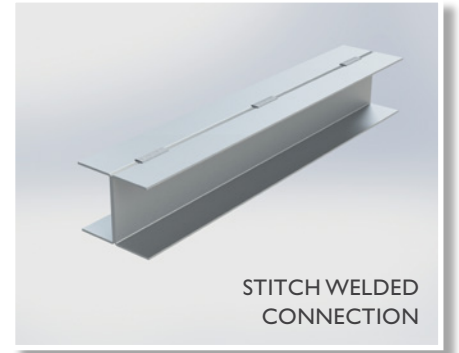
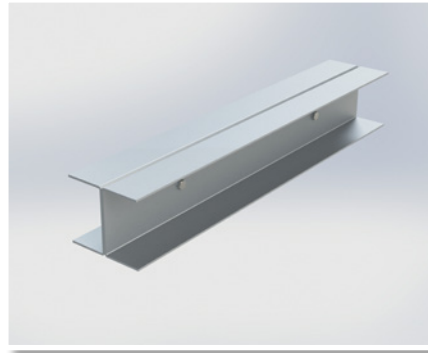
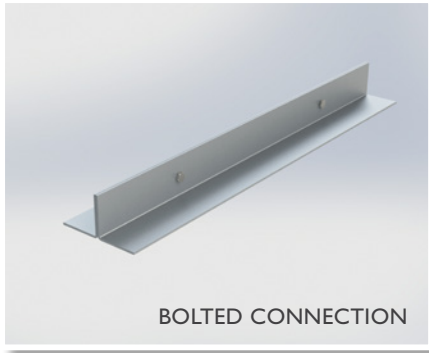


TECHNICAL DATA

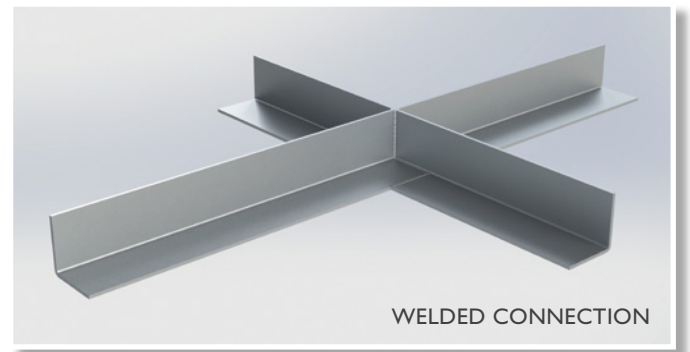
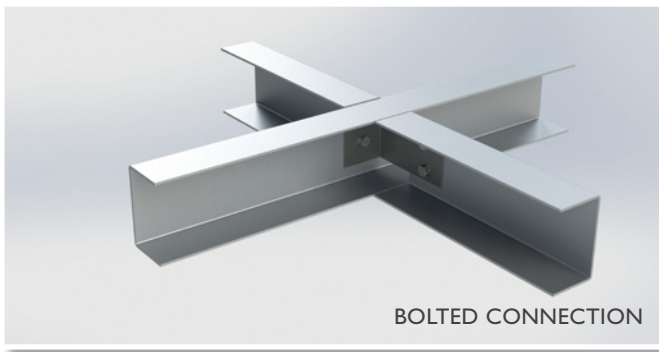
1. FP®-Steel/FirePro®-S boards - 9.5mm thick
2. FP®-Steel/FirePro®-S fillet - 100mm wide x 9.5mm thick x 2
3. Stone wool insulation 150mm thick x 140 kg/m³
4. Main steel U-channels - 60 x 150 x 60 x 3mm at maximum 1200mm centres
5. Cross steel U-channels - 60 x 150 x 60 x 3mm at maximum 2400mm centres screws at nominal 300mm centres
6. Perimeter U-channel - 60 x 150 x 3mm thick
7. Steel angle cleat - 60 x 120 x 3mm thick for channel connections
8. Fixing fillets with M5.5 countersunk head self-tapping screws at nominal 400mm centres Fixing boards with M5.5 hexagon head washer faced self-tapping screws at nominal 200mm centres
9. M10 steel anchors at 500mm centres

STEEL FRAMEWORK CONSTRUCTED WITH ANGLES OR CHANNELS

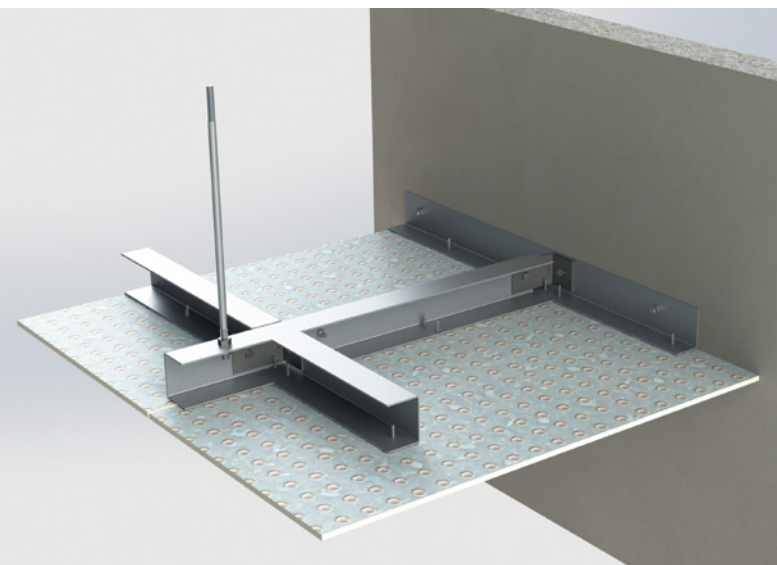
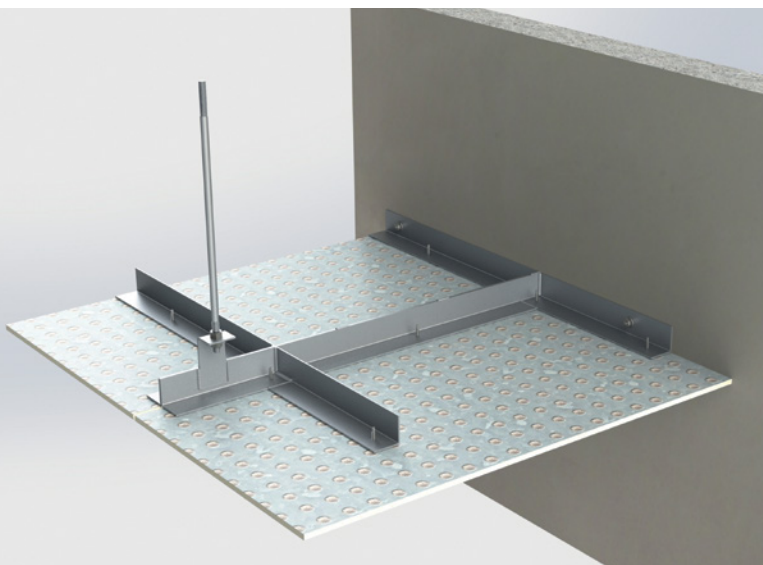
BACK-TO-BACK MAIN MEMBER



CROSS CONNECTION

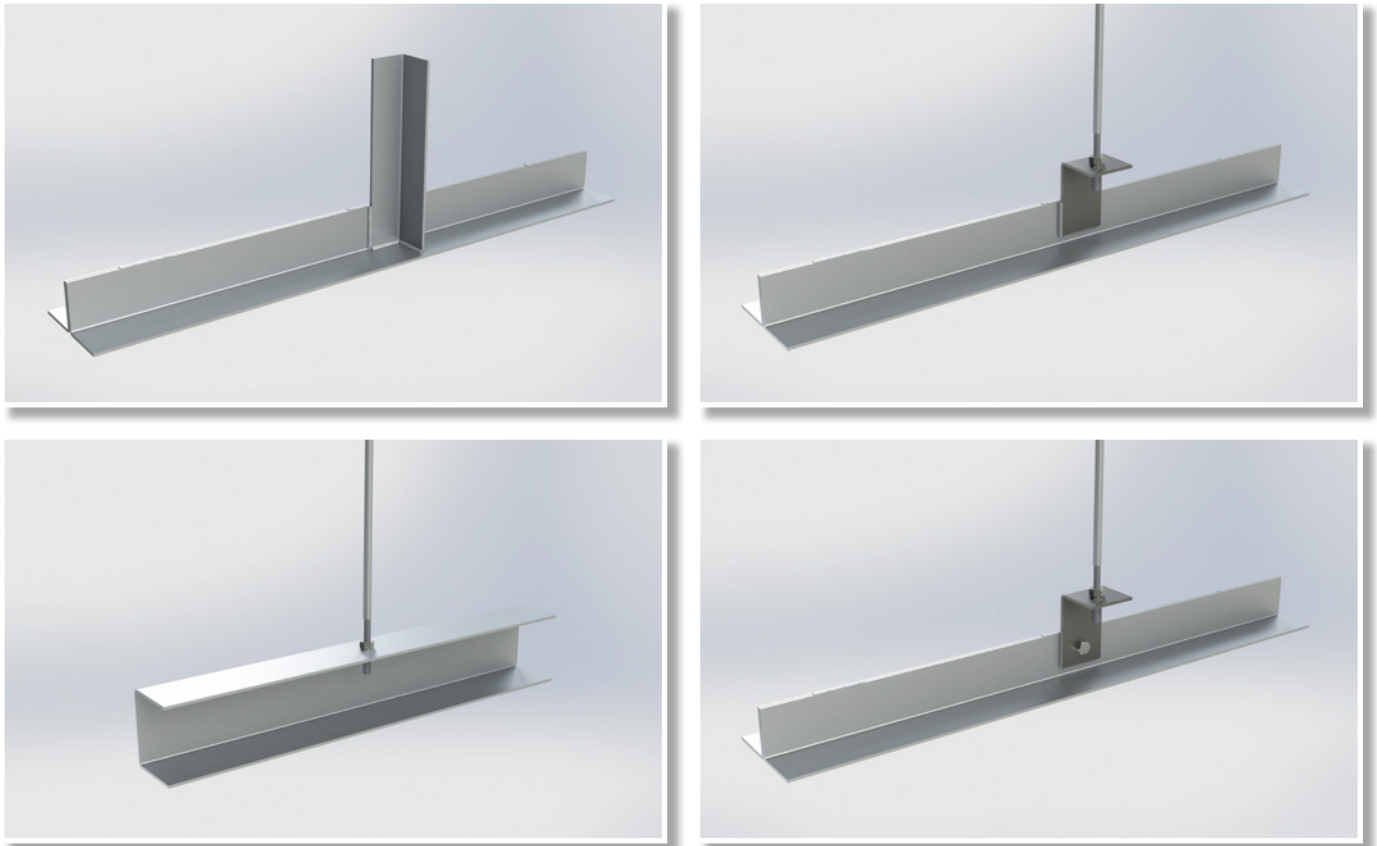


PERIMETER CONSTRUCTION

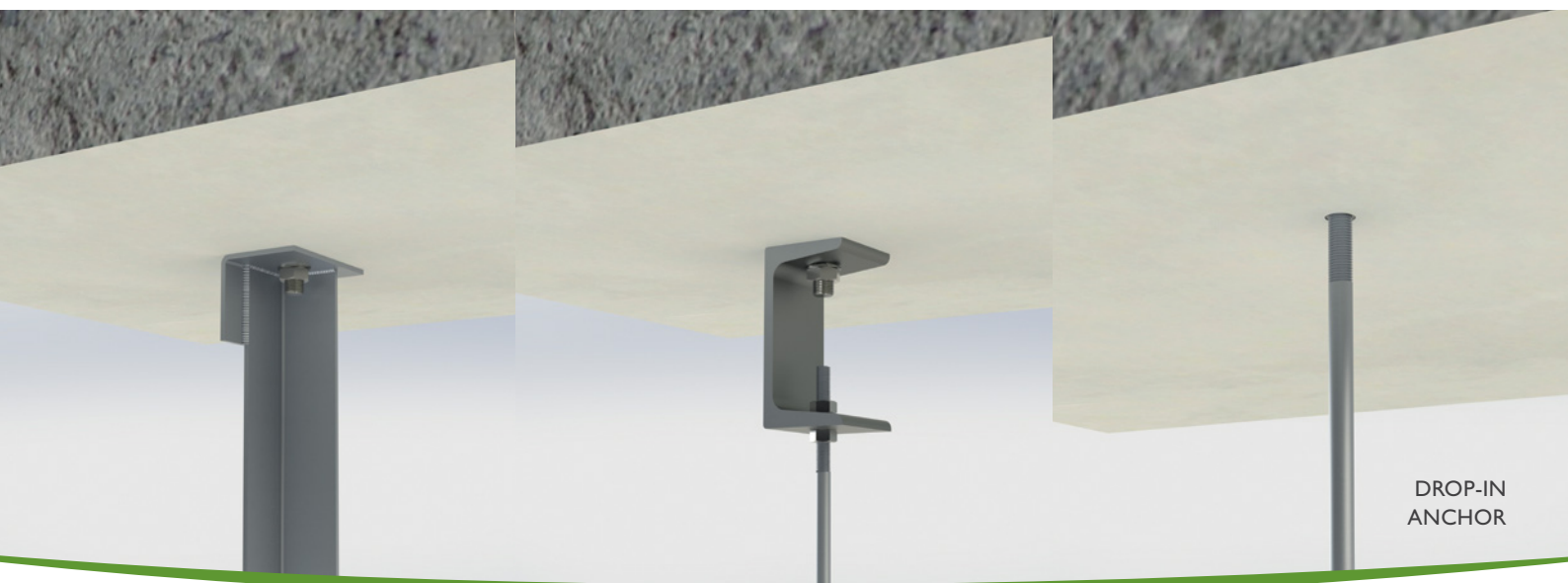


SUSPENSION HANGER DETAILS

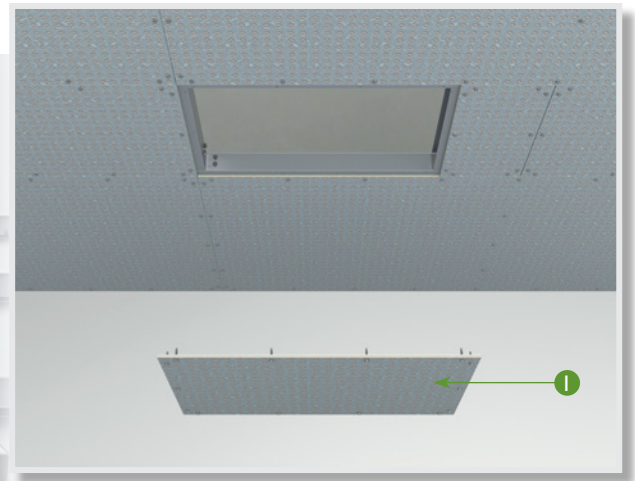
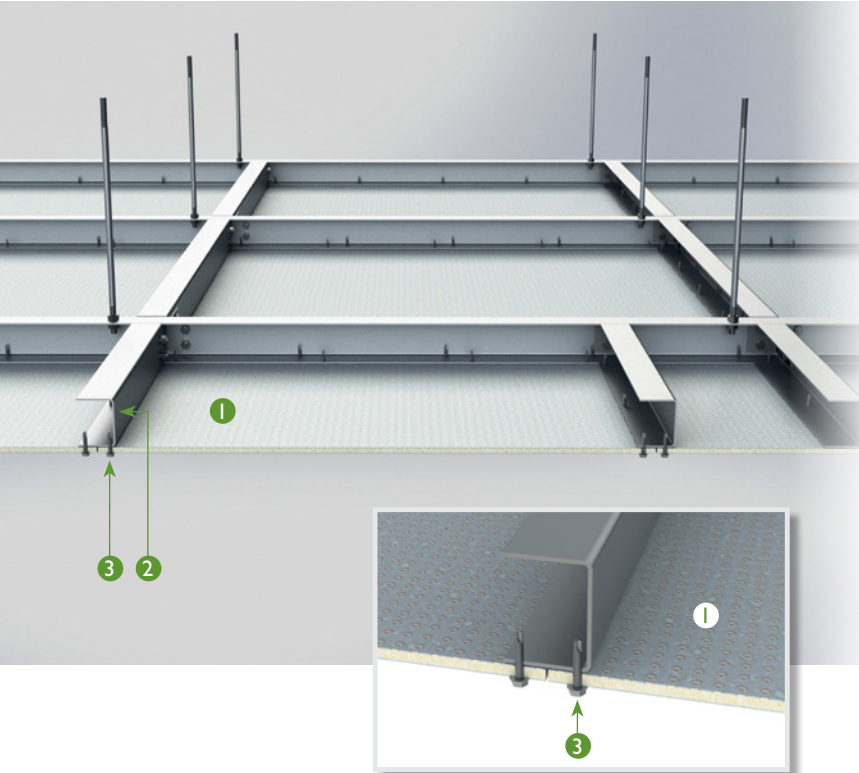
HANGERS CONNECTED TO STEEL MEMBERS



HANGERS ATTACHED TO A CONCRETE SLAB ABOVE



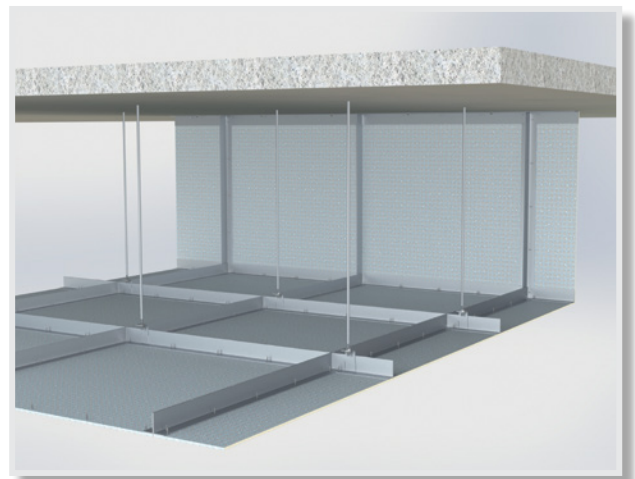
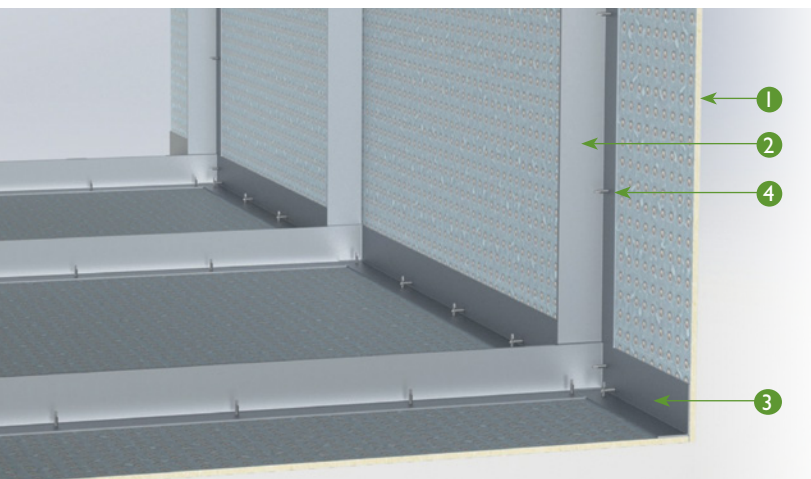
ACCESS PANEL



TECHNICAL DATA

1. FP®-Steel/FirePro®-S access panel
2. Ceiling framework
3. Panel fastened with M5.5 self-tapping screws at nominal 200mm centres

VERTICAL RETURN



TECHNICAL DATA

1. FP®-Steel/FirePro®-S board
2. Ceiling framework
3. Steel angle
4. M5.5 × 35mm self-tapping screws at nominal 200mm centres
5. M8 steel anchors at maximum 500mm centres



SOBEN INTERNATIONAL

HONG KONG

Soben International (Asia Pacific) Ltd

Tel: +852 3173 2683 Fax: +852 3173 2688

Email: international@sobenboard.com

www.sobenboard.com

N. IRELAND. UK

Soben International (Europe)

Tel: +44 78 9423 0583

Email: europe@sobenboard.com

SINGAPORE

Soben International (Singapore)

Tel: +65 9680 6132

Email: sg@sobenboard.com

PERTH, WA

Soben International (Australia)

Tel: +61 (0)4 1532 3888

Email: aus@sobenboard.com

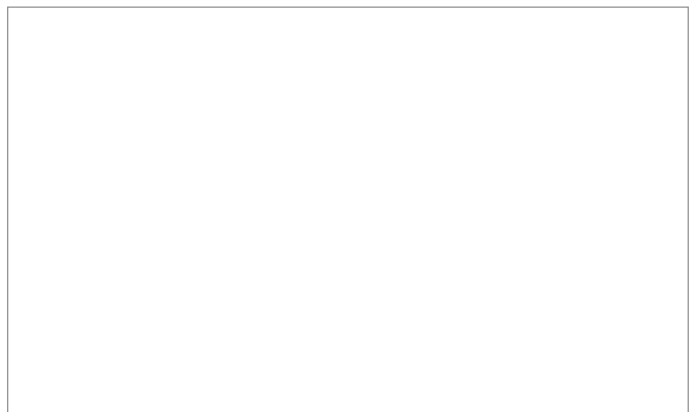
INCHEON, KOREA

Soben International (Korea)

Tel: +82 10 9015 5750

Email: kor@sobenboard.com

Your Local Distributor



SALES IN HONG KONG & MACAU REGIONS

Supreme Ecoform Limited

Tel: +852 3741 2689 Fax: +852 3741 2690

Email: info@hkseco.com