Promat

Compartmentation

Fire resistant ceilings

Building & construction solutions

Technical manual

Singapore version

www.promat.com

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Contents

Compartmentation: Keeping the fire within it is original source

Efficient compartmentation is proven to be the best solution to contain fire and avoid it spreading throughout the building. Promat offers architects, engineers and installers a wide range of fire boards that combine ease of installation with exceptional fire resistance to construct fire resistant ceilings, floors and partitions. In certain layouts as required, complete the compartment with fire resistant glass and fire doors to create compartments that will keep the fire within the fire source and as a result ensure tenable conditions for safe evacuation, limit the spread of fire beyond it source hence protect further damage of property.

Compartmentation

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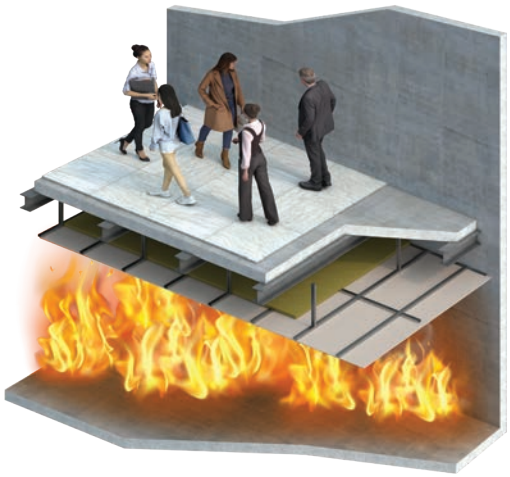
Fire attack from above and below



Protection to structural loading bearing floor

Protection for escape route

Protection for escape route - staircase

Fire Resistant Ceilings

While fire resistant partitions are elements for vertical fire separation, Fire Resistant Ceilings forms the horizontal separation of compartmentation. Depending on the compartment design, fire resistant ceilings can be employed to reduce the volumetric cubical content of a compartment, resisting fire either from above or below, segregate ceiling spaces from escape routes, contribute to fire protection to structural loading bearing floors, and where needed suitably designed to provide a level of trafficability.

This handbook collates a wide range of fire resistant ceilings, tested to various internationally recognised standards, including and not limited to:

BS 476: Part 22 - Fire tests on building materials and structures. Methods for determination of the fire resistance of non-load bearing elements of construction.

BS 476: Part 23 - Fire tests on building materials and structures. Methods for determination of the contribution of components to the fire resistance of a structure.

EN 1364-2 - Fire resistance tests for non-loadbearing elements - Part 2: Ceilings.

EN 1365-2 - Fire resistance tests for loadbearing elements - Floors and roofs.

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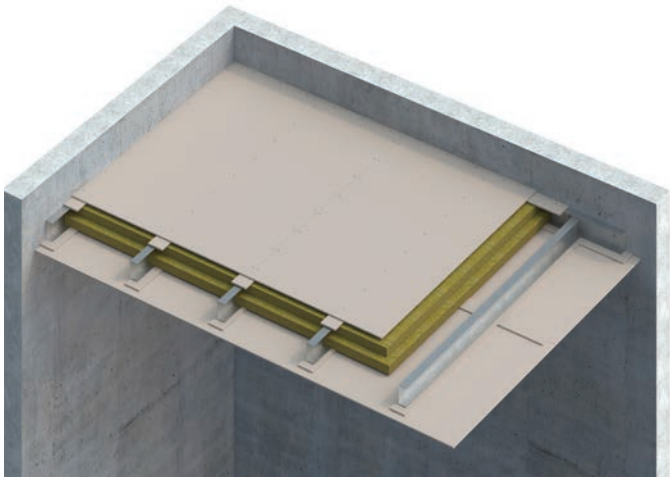
Types of Fire Resistant Ceiling Constructions

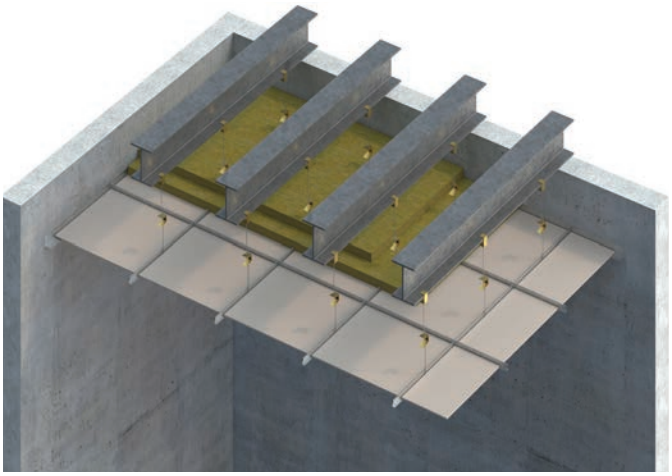


Self-supporting Membrane Ceilings

Where fire separation to subdivide a voluminous compartment horizontally is required, self-supporting membrane ceilings are most suitable. The ceiling is hanger free, depending on the construction can be symmetrical or asymmetrical, permit one of two sided access. For access to the spaces above or below, a Promat fire resistant access hatch can be fitted as required. Depending on the site, the level of trafficability can also be built-in to allow maintenance access.

Suspended Membrane Ceilings

For situations where the ceiling void permits a suspended ceiling, these ceiling membranes are easy to install from the bottom. Attention should be given to the suspension height, preferably not exceeding 2m and ensure the hangers are braced to provide a rigid support to the fire resistant ceiling. Promat has also thoroughly tested a suspended tee-grid system where Promat boards are laid as ceiling tiles.



Trafficable ceiling systems

Project requirements where installation is only possible from the top is not uncommon. The steel support framework should firstly be duly fire protected, and Promat fire resistant boards are laid with non-coinciding butt joints to construct a fire resistant ceiling that is easy & fast to install. Where appropriate with properly design steel supports, a level of trafficability can be built-in.

Suspended Ceiling Protection To Steel Beams

Floors supported on structural steel can employ fire resistant ceiling to ensure the structural beams are capable of resisting fire from below and simultaneously maintaining its structural integrity to support the load bearing floor element above.

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General Design Considerations

Following are some of the factors to consider when determining correct specifications that ensure a ceiling provides the required design performance, under both fire and ambient conditions. Comprehensive advice is available from local Promat offices.

Supporting Structure Design

The design of the framing system should be adequate for the design loads of the ceiling. Promat systems are designed for timber or steel framing as described in the system specification.

For steel framed ceiling systems, it is critical to precisely follow the dimensions of the steel sections, the grid spacing, the suspension members (if any) and the fastening methods employed. Framing members could change depending on factors such as ceiling span, movement and deflection, and local regulations.

Larger or more frequent frame sections can often improve the fire and structural performance. The framing for the ceiling systems must be securely fixed back to a substrate that has an equal or greater fire performance than the ceiling. All fixings must be non-combustible and must be similar to those listed in the approval documents.

Supporting ceiling framework

The steel framing as noted in the system specification is appropriate for the given span. Larger dimension of steel sections or more frequent spacing will be required for a ceiling span larger than specified.

At wall connections, mechanical joints are required and these joints must be carefully designed so that they accommodate the required expansion of steel at elevated temperature.

Non loadbearing ceilings in this handbook are not trafficable. Trafficable ceilings for maintenance purposes can be designed and installed. Please consult Promat for complete information.

Acoustics

Promat ceiling and floor systems also meet specific acoustic requirements. These include ratings for sound transmission, sound impact and sound absorption.

Board Fixing

Longitudinal board joints must coincide with framing members. If the boards are in one layer, the transverse joints must be backed with fillet strips made of Promat boards or timber noggings for traditional timber joist construction. For boards laminated in two layers, the joints must be staggered by at least 600mm.

Promat boards may be fixed to the steel members using No.8 bugle head self-drilling and self-tapping screws. No.8 wood screws shall be used to fix boards to a timber frame. For boards laminated in two layers, the outer layer boards may be stitched to the preceding layer with No. 10 laminating screws. PROMATECT®-S may be fixed to the steel framework using M5.5 self-tapping/drilling Teks screws.

Minimum edge distance to fasteners and the maximum spacing between screws must be maintained. Please refer to system details for screw spacing requirements.

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Movement Joint

Movement stress from dimensional changes due to varying temperature or moisture conditions can cause cracking and other symptoms of distress in ceiling linings.

Other external forces such as impact or vibration can directly affect structural movement of ceilings. This movement can be controlled through a variety of design techniques such as introducing perimeter relief and slip connections to reduce the transfer of stress from the structure to other building sub elements and/or through the use of expansion joints, control joints and construction joints.

Expansion joints are needed when a ceiling abuts a rigid mass. Where ceiling dimensions exceed 10m in either direction, a control joint should be used. Control joints should also be located to intersect column penetrations, light fixtures and air diffusers. It is however, the introduction of a control joint into a fire resistant system when an opening for flame and temperature transmission is created. This and similar openings have to be properly treated with approved fire stopping materials from Promat.

Caulking & Service Penetrations

To maintain fire performance and, where applicable, acoustic performance of ceiling systems, perimeter and other gaps must be appropriately filled with suitable caulking material. PROMASEAL®-A Acrylic Sealant or other tested fire and acoustic rated material of equivalent or better performance must be used.

Care needs to be taken in detailing a suitable fire stopping system around any penetration of the ceiling by services to ensure:

a) the fire stopping material remains in-situ,

b) fire and smoke do not penetrate the floor cavity,

c) and a premature collapse of the joists and/or penetration of fire and smoke through the time flooring does not occur.

Allowance should be made for thermal movement of the services in both ambient and fire conditions to ensure unacceptable loads are not applied to the ceiling assembly. Some examples of service penetrations include penetrations by electrical cables, conduits or wires, plastic and metal pipes, air conditioning and ventilation ductwork. Further guidance on the sealing of service penetrations can be obtained from the PENETRATION SEALS section.

Light Fittings

Light fittings located within a ceiling cavity should normally be enclosed in an adequately supported fire protection box to prevent fire spreading rapidly into the ceiling cavity. Most light fittings will require ventilation in normal use and this consideration should certainly be factored into light box design. Please consult Promat for details.

Access Panels & Hatches

Where access into a ceiling void is required, panels and hatches will need to be installed. Please refer to page 35 or consult Promat for details.

Impact Resistance

PROMATECT®-H offers a particularly robust system which is highly resistant to impact and abrasion. The high strength of PROMATECT®-S permits light loads such as the foot traffic of maintenance personnel. PROMATECT®-S ceiling systems are highly resistant to impact and provide excellent resistance to high pressure hose streams during fire.

Conclusion

Most building regulations stipulate limitations on the use of fire protecting suspended ceilings in certain situations. Care should be therefore taken that the use of a suspended ceiling system is acceptable to the approval authorities.

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PROMATECT®-H

Fire protective construction board

Material properties	
General description	Calcium Silicate board made with Mineral Matrix Engineering technology
Surface condition & appearance	Off-white colour Front face: smooth Back face: sanded
Nominal dry density (average)	Approx. 975kg/m³
Moisture Content	Approx. 6.0% The moisture content varies and will reach an equilibrium over time with the atmospheric relative humidity of the environment
Alkalinity	pH 12
Thickness tolerance	Compliant with thickness tolerance of CE requirements (9mm thick standard sheets, +/-0.5mm)
Dimension tolerance	±5mm (standard board dimensions)

Product description

PROMATECT®-H is a non-combustible calcium silicate board manufactured under Promat's proprietary Mineral Matrix Engineering Technology. It does not contain formaldehyde or any asbestos. The product is dimensionally stable and resistant to the effects of moisture. Its performance characteristics are not degraded by moisture PROMATECT®-H has the following intended uses (according to EAD[1] 350142-00-1106): internal use (type Z2), internal use in high humidity conditions (type Z1) and external semi-exposed use (type Y). For fully exposed conditions, consult Promat Technical Department.

EAD[1]: European Assessment Document

Manufacturing Certification

PROMATECT®-H is manufactured under a quality management system certified in accordance with ISO 9001:2015. The manufacturing site is also certified to meet the environmental standards of ISO 14001:2015 and the occupational health & safety requirements of ISO 45001:2018.

Fire Resistant Applications

- → Structural steel fire protection
- → Internal drywalls
- → Internal lining to external walls
- → Suspended and self-supporting hanger free ceilings
- → Self-supporting airduct or cladding to steel sheet metal ducts
- → Enclosures to E&M services
- → Smoke screens
- → Flame barrier
- → Parapet & spandrel walls
- → Upgrading fire performance of
  - Reinforced concrete
  - Masonry construction

Static Values			
Modulus of Elasticity E	**Flexural Strength** F	**Tensile strength** T	**Compressive strength** ⊥
Longitudinal: 4.1kN/mm² Transverse: 4.0kN/mm²	Longitudinal: 10N/mm² Transverse: 7N/mm²	Longitudinal: 4.11N/mm² Transverse: 2.15N/mm²	9.3N/mm²

Reaction to Fire & Thermal Properties		
Combustibility	**Surface burning**	**Thermal conductivity**
A1 Classification: EN 13501-1 Non-combustible: BS 476: Part 4	Class O: BS 476: Part 6 & 7	0.242W/m°K

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PROMATECT®-H

Fire protective construction board

Standard thickness	Standard dimension	Number of boards per pallet	Surface area per pallet	Weight of standard sheet	Weight per pallet
9mm	2440mm x 1220mm	61	181.5m²	Approx. 29kg	Approx. 1,888kg
12mm	2440mm x 1220mm	46	136.9m²	Approx. 39kg	Approx. 1,896kg
15mm	2440mm x 1220mm	36	107.3m²	Approx. 49kg	Approx. 1,858kg
20mm	2440mm x 1220mm	27	80.4m²	Approx. 65kg	Approx. 1,859kg
25mm	2440mm x 1220mm	22	65.4m²	Approx. 82kg	Approx. 1,890kg

All physical and mechanical values are averages based on standard production and tested according to internal procedures. The typical values are given for guidance. The figures can change dependent on the test methods used. If a particular value is of prime importance for a specification, please consult Promat Technical Department.

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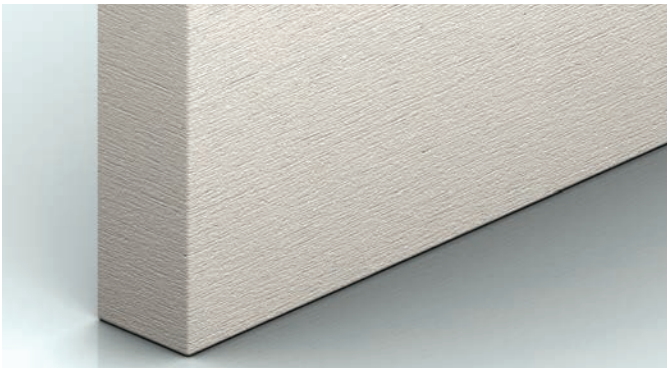
PROMATECT®-L500

Matrix engineered mineral board



Material properties	
General description	Matrix Engineering mineral board
Surface condition & appearance	Off-white colour Front face: smooth sanded Back face: lightly honeycombed texture
Nominal dry density (average)	Approx. 500kg/m³
Moisture Content	Approx. 3.9% The moisture content varies and will reach an equilibrium over time with the atmospheric relative humidity of the environment
Alkalinity	pH 9
Thickness tolerance	±0.5mm (standard board dimensions)
Dimension tolerance	±5mm (standard board dimensions)

Product description

PROMATECT®-L500 is a lightweight matrix engineered mineral board. The product is chemically inert and is resistant to diluted acids and alkalis, thus the boards should be protected where high chemical concentrations are likely to occur.

PROMATECT®-L500 is off-white or beige in colour. The front face is smooth sanded; the reverse face is in lightly honeycombed texture. Decoration on the boards can be achieved with paints or tiles.

PROMATECT®-L500 is resistant to effects of moisture and will not physically deteriorate in a damp or humid environment. The product does not encourage mould growth and is resistant to attack by vermin. Whilst its performance characteristics are not degraded by moisture or aging, untreated board surfaces will absorb water which can cause some loss of strength but strength is regained after drying.

Fire Resistant Applications

- → Cladding to steel ducts, self-supporting ducts
- → M&E services enclosure
- → Floor lift motor room hatches

Static Values			
Modulus of Elasticity E	**Flexural Strength** F	**Tensile strength** T	**Compressive strength** ⊥
Longitudinal: 1209N/mm² Transverse: 1667N/mm²	Longitudinal: 1.46N/mm² Transverse: 2.42N/mm²	Longitudinal: 1.00N/mm² Transverse: 1.26N/mm²	4.04N/mm²

Reaction to Fire & Thermal Properties	
Combustibility	**Thermal conductivity**
A1 Classification: EN 13501-1	0.095W/m°K

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PROMATECT®-L500

Matrix engineered mineral board

Standard thickness	Standard dimension	Number of boards per pallet	Surface area per pallet	Weight of standard sheet	Weight per pallet
20mm	2500mm x 1200mm	43	129m²	Approx. 31.8 kg	Approx. 1,367kg
25mm	2500mm x 1200mm	35	105m²	Approx. 39.6 kg	Approx. 1,386kg
30mm	2500mm x 1200mm	30	90m²	Approx. 47.7 kg	Approx. 1,431kg
35mm	2500mm x 1200mm	25	75m²	Approx. 55.5 kg	Approx. 1,387kg
40mm	2500mm x 1200mm	21	63m²	Approx. 63.6 kg	Approx. 1,335kg
50mm	2500mm x 1200mm	17	51m²	Approx. 79.5 kg	Approx. 1,351kg
52mm	2500mm x 1200mm	16	48m²	Approx. 82.7 kg	Approx. 1,248kg

All physical and mechanical values are averages based on standard production and tested according to internal procedures. The typical values are given for guidance. The figures can change dependent on the test methods used. If a particular value is of prime importance for a specification, please consult Promat Technical Department.

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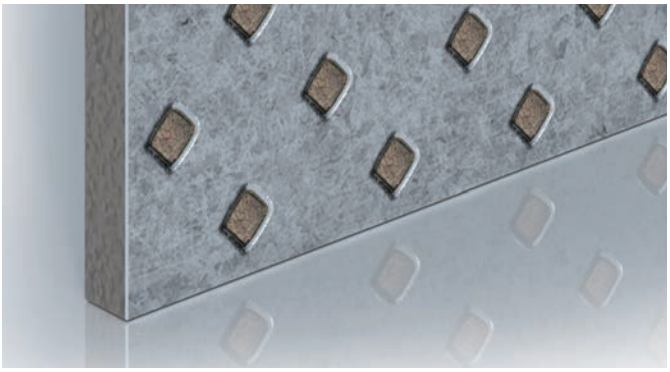
PROMATECT®-S

Cement-steel composite board



Material properties	
General description	Cement-steel composite board
Surface condition & appearance	Galvanised steel with fibre cement core
Nominal dry density (average)	2470kg/m³ (6mm board) 2280kg/m³ (9.5mm board)
Moisture Content	7% (6mm board) 8% (9.5mm board)
Thickness tolerance	-1mm, +2mm (6mm board) -1mm, +1.5mm (9.5mm board)
Dimension tolerance	±5mm (standard board dimensions)

Static Values	
Modulus of Elasticity E	**Flexural Strength** F
414G/Pa (6mm board) 199G/Pa (9.5mm board)	333N/mm² (6mm board) 351N/mm² (9.5mm board)

Product description

PROMATECT®-S is a composite board manufactured with a fibre reinforced cement core, with outer facings of 0.5mm perforated galvanised steel mechanically bonded to each surface of the core. Other steel finishes such as stainless steel are also available for use where greater resistance to corrosion is required.

PROMATECT®-S fire resistant application systems have been used successfully for a few decades, including rail and metro projects, military facilities and in commercial, pharmaceutical and petrochemical plants. These applications combine lightness, strength, impact resistance and durability with exceptional fire resistance performance. They remain resistant to firefighter hoses leaving the board capable of performing their function should fire services be required to withdraw before a fire is extinguished.

Fire Resistant Applications

- → Steel stud partitions
- → Self-supporting membrane ceilings
- → Suspended ceilings
- → Cladding to steel ducts, self-supporting ducts
- → M&E services enclosure
- → Smoke barrier
- → Access panels and hatches

Reaction to Fire & Thermal Properties		
Combustibility	**Surface burning**	**Thermal conductivity**
A1 Classification: EN 13501-1 Non-combustible: BS 476: Part 4	Class O: BS 476: Part 6 & 7	0.179W/m°K

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PROMATECT®-S

Cement-steel composite board

Standard thickness	Standard dimension	Number of boards per pallet	Surface area per pallet	Weight of standard sheet	Weight per pallet
6mm	2400mm x 1200mm	30	90m²	Approx. 45.0 kg	Approx. 1,350kg
9.5mm	2400mm x 1200mm	25	75m²	Approx. 63.0 kg	Approx. 1,575kg

All physical and mechanical values are averages based on standard production and tested according to internal procedures. The typical values are given for guidance. The figures can change dependent on the test methods used. If a particular value is of prime importance for a specification, please consult Promat Technical Department.

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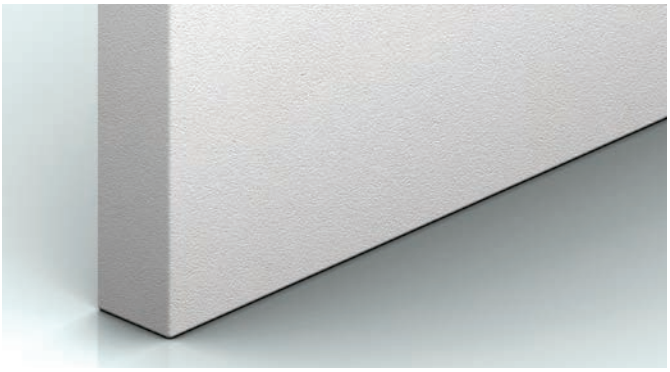
PROMATECT®-100

Calcium silicate board



Material properties	
General description	PROMAXON® mineral board
Surface condition & appearance	Off white colour Front face: smooth Back face: sanded
Nominal dry density (average)	850kg/m³
Moisture Content	Approx. 12.72% The moisture content varies and will reach an equilibrium over time with the atmospheric relative humidity of the environment
Alkalinity	Approx. pH 9
Thickness tolerance	±0.5mm (standard thickness board)
Dimension tolerance	±0-3mm (standard board dimensions)

Product description

PROMATECT®-100 comprises autoclaved calcium silicate spheres (PROMAXON® is a synthetic hydrated calcium silicate in spherical form) bound in a mineral matrix. PromaX® technology provides excellent fire performance in most applications.

PROMATECT®-100 is off-white in colour. One face is smooth and ready to form a finished surface, able to receive almost any form of architectural/finish treatment. The reverse face is sanded.

PROMATECT®-100 is resistant to the effects of moisture and will not physically deteriorate when used in damp or humid conditions. Performance characteristics are not degraded by age or moisture. However, PROMATECT®-100 is not designed for use in areas subject to continual damp or high temperatures. PROMATECT®-100 is for internal applications only.

Fire Resistant Applications

- → Structural Steel Protection
- → Partition & External Walls
- → Ceilings & Floors
- → Access Panels & Hatches

Static Values		
Flexural Strength F	**Tensile strength** T	**Compressive strength** ⊥
Longitudinal: 4.5N/mm²	Longitudinal: 1.02N/mm² Transverse: 0.98N/mm²	5.99N/mm²

Reaction to Fire & Thermal Properties	
Combustibility	**Thermal conductivity**
A1 Classification: EN 13501-1	0.164W/m°K

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PROMATECT®-100

Calcium silicate board

Standard thickness	Standard dimension	Number of boards per pallet	Surface area per pallet	Weight of standard sheet	Weight per pallet
8mm	2500mm x 1200mm	50	150m²	Approx. 22.8 kg	Approx. 1140kg
10mm	2500mm x 1200mm	40	120m²	Approx. 27.8 kg	Approx. 1110kg
12mm	2500mm x 1200mm	30	90m²	Approx. 34.0 kg	Approx. 1020kg
15mm	2500mm x 1200mm	25	75m²	Approx. 40.4 kg	Approx. 1010kg
18mm	2500mm x 1200mm	20	60m²	Approx. 48.3 kg	Approx. 965kg
20mm	2500mm x 1200mm	20	60m²	Approx. 53.5 kg	Approx. 1070kg
25mm	2500mm x 1200mm	15	45m²	Approx. 67.3 kg	Approx. 1010kg

All physical and mechanical values are averages based on standard production and tested according to internal procedures. The typical values are given for guidance. The figures can change dependent on the test methods used. If a particular value is of prime importance for a specification, please consult Promat Technical Department.

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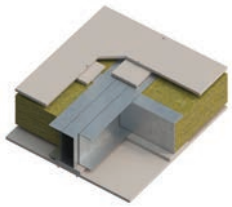
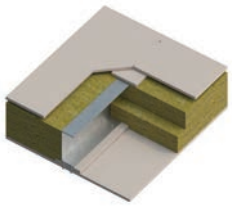
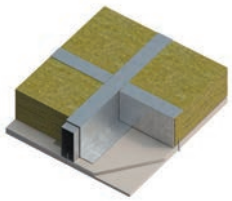
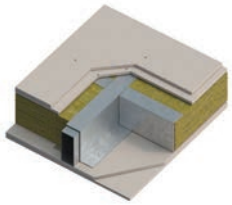
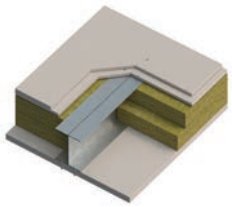
Self-supporting ceiling membranes

Ceiling type	Model number	Fire resistance performance	Test standard	Page no.
 PROMATECT®-H 2-hour fire rated	PH.14.12	-/120/120	BS 476: Part 22: 1987	20
 PROMATECT®-H 2-hour fire rated	PH.14.12.EN	-/120/120	EN 1364: Part 2: 2018	21
 PROMATECT®-H 2-hour fire rated	PH.14.12-A	-/120/120	BS 476: Part 22: 1987	22
 PROMATECT®-H 4-hour fire rated (Type 1)	PH.14.24	-/240/240	BS 476: Part 22: 1987	23
 PROMATECT®-H 4-hour fire rated (Type 2)	PH.14.24	-/240/240	BS 476: Part 22: 1987	24

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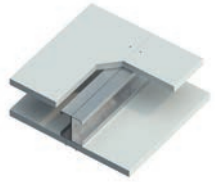
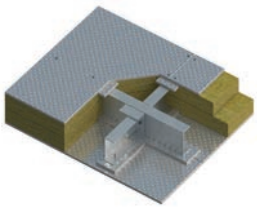
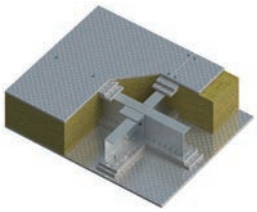
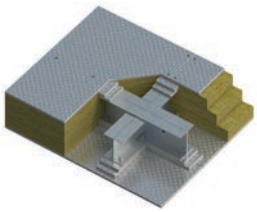
Self-supporting ceiling membranes

Ceiling type	Model number	Fire resistance performance	Test standard	Page no.
 PROMATECT®-L500 2-hour fire rated	PE.14.12	-/120/120	EN 1364: Part 2	25
 PROMATECT®-S 2-hour fire rated	PS.14.12	-/120/120	BS 476: Part 22: 1987	26
 PROMATECT®-S 4-hour fire rated	PS.14.24	-/240/240	BS 476: Part 22: 1987	27

Self-supporting ceiling membrane (Hydrocarbon)

Ceiling type	Model number	Fire resistance performance	Test standard	Page no.
 PROMATECT®-S 2-hour fire rated (Hydrocarbon)	PS.14.12-HC	-/120/120	BS 476: Part 22: 1987	28

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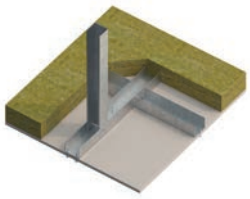
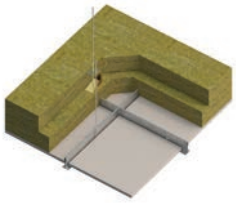
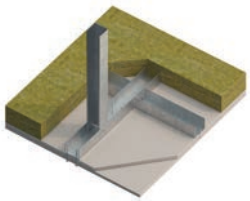
Solid ceiling membrane system

Ceiling type	Model number	Fire resistance performance	Test standard	Page no.
 PROMATECT®-H 2-hour fire rated	PH.15.12-A	-/120/120	BS 476: Part 22: 1987	29

Suspended ceilings

Ceiling type	Model number	Fire resistance performance	Test standard	Page no.
 PROMATECT®-H 1-hour fire rated	PH.14.60-S	-/60/60	BS 476: Part 22: 1987	30
 PROMATECT®-H 1.5-hour fire rated (Exposed Grid)	PH.14.90-T.EN	-/90/90	EN 1364: Part 2	31
 PROMATECT®-H 2-hour fire rated	PH.14.12-S	-/120/120	BS 476: Part 22: 1987	32

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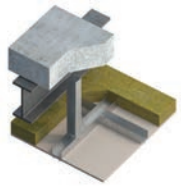
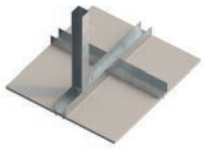
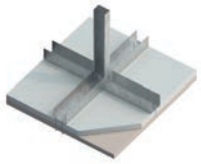
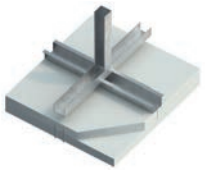
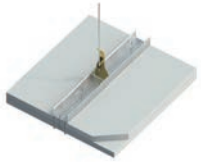
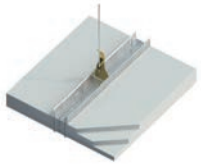
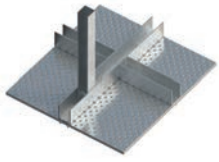
Suspended ceilings

Ceiling type	Model number	Fire resistance performance	Test standard	Page no.
 PROMATECT®-H 2-hour fire rated (Steel beam underneath floor slab)	PH.12.12-S	-/120/120	BS 476: Part 23: 1987	33
 PROMATECT®-H 4-hour fire rated (Integrity only)	PH.14.24.E-S	-/240/-	BS 476: Part 22: 1987	34
 PROMATECT®-H & Promat SLIM & LIGHT 3 & 4-hour fire rated	PH+P-SL.14S.18 EN PH+P-SL.14S.24 EN	-/180/180 -/240/240	EN 1364: Part 2	35
 PROMATECT®-L500 4-hour fire rated	PE.14.24-S	-/240/240	BS 476: Part 22: 1987	36
 PROMATECT®-100 1.5-hour fire rated	P100.14.90-S	-/90/90	EN 1364: Part 2	37
 PROMATECT®-100 2-hour fire rated	P100.14.12-S	-/120/120	EN 1364: Part 2	38
 PROMATECT®-S 4-hour fire rated (Integrity only)	PS.14.24.E-S	-/240/-	BS 476: Part 22: 1987	39

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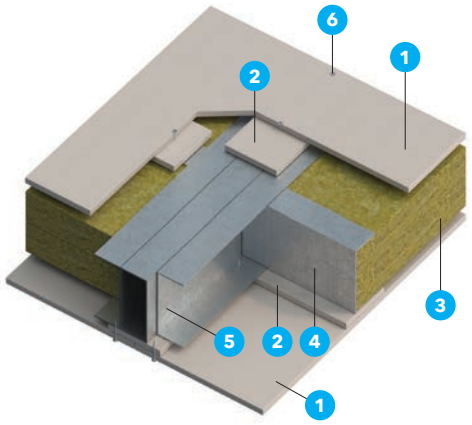
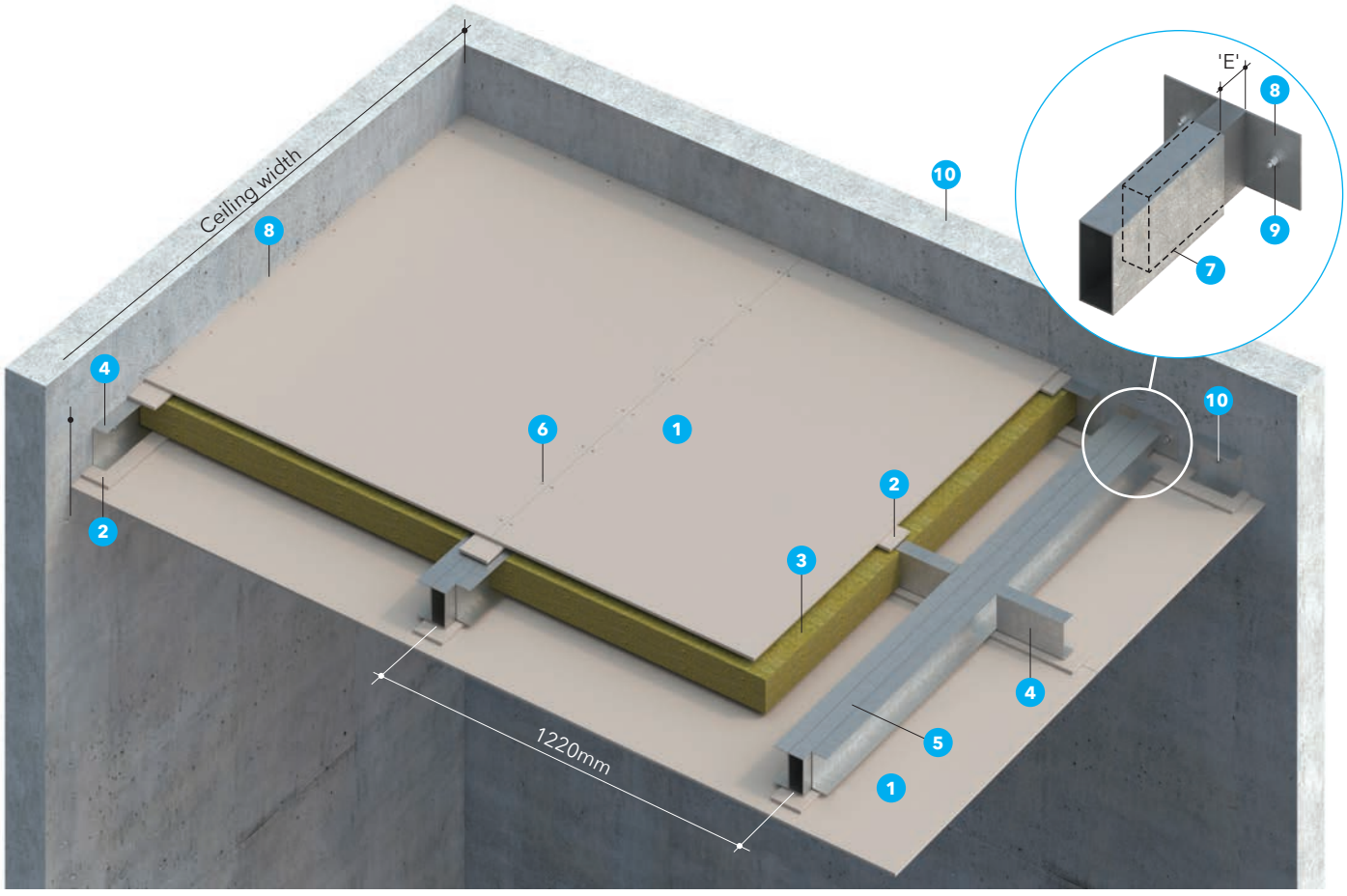
PROMATECT®-H 2-hour fire rated self-supporting ceiling



Fire Resistance	FRL	-/120/120	Model number: PH.14.12
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	48 47dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



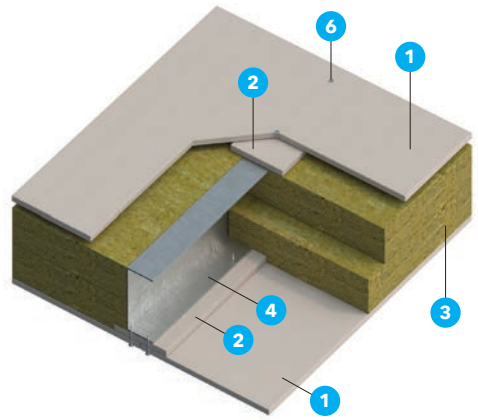
1. One layer of PROMATECT®-H 9mm thick.
2. PROMATECT®-H cover strips 100mm wide x 9mm thick.
3. Mineral wool 80mm x 100kg/m^3 or 100mm x 80kg/m^3 (staggered joints min 300mm between layers):
4. Intermediate steel channel U100 x 50 x 0.6mm thick at 610mm centres.
5. Main support RHS 100 x 50 x 3mm at max. 1220mm centres for ceiling width up to 3m.
6. M4 self-tapping screws at 200mm centres.
7. RHS bracket fully welded to note 8.
8. Steel plate min 3.0mm thick.
9. M 12 anchor bolts to fix note 8.
10. M6 anchor bolts at 600mm centres.
11. Masonry wall.

FRL (hour)	Expansion gap 'E'
2	10.7mm/m

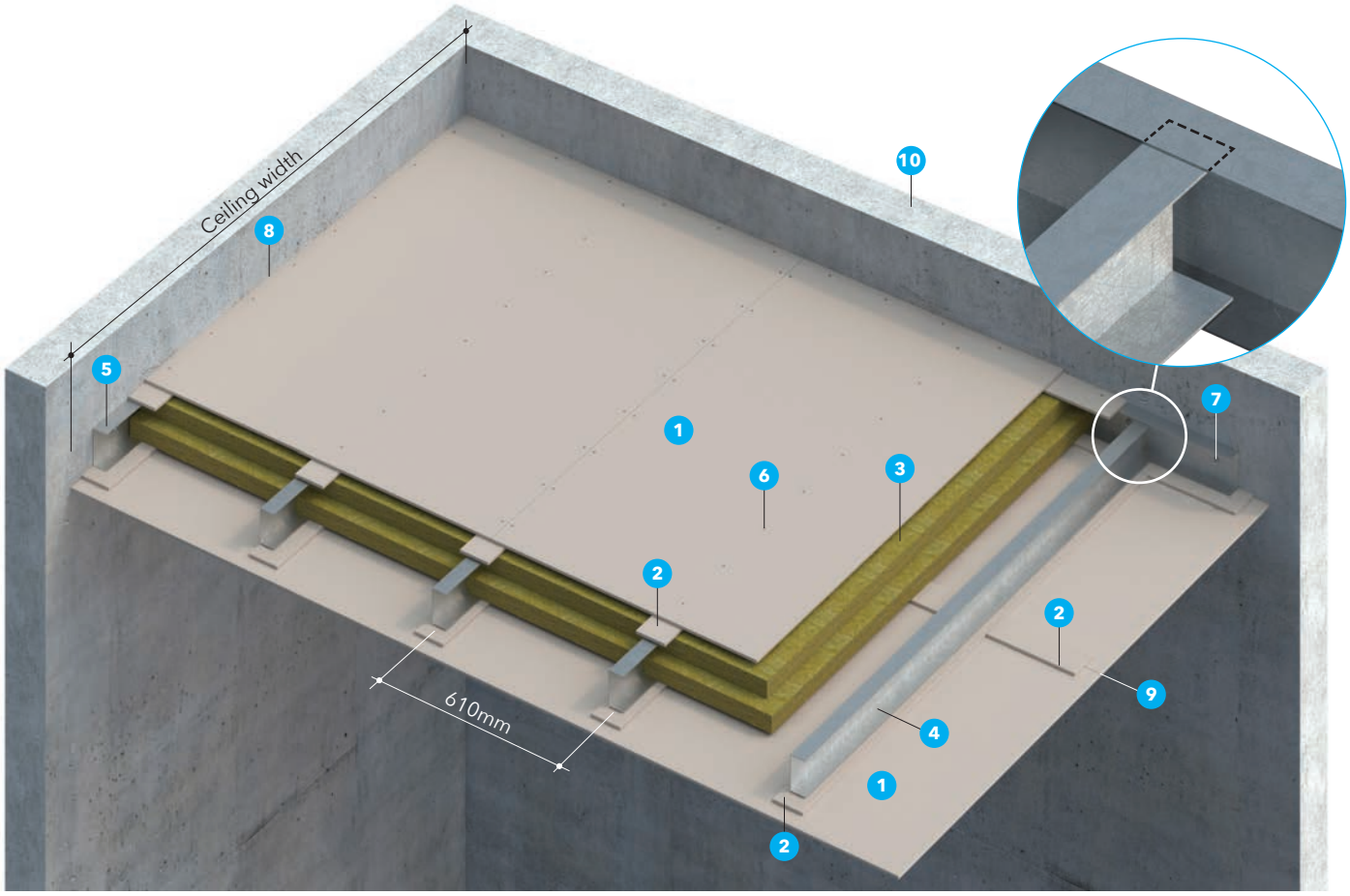
Note: Please consult Promat for ceiling's width larger than 3m.

Promat

PROMATECT®-H 2-hour fire rated self-supporting ceiling



Fire Resistance	FRL	-/120/120	Model number: PH.14.12.EN
	Standard	EN 1364: Part 2: 2018 (Non loadbearing)	
Acoustic	STC Rw	48 47dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	

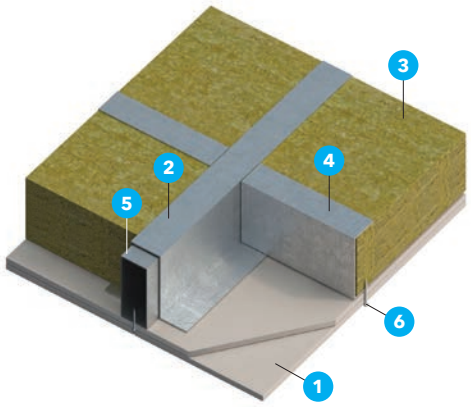


1. One layer of PROMATECT®-H 9mm thick.
2. PROMATECT®-H cover strips 100mm wide x 9mm thick.
3. Mineral wool 2 x 50mm x 100kg/m³ (staggered joints min. 300mm between layers):
4. Steel channel 125 x 50 x 1.5mm thick at 610mm centres.
5. Steel perimeter channel support 130 x 50 x 1.5mm thick.
6. No.8 self-tapping screw fixed at 200mm centres on facing board and at 500mm on cover strip to purlins.
7. M8 expansion bolts at 600mm centres.
8. PROMASEAL®-A Acrylic Sealant to seal gaps on irregularities surface.
9. Transverse board joint.
10. Masonry wall.

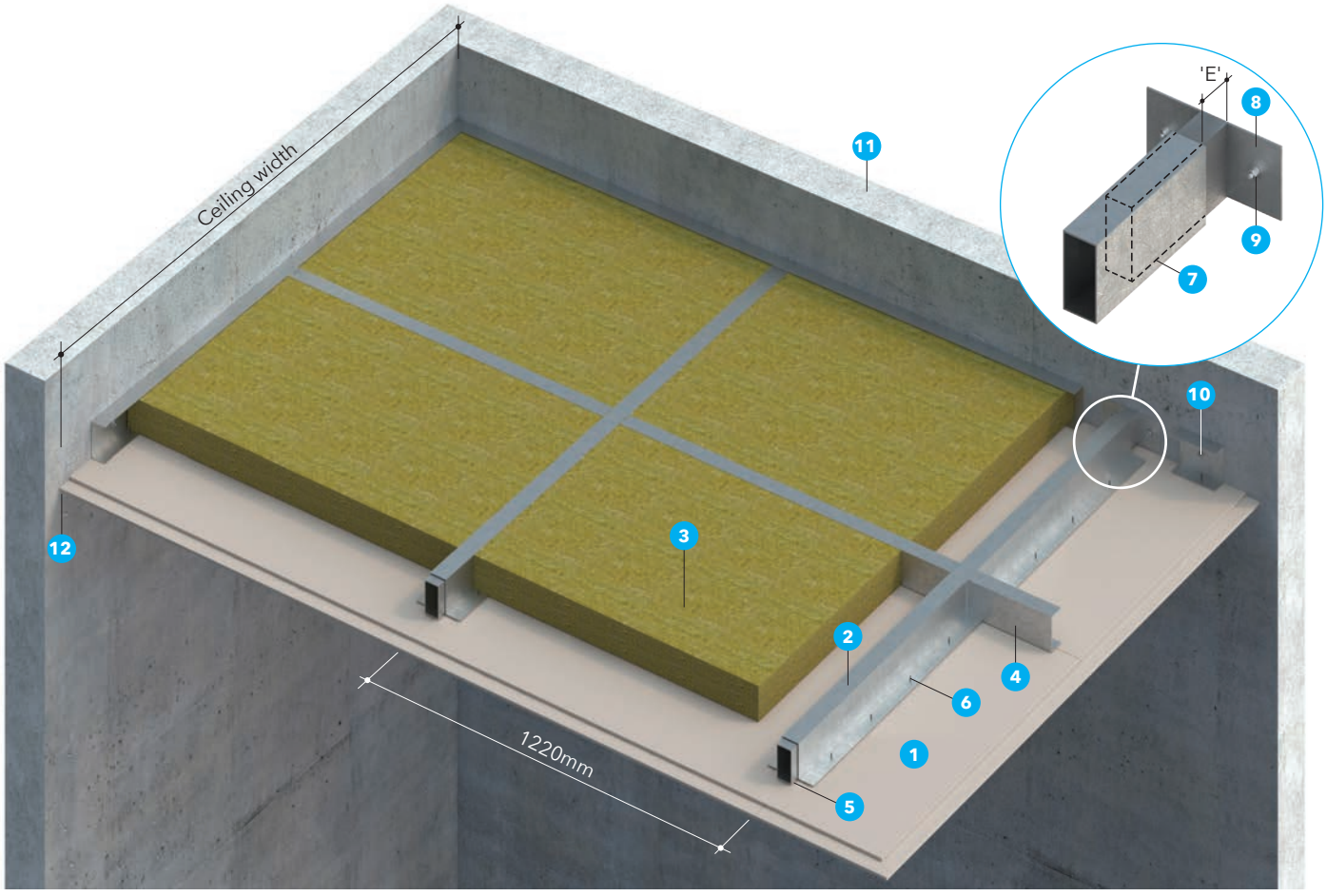
Note: Please consult Promat for ceiling's width larger than 3.4m.

Promat

PROMATECT®-H 2-hour fire rated self-supporting ceiling



Fire Resistance	FRL	-/120/120	Model number: PH.14.12-A
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	32 33dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



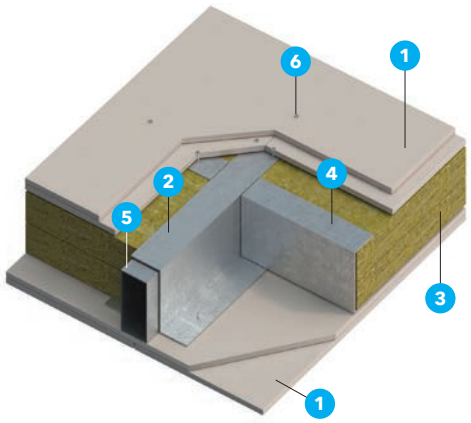
1. Two layers of PROMATECT®-H 9mm thick staggered joints min. 300mm between boards.
2. Steel top hat g.s 0.5mm thick.
3. Mineral wool 100mm x 80kg/m^3 or 80mm x 100kg/m^3 (staggered joints min. 300mm between layers):
4. Intermediate steel channel 0.6mm thick at 610mm centres.
5. Main support RHS 100 x 50 x 3mm at max. 1220mm centres for ceiling width up to 3m.
6. M4 self-tapping screws at 200mm centres.
7. RHS bracket fully welded to end plate (note 8).
8. Steel plate min 3.0mm thick.
9. M12 anchor bolts to fix note 8.
10. M6 anchor bolts at 600mm centres.
11. Masonry wall.
12. PROMASEAL®-A Acrylic Sealant to seal gaps on irregularities surface.

FRL (hour)	Expansion gap 'E'
2	10.7mm/m

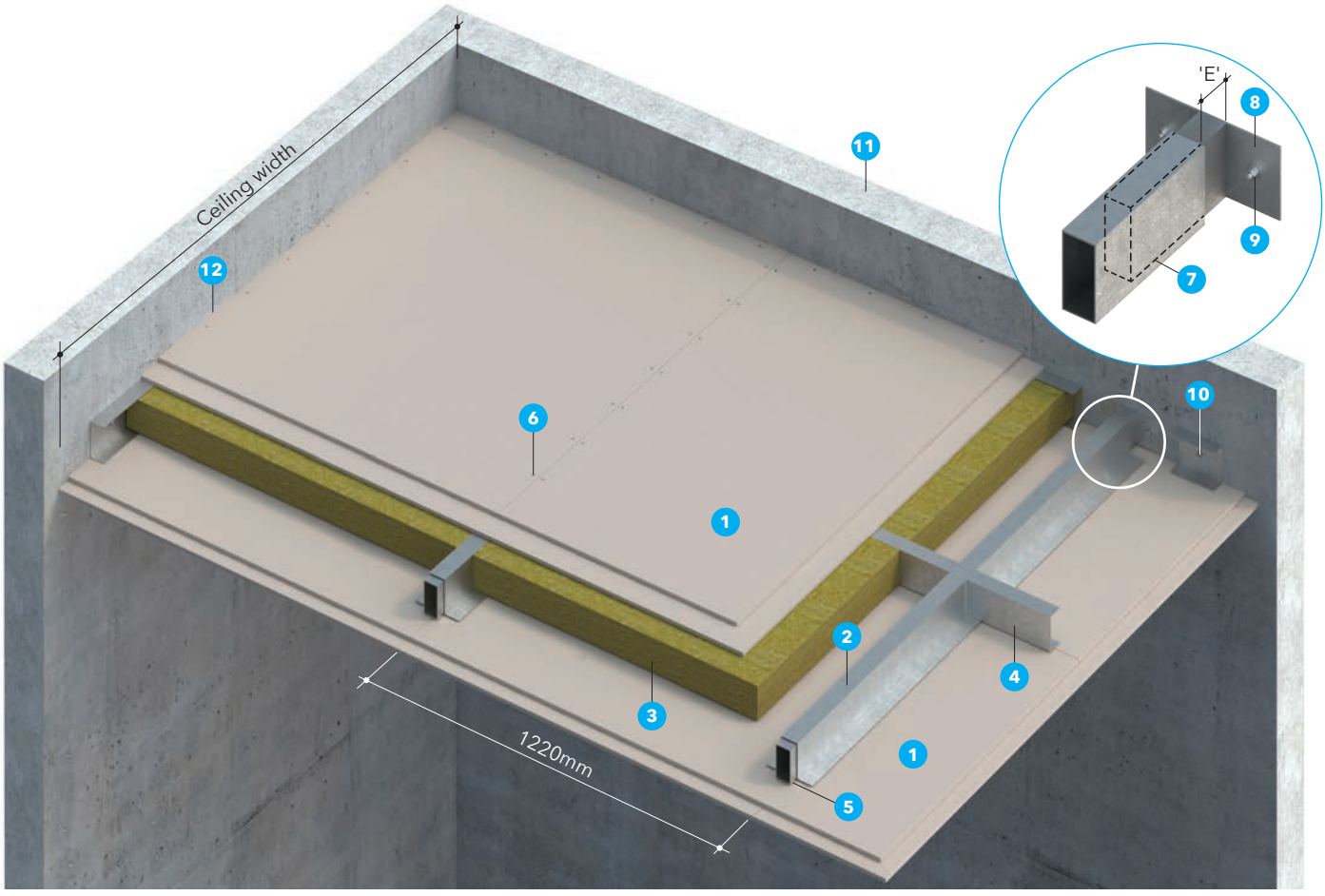
Note: Please consult Promat for ceiling's width larger than 3m.

Promat

PROMATECT®-H 4-hour fire rated self-supporting ceiling (Type 1)



Fire Resistance	FRL	-/240/240	Model number: PH.14.24
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	59 58dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



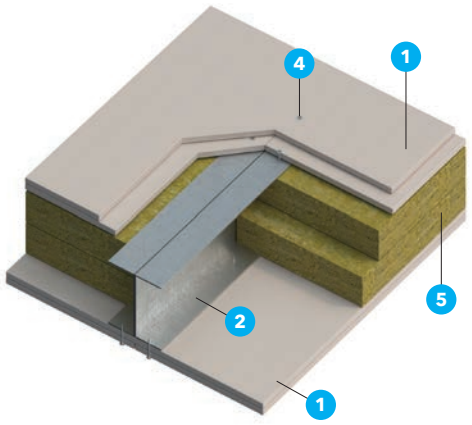
1. Two layers of PROMATECT®-H 12mm thick staggered joints min. 300mm between boards.
2. Galvanised steel top hat section 1.2mm thick.
3. Mineral wool 100mm x 100kg/m^3
4. Channel C 100 x 50 x 1.2mm thick at 610mm centres.
5. Main support RHS 100 x 50 x 3mm at max. 1220mm centres for ceiling width up to 3m.
6. Self-tapping screw M4 x 25mm at 300mm centres for inner board and M4 x 38mm at 200mm centres for outer board.
7. RHS bracket fully welded to end plate (note 8).
8. Steel plate min 4.0mm thick.
9. M12 anchor bolts to fix note 8.
10. M6 anchor bolts at 600mm centres.
11. Masonry wall.
12. PROMASEAL®-A Acrylic Sealant to seal gaps on irregularities surface.

FRL (hour)	Expansion gap 'E'
4	11.9mm/m

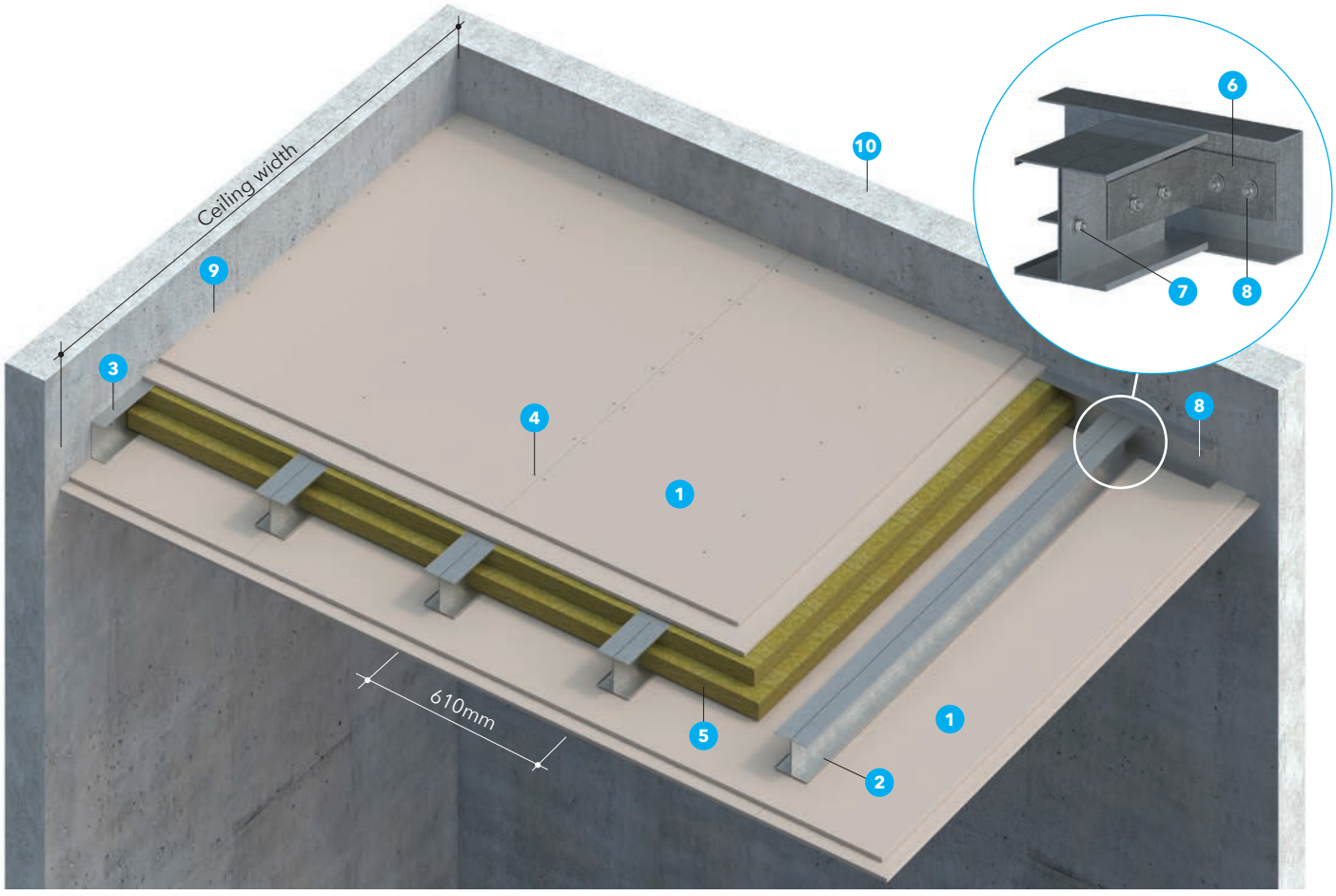
Note: Please consult Promat for ceiling's width larger than 3m.

Promat

PROMATECT®-H 4-hour fire rated self-supporting ceiling (Type 2)



Fire Resistance	FRL	-/240/240	Model number: PH.14.24
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	56 56dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	

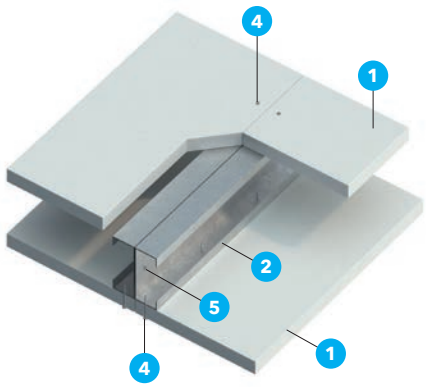


1. Two layers of PROMATECT®-H 12mm thick staggered joints min. 300mm between boards.
2. Back to back C-channels C-101 x 51 x 1.6mm at 610mm centres.
3. Perimeter galvanised steel channel 108 x 51 x 1.6mm thick.
4. M4 self-tapping screws at 200mm centres.
5. Mineral wool 2 x 50mm x 100kg/m^3
6. L-Angle bracket 150 x 100 x 50 x 5mm thick (on both sides)
7. M10 bolt and nut at 500mm centres for back to back channel supports.
8. M10 all steel anchor bolts at 600mm centres.
9. PROMASEAL®-A Acrylic Sealant to seal gaps on irregularities surface.
10. Masonry wall.

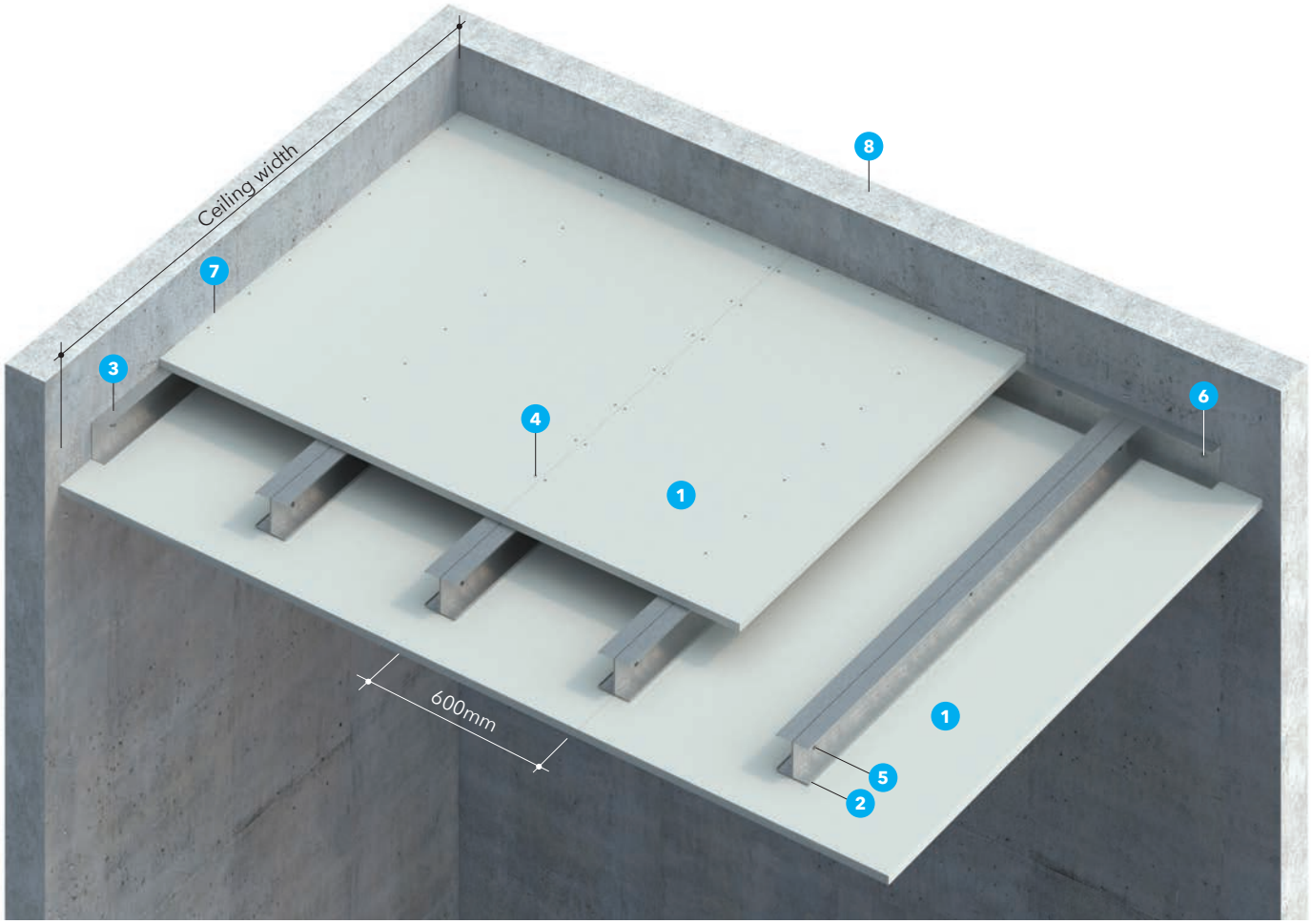
Note: Please consult Promat for ceiling's width larger than 3m.

Promat

PROMATECT®-L500 2-hour fire rated self-supporting ceiling



Fire Resistance	FRL	-/120/120	Model number: PE.14.12.EN
	Standard	EN 1364: Part 2 (Non loadbearing)	
Acoustic	STC Rw	32 38dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	

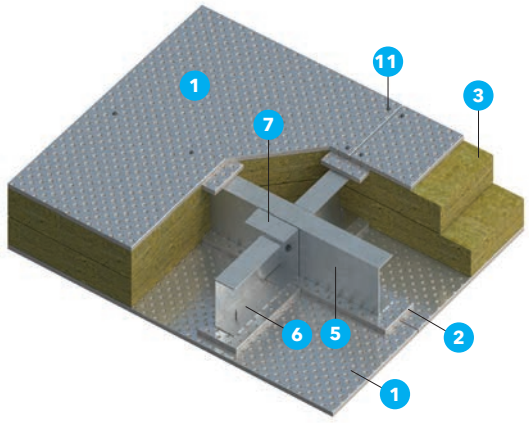


1. One layer of PROMATECT®-L500 25mm thick facing board.
2. Two back to back steel channels C-100 x 50 x 1mm form into I-section at 600mm intervals.
3. Perimeter steel channel U-100 x 50 x 1mm thick.
4. M4 self-tapping screws at 200mm centres.
5. M4 x 25 self-tapping screws for fixing the steel channels at 800mm centre.
6. M10 all steel anchor bolts at 500mm centres.
7. PROMASEAL®-A Acrylic Sealant to seal gaps on irregularities surface.
8. Masonry wall.

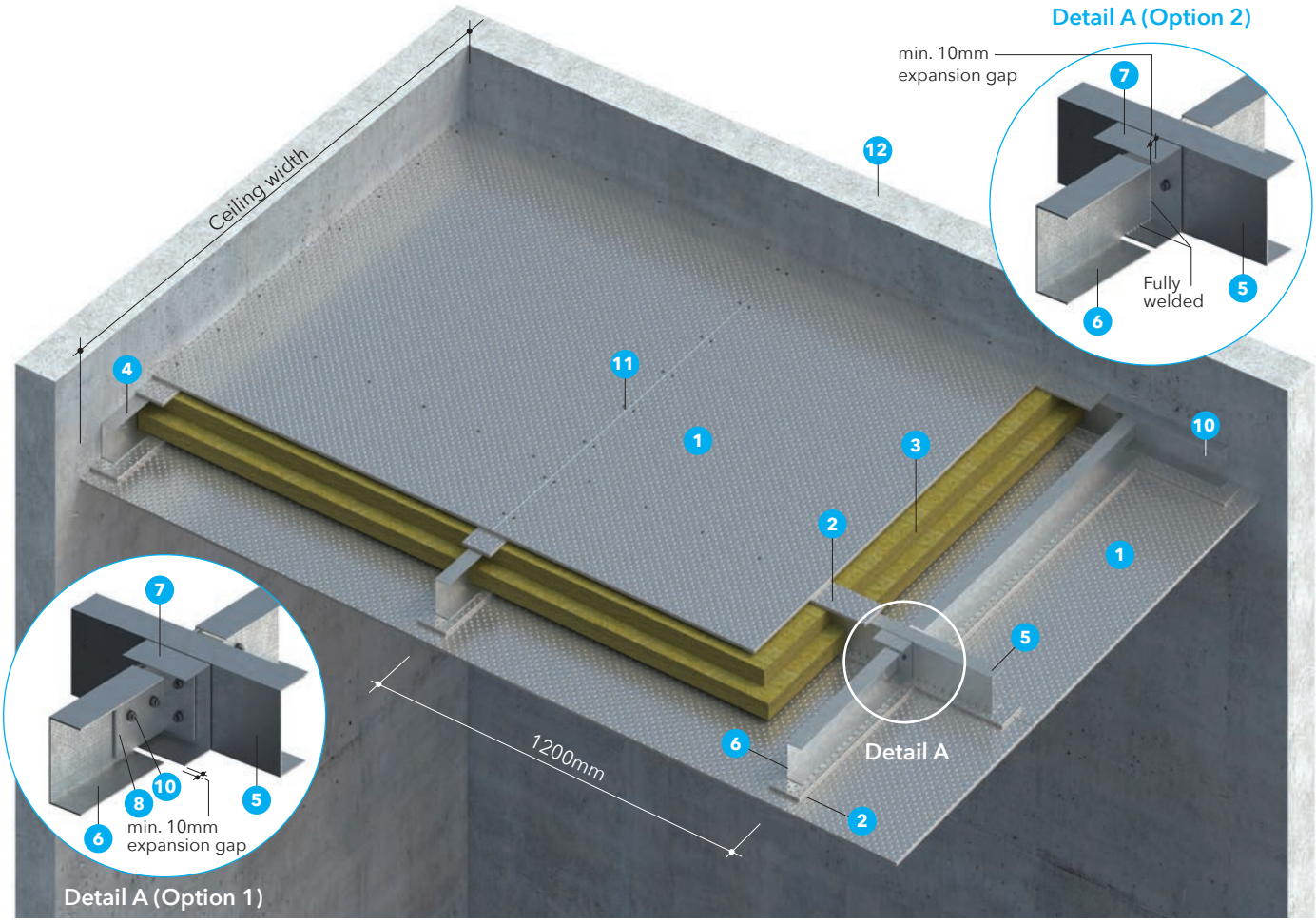
Note: Please consult Promat for ceiling's width larger than 3m.

Promat

PROMATECT®-S 2-hour fire rated self-supporting ceiling



Fire Resistance	FRL	-/120/120	Model number: PS.14.12
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	63 62dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	

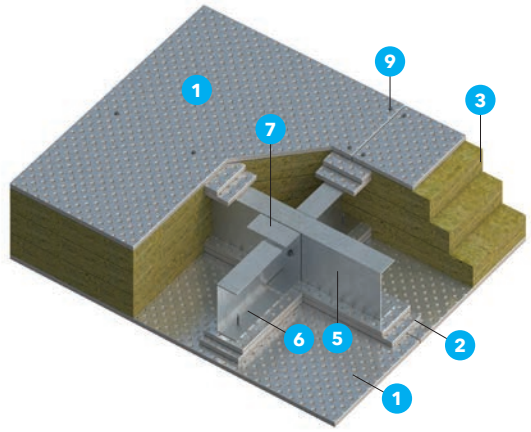


1. One layer of PROMATECT®-S 9.5mm thick.
2. PROMATECT®-S cover strips 100 x 9.5mm to coincide with all steel channels.
3. Mineral wool 75mm x 100kg/m^3 or 2 x 40mm x 140kg/m^3.
4. C-100 x 50 x 3mm thick perimeter channels.
5. Main support, C-100 x 50 x 3mm thick or 80 x 60 x 3mm at 1200mm intervals.
6. Intermediate support, C-100 x 50 x 3mm thick at 1200mm intervals.
7. C-channel bracket (min. 3mm thick) welded or bolted to main channel.
8. Steel L-bracket minimum 5mm thick.
9. M10 expansion-bolt at 500mm centres.
10. M10 expansion-bolt
11. Teks Screws at 200mm centres.
12. Masonry wall.

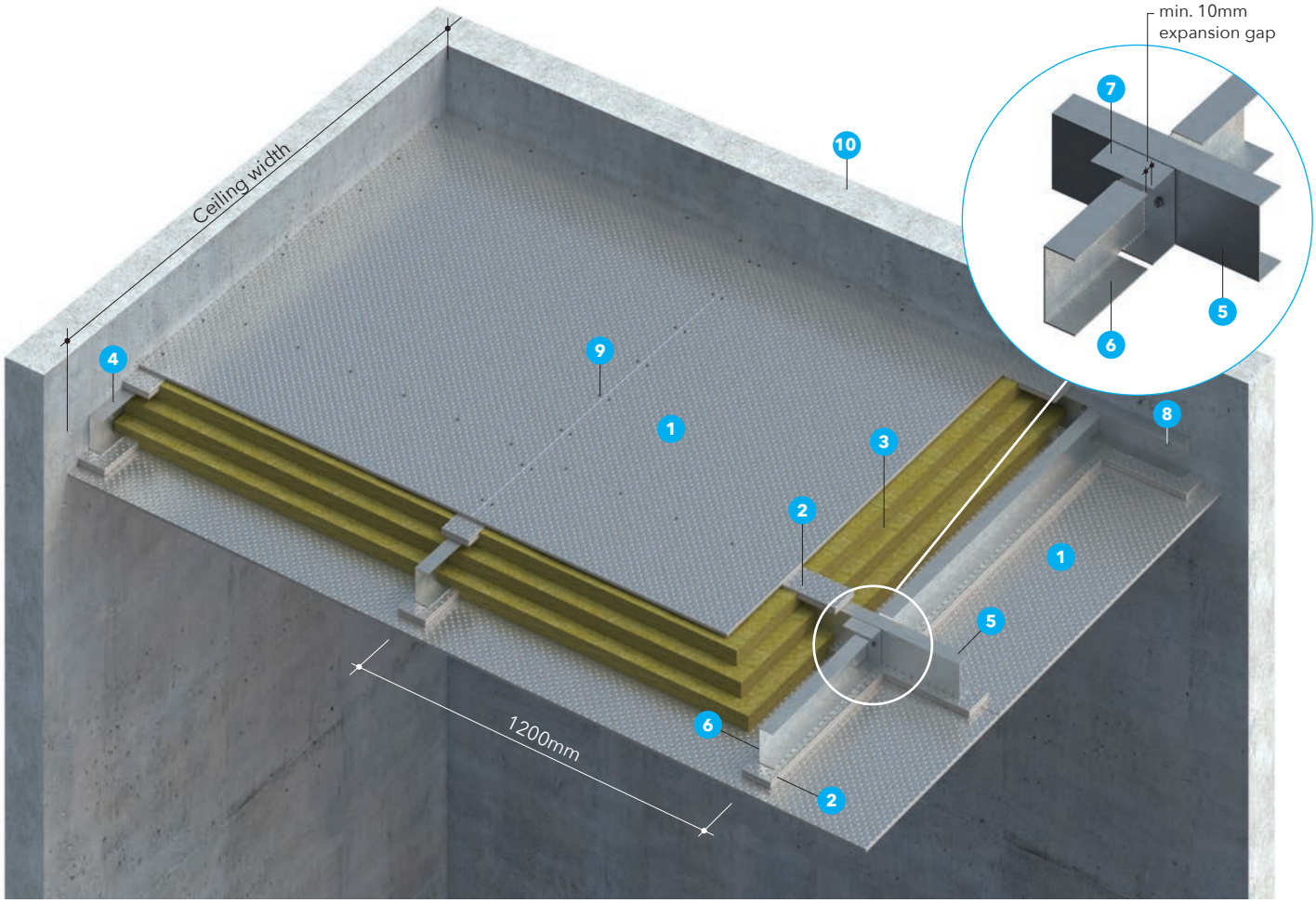
Note: Please consult Promat for ceiling's width larger than 3m.

Promat

PROMATECT®-S 4-hour fire rated self-supporting ceiling



Fire Resistance	FRL	-/240/240	Model number: PS.14.24
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	64 63dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	

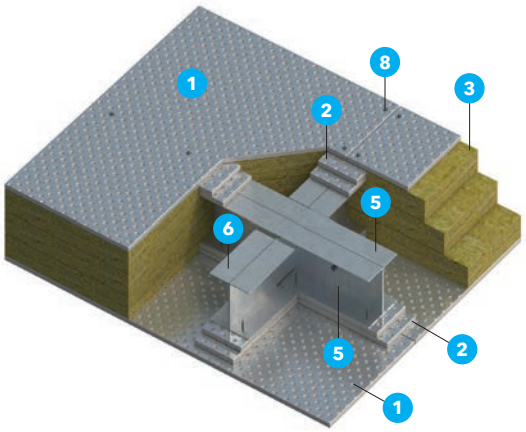


1. One layer of PROMATECT®-S 9.5mm thick.
2. PROMATECT®-S cover strips 2 x 100 x 9.5mm to coincide with all steel channels.
3. Mineral wool 3 x 40mm x 140kg/m^3
4. C-100 x 50 x 3mm thick perimeter channels.
5. Main support, C-80 x 60 x 3mm thick at 1200mm intervals.
6. Intermediate support, C-80 x 60 x 3mm thick at 1200mm intervals.
7. C-channel bracket (min. 3mm thick) welded or bolted to main channel.
8. M10 expansion-bolt at 500mm centres.
9. Teks Screws at 200mm centres.
10. Masonry wall.

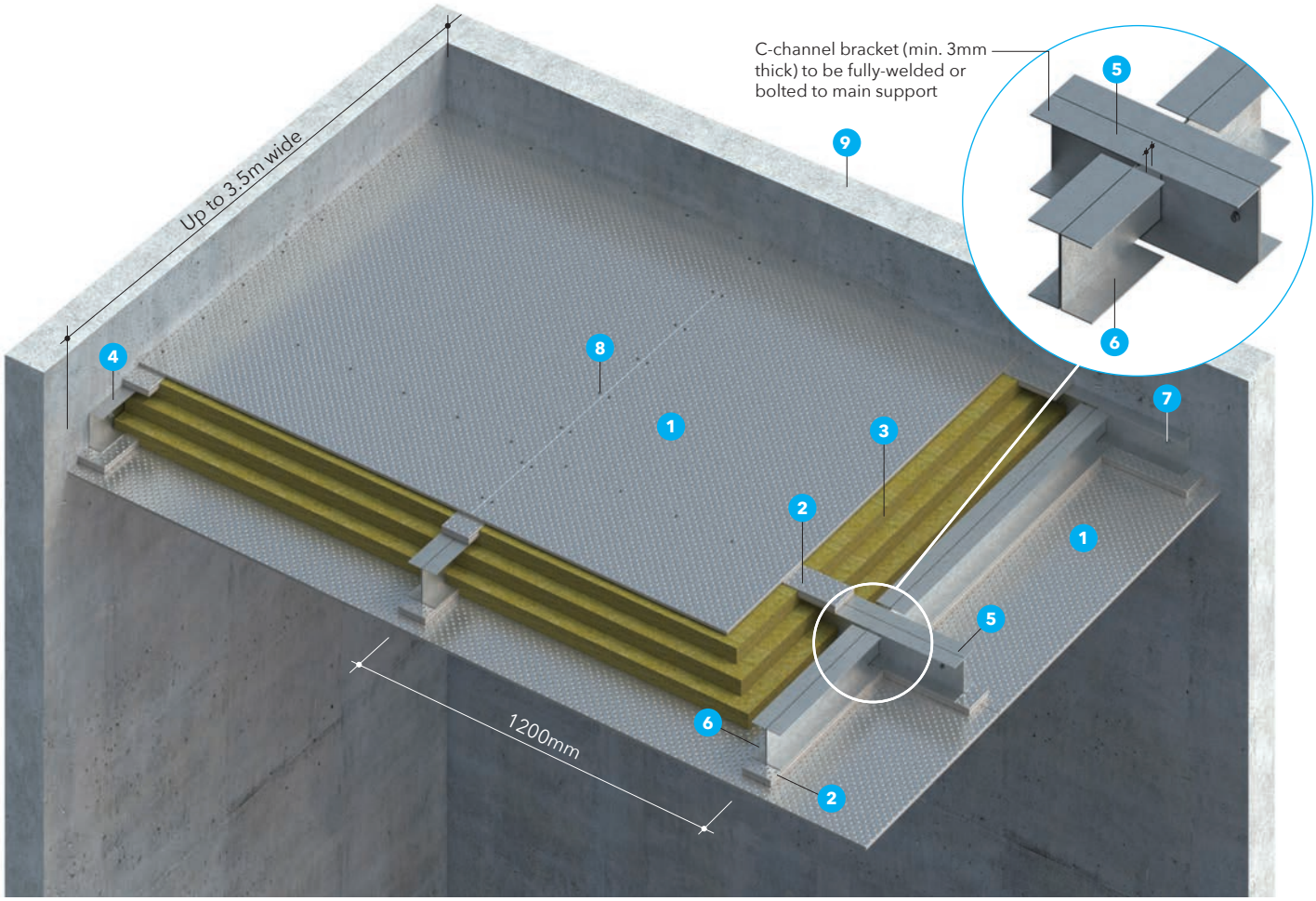
Note: Please consult Promat for ceiling's width larger than 3m.

Promat

PROMATECT®-S 2-hour fire rated self-supporting ceiling (Hydrocarbon)



Fire Resistance	**FRL**	-/120/120	Model number: PS.14.12-HC
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	**STC** **Rw**	64 63dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	

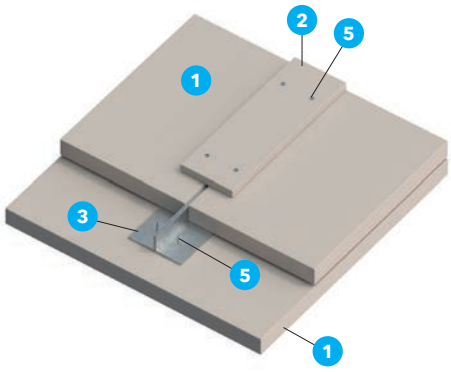


1. One layer of PROMATECT®-S 9.5mm thick.
2. PROMATECT®-S cover strips 2 x 100 x 9.5mm to coincide with all steel channels.
3. Mineral wool 3 x 50mm x 140kg/m^3
4. C-100 x 50 x 3mm thick perimeter channels (min. size).
5. Main support, back to back C-100 x 50 x 3mm thick at 1200mm intervals (min. size).
6. Intermediate support, back to back C-100 x 50 x 3mm at 1200mm intervals (min size).
7. M10 x 60mm expansion-bolt at 500mm centres.
8. Ejot HS55 Teks Screws at 200mm centres.
9. Masonry wall.

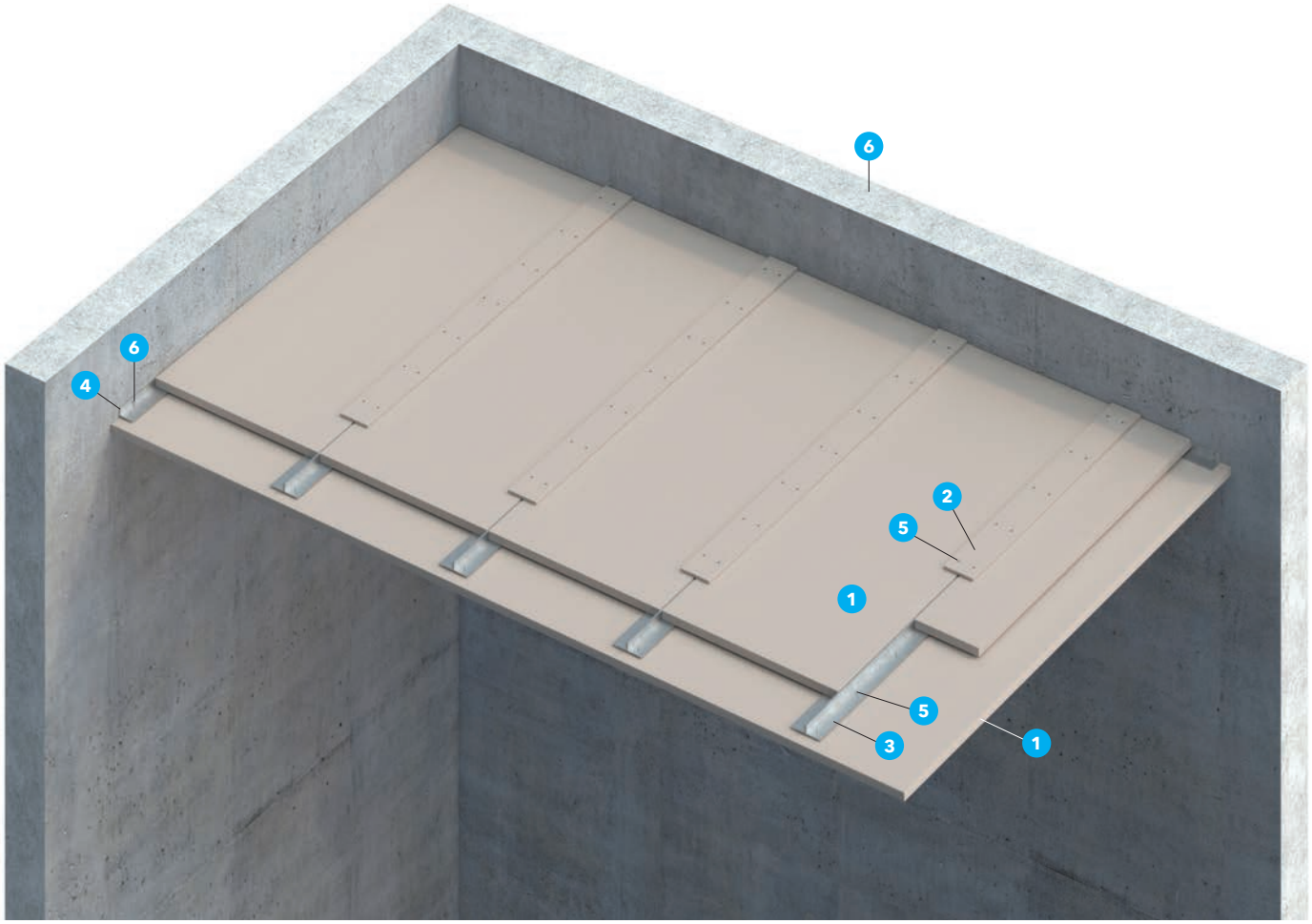
Note: Please consult Promat for ceiling's width larger than 3m.

Promat

PROMATECT®-H 2-hour fire rated solid ceiling



Fire Resistance	FRL	-/120/120	Model number: PH.15.12-A
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	35 37dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	

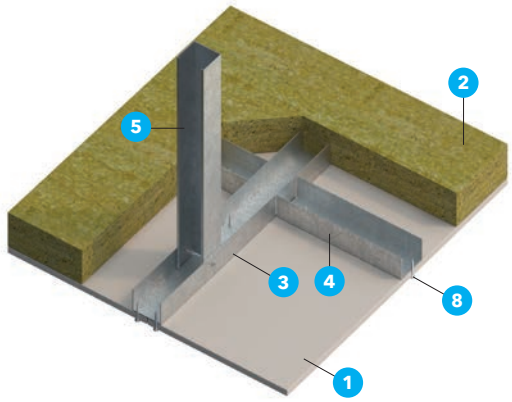


1. Two layers of PROMATECT®-H 25mm thick.
2. PROMATECT®-H cover stips 9mm thick x 100mm wide.
3. Intermediate back-to-back steel angle L-25 x 50 x 3mm thick at 610mm centre.
4. Perimeter steel angle L-25 x 50 x 3mm thick.
5. M4 self tapping screw fixed at 200mm centres.
6. M10 steel anchor bolt at 500mm centre.
7. Masonry wall.

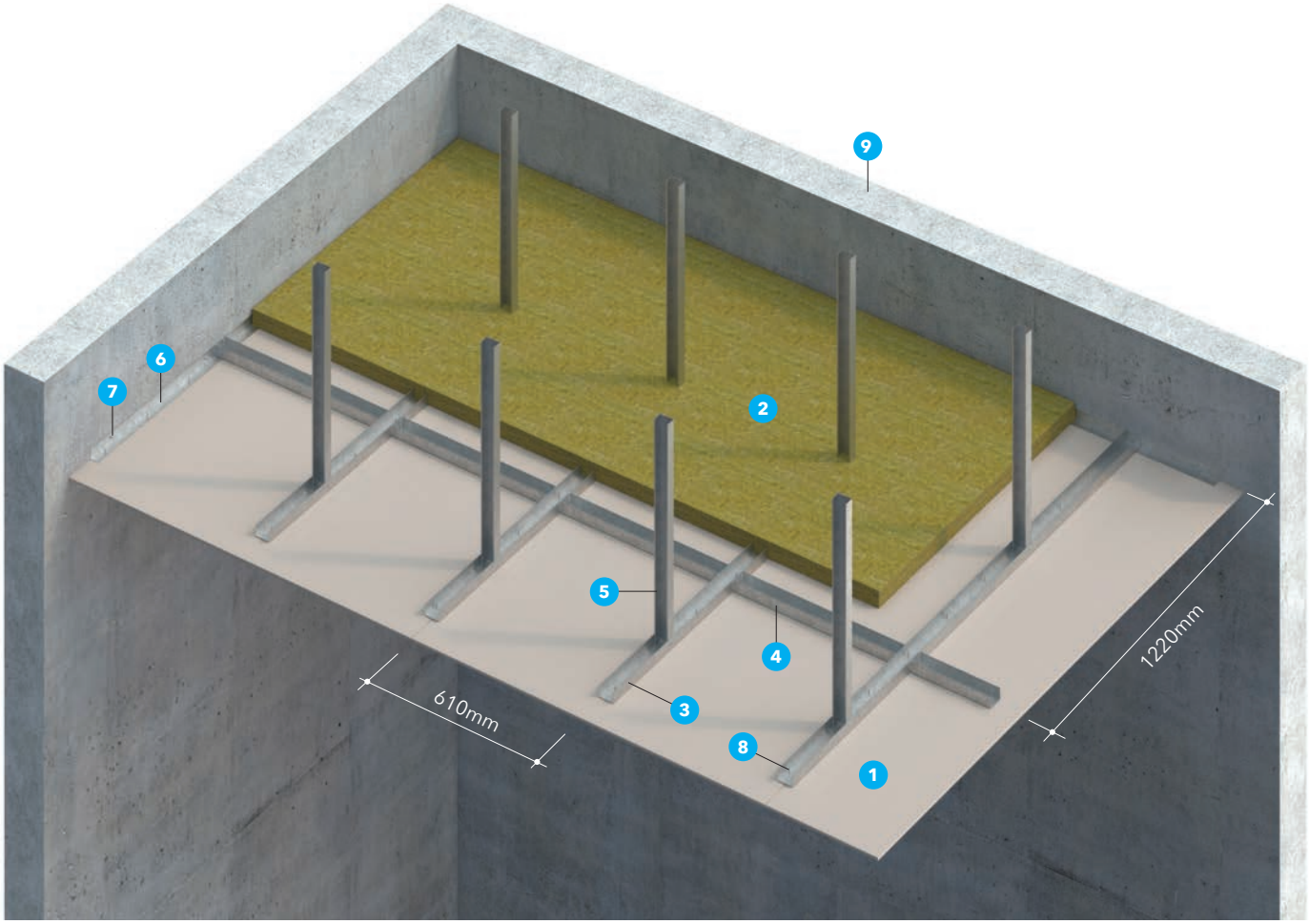
Notes: Steel support illustrated is up to 2m span. Please consult Promat for larger ceiling span.

Promat

PROMATECT®-H 1-hour fire rated suspended ceiling



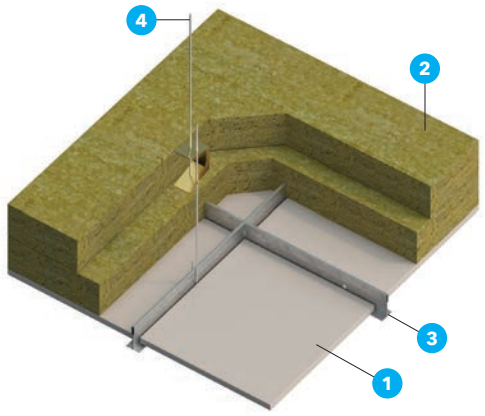
Fire Resistance	FRL	-/60/60	Model number: PH.14.60-S
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	26 27dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



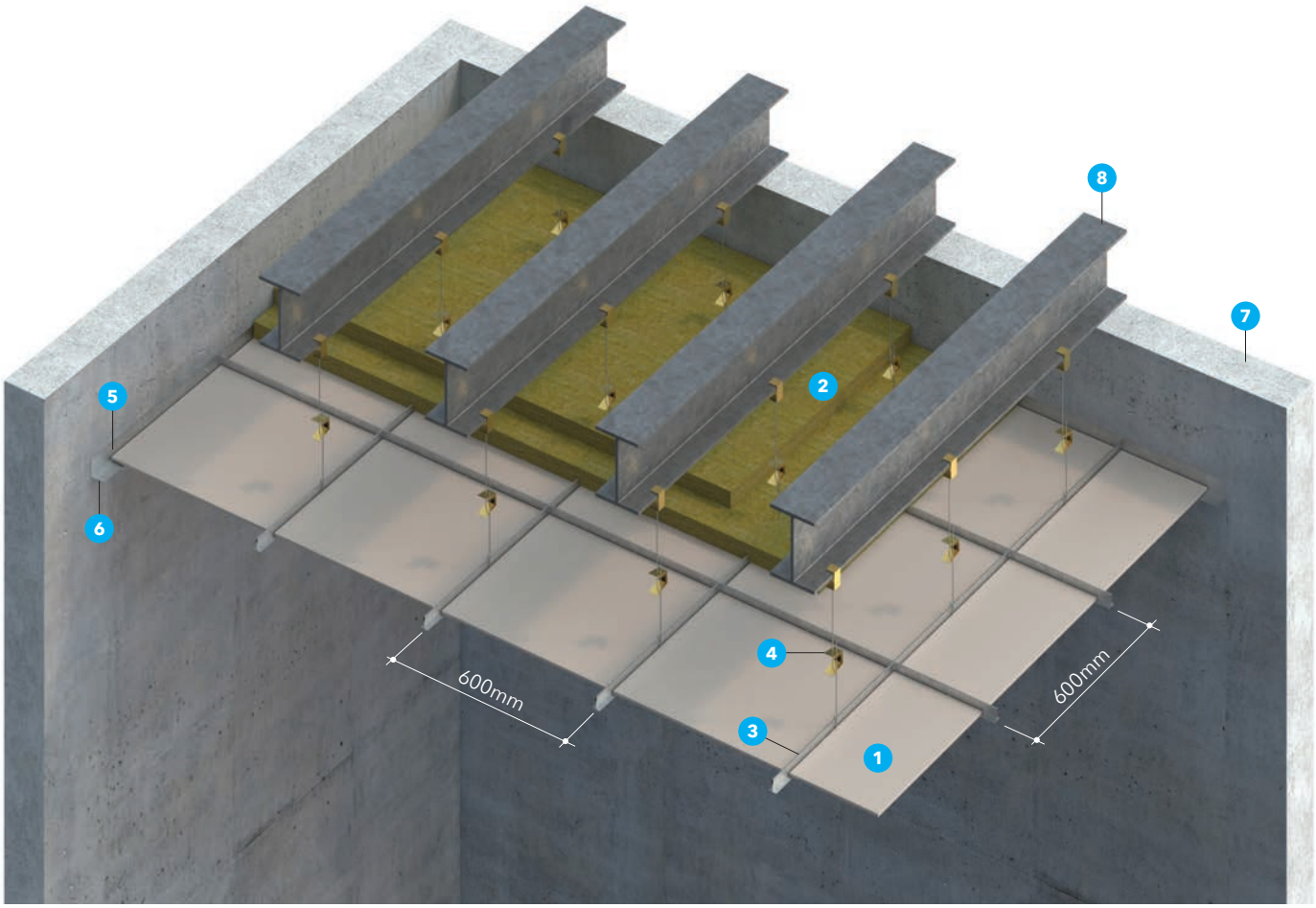
1. One layer of PROMATECT®-H 12mm thick.
2. Mineral wool, 50mm x 60kg/m^3.
3. Main support C-channel 50 x 31 x 0.6mm at 610mm intervals & at all board joints.
4. Cross support C-channel 50 x 31 x 0.6mm at 1220mm intervals & at all board joints.
5. Steel suspended members at 1220mm intervals. Stress shall not exceed 3.3N/mm.
6. Perimeter angle L30 x 30 x 0.6mm.
7. M6 steel anchor bolts at 500mm centres.
8. M4 self-tapping screws at 200mm centres.
9. Masonry wall.

Promat

PROMATECT®-H 1.5-hour fire rated suspended ceiling



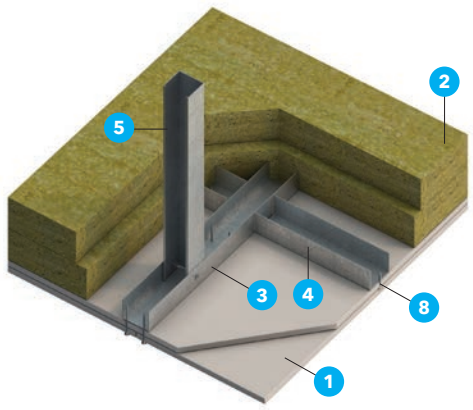
Fire Resistance	**FRL**	-/90/90	Model number: PH.14.90-T.EN
	Standard	EN 1364: Part 2 (Non loadbearing)	
Acoustic	**STC** **Rw**	26 27dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



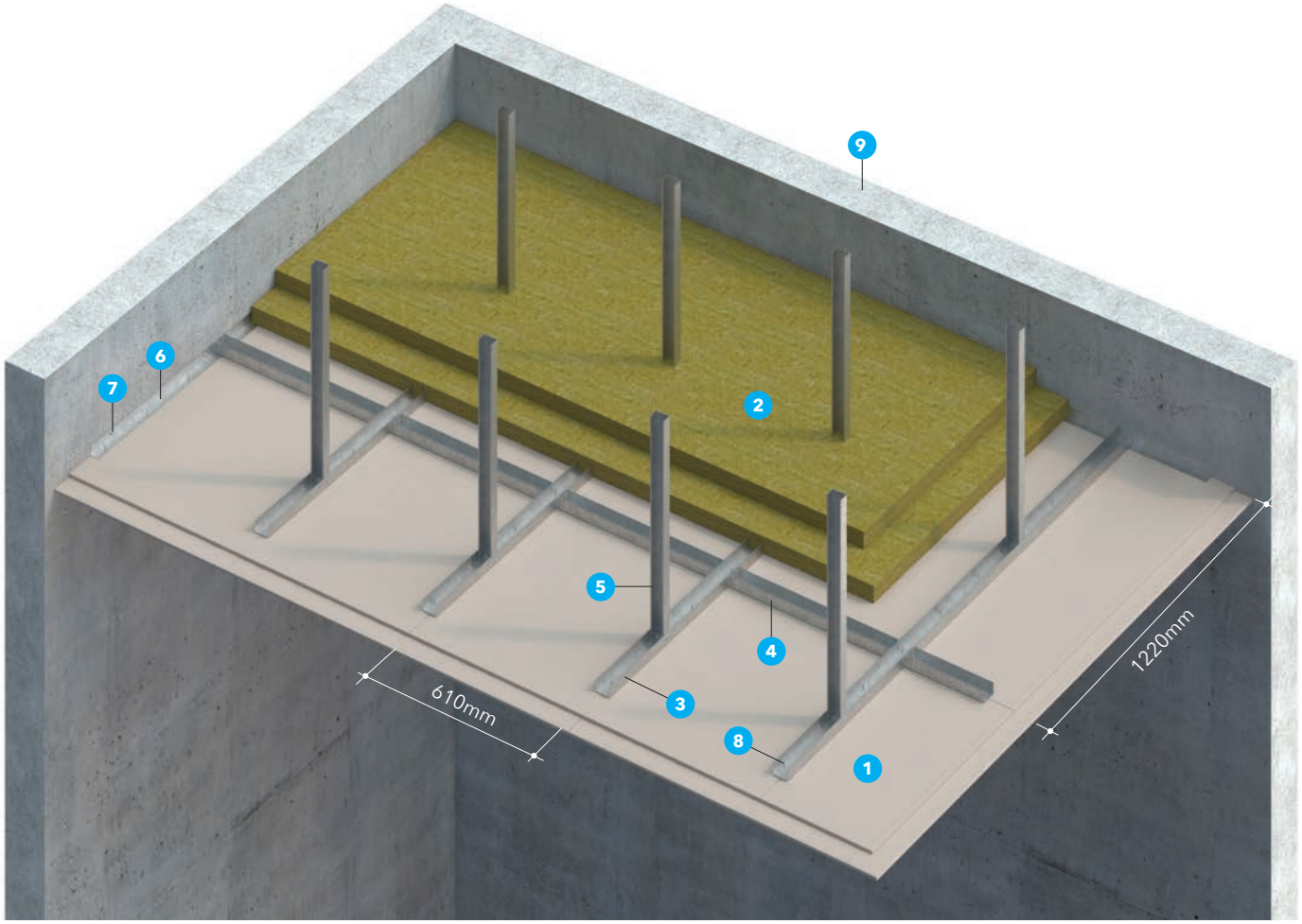
1. One layer of PROMATECT®-H 595 x 595 x 9mm thick.
2. Mineral wool 2 x 50mm x 100kg/m^3.
3. Galvanised steel ceiling runner T-38 x 24 x 0.5mm in grid of 610 x 610mm.
4. Steel hanger.
5. M6 anchor-bolts at 500mm centres.
6. Perimeter angle 50 x 50 x 0.6mm thick.
7. Masonry wall.
8. Unprotected steel beam.

Promat

PROMATECT®-H 2-hour fire rated suspended ceiling



Fire Resistance	FRL	-/120/120	Model number: PH.14.12-S
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	32 33dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



1. Two layers of PROMATECT®-H 9mm thick staggered joints min. 300mm apart between boards.
2. Mineral wool, 2 x 50mm x 100kg/m^3 staggered joints min. 300mm apart between mineral wool.
3. Main support C-channel 50 x 31 x 0.6mm at 610mm intervals & at all board joints.
4. Cross support C-channel 50 x 31 x 0.6mm at 1220mm intervals & at all board joints.
5. Steel suspended members at 1220mm intervals. Stress shall not exceed 3.3N/mm.
6. Perimeter angle L30 x 30 x 0.6mm.
7. M6 steel anchor bolts at 500mm centres.
8. M4 self-tapping screws at 200mm centres.
9. Masonry wall.

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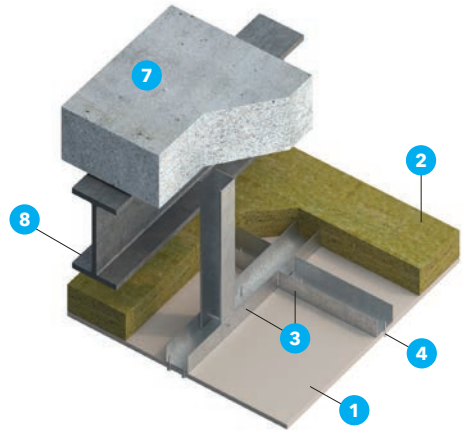
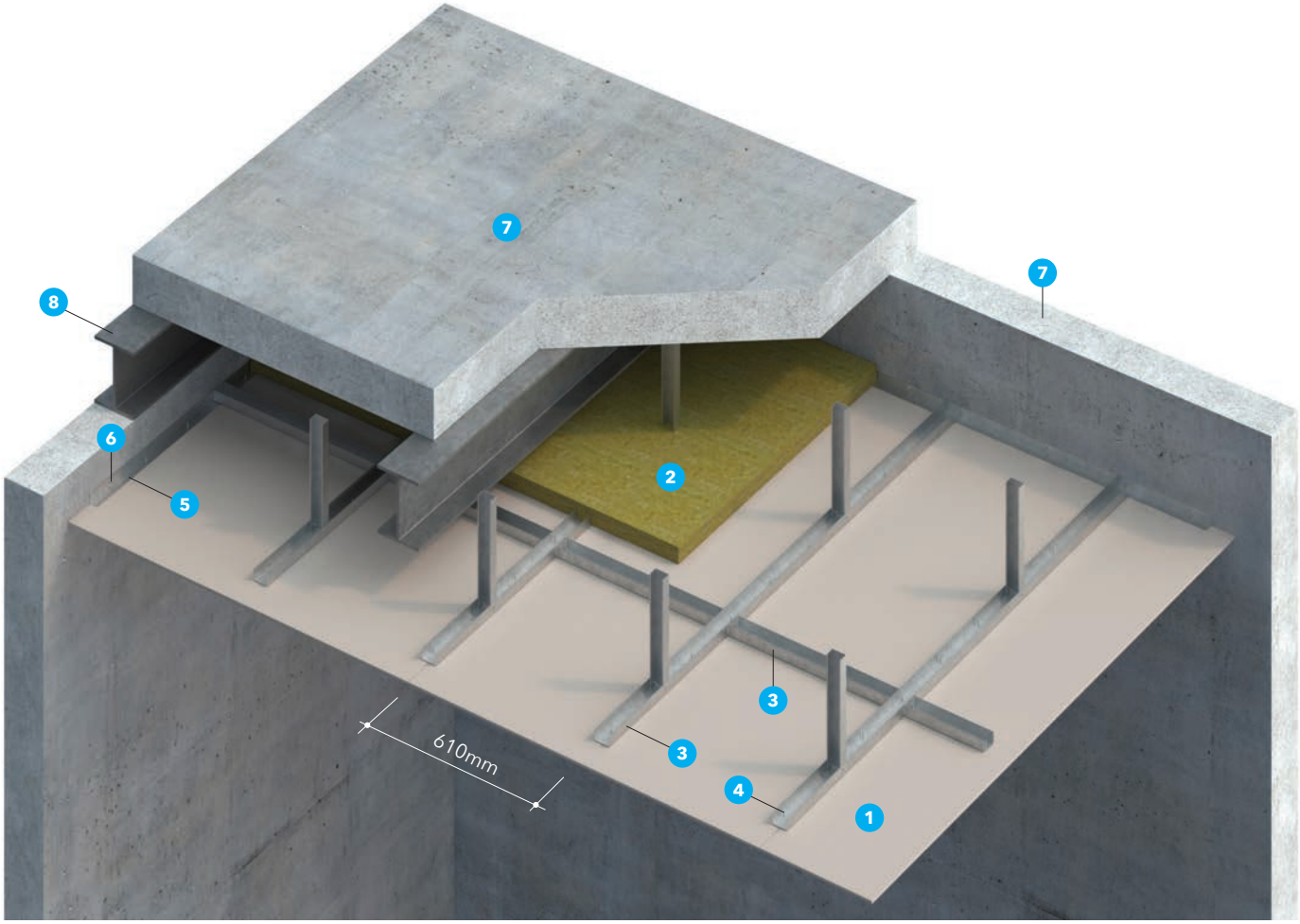
PROMATECT®-H 2-hour fire rated ceiling protection steel beam underneath floor slab



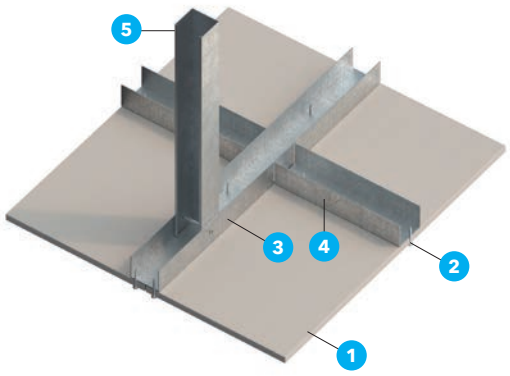
Fire Resistance	**FRL**	-/120/120	Model number: PH.12.12-S
	Standard	BS 476: Part 23: 1987 (Non loadbearing)	
Acoustic	**STC** **Rw**	27 28dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



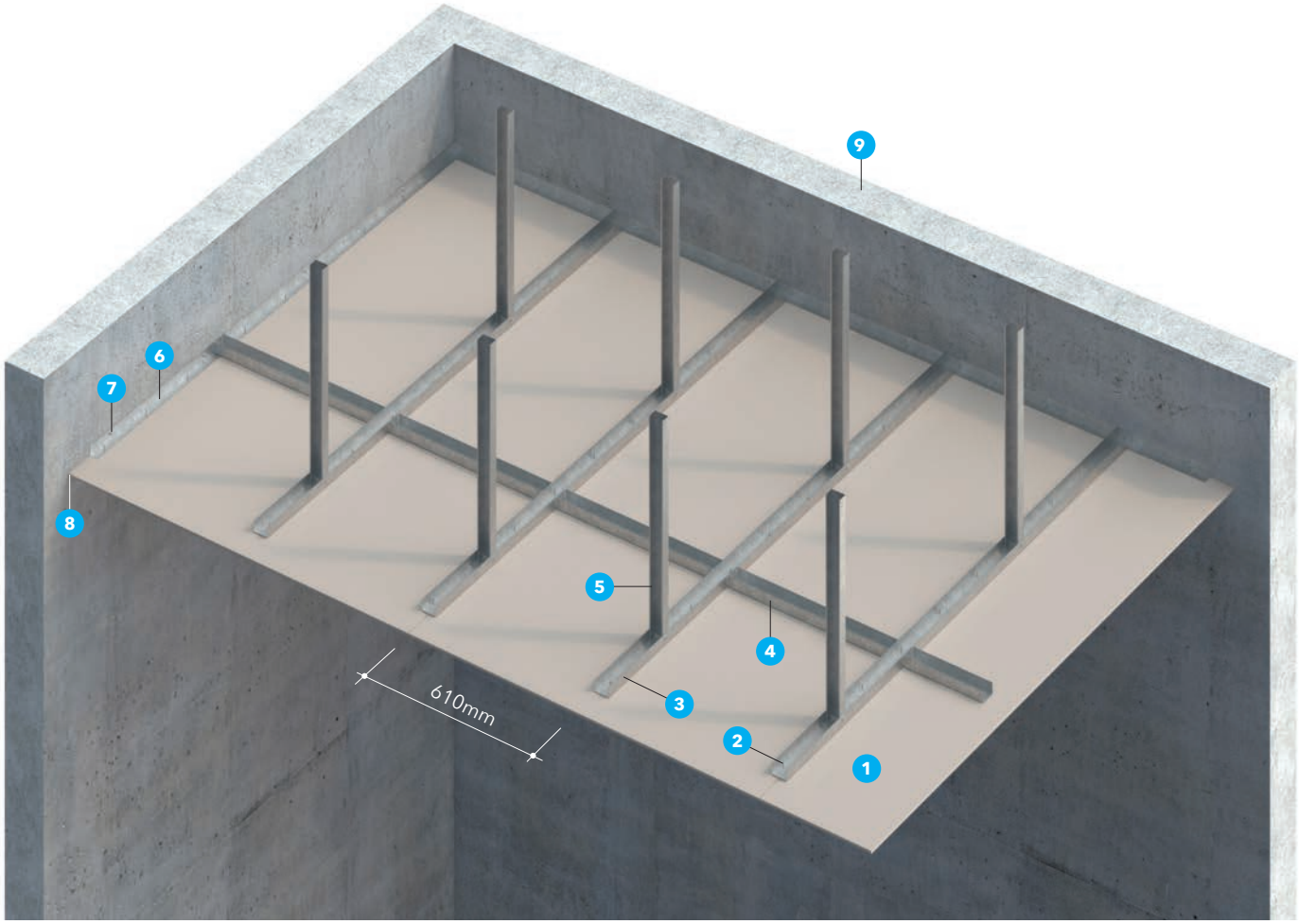
1. One layer of PROMATECT®-H 12mm thick.
2. Mineral wool 50mm x 45kg/m^3.
3. Main support C-channel 50 x 30 x 0.6mm at 610mm x 1220mm.
4. M4 self-tapping screws at 200mm centres.
5. M6 steel anchor bolts at 500mm centres.
6. Perimeter angle L50 x 50 x 0.6mm.
7. Concrete wall and slab.
8. Unprotected steel beam.

Promat

PROMATECT®-H 4-hour fire rated suspended ceiling (Integrity only)



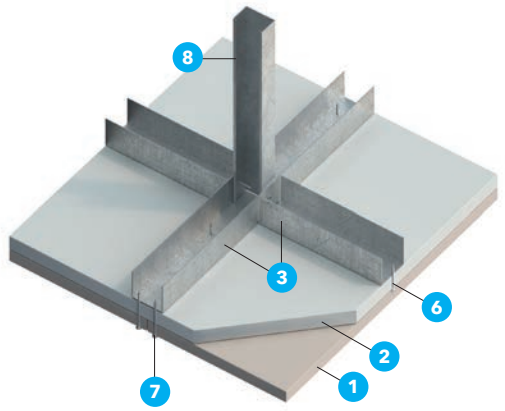
Fire Resistance	FRL	-/240/-	Model number: PH.14.24.E-S
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	26 27dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



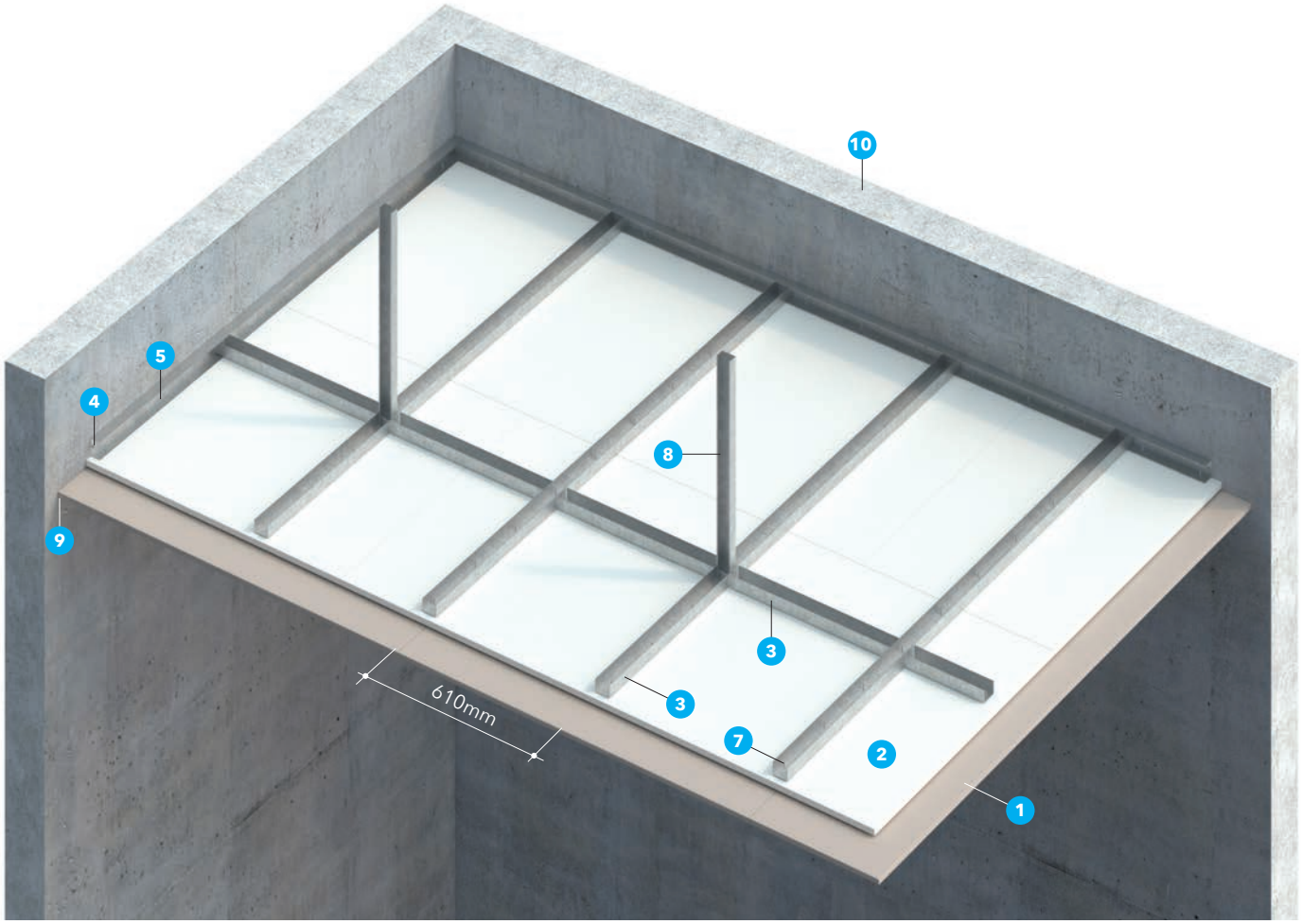
1. One layer of PROMATECT®-H 9mm thick.
2. M4 self-tapping screws at 200mm centres.
3. Main support C-channel 50 x 31 x 0.6mm at 610mm intervals & at all board joints (Other size permitted if $Z_x \geq 305mm^3$).
4. Cross support C-channel 50x31x0.6mm at 1220mm intervals & at all board joints (Other size permitted if $Z_x \geq 305mm^3$).
5. Steel suspended members at 1220mm intervals. Stress shall not exceed $3.3N/mm^2$.
6. Perimeter angle L50 x 40 x 0.6mm.
7. M6 steel anchor bolts at 500mm centres.
8. PROMASEAL®-A Acrylic Sealant to seal gaps on irregularities surface.
9. Masonry wall.

Promat

PROMATECT®-H & Promat SLIM&LIGHT 3 & 4-hour fire rated suspended ceiling



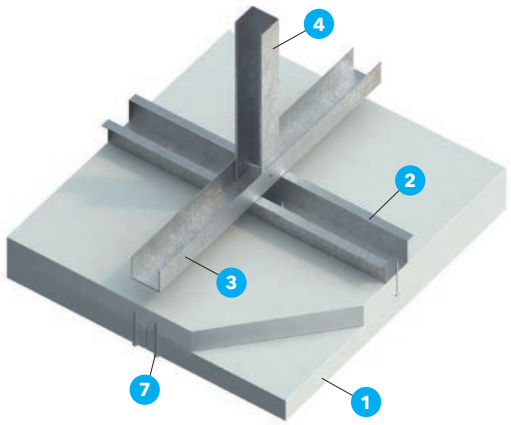
Fire Resistance	FRL	-/180/180 -/240/240	Model number: PH+P-SL.14S.18.EN Model number: PH+P-SL.14S.24.EN
	Standard	EN 1364: Part 2 (Non loadbearing)	
Acoustic	STC Rw	29 30dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



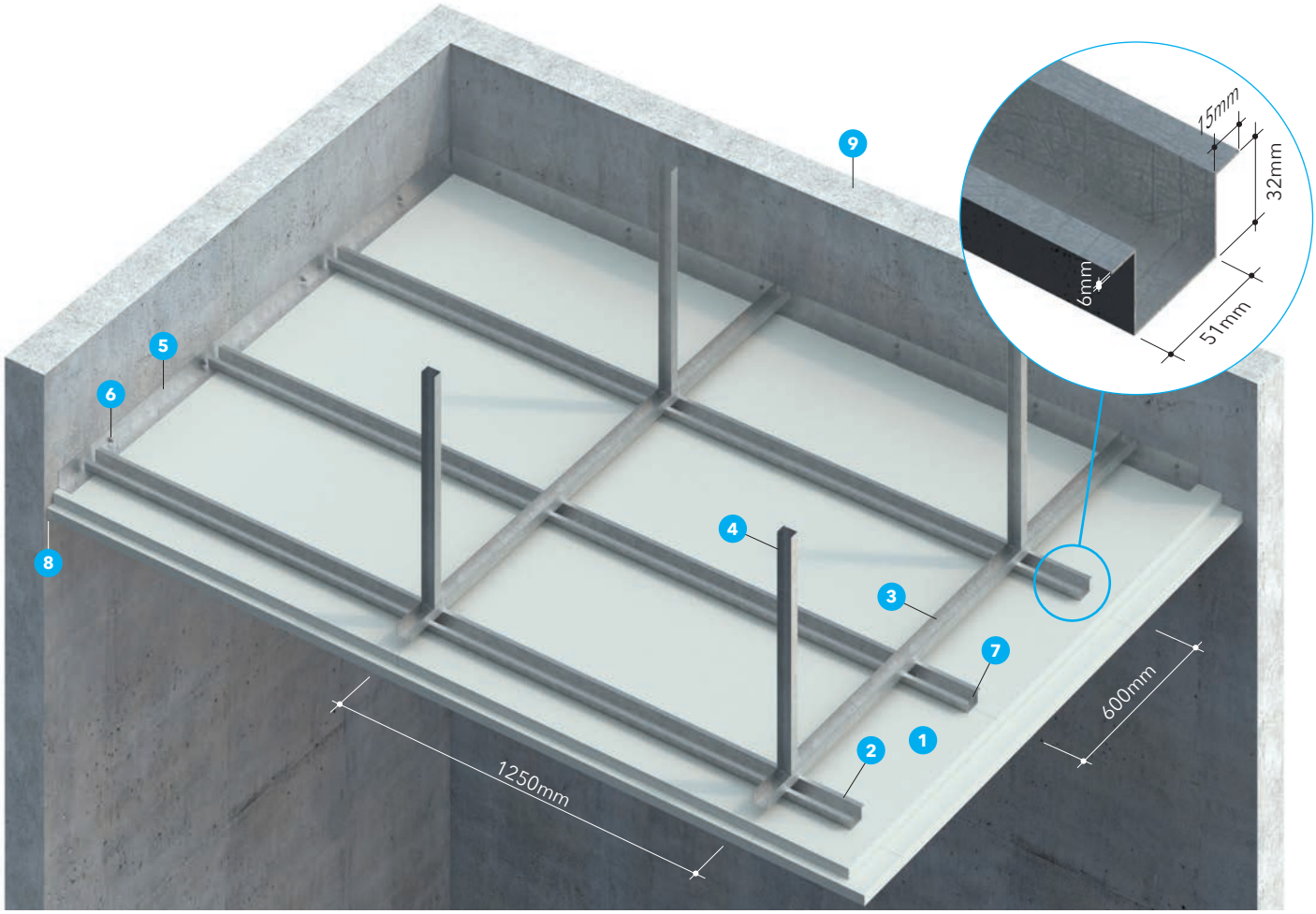
1. One layer of PROMATECT®-H 15mm thick.
2. Promat SLIM&LIGHT panels
   3-hour: 15mm thick
   4-hour: 18mm thick
3. Steel channel framework 51 x 36 x 0.55mm thick in 1220 x 610mm grid.
4. Perimeter steel channel 51 x 36 x 0.55mm thick.
5. M10 steel anchor bolts at 500m centres.
6. M6 x 25mm drywall screws with 15mm diameter steel washers at 610mm centres to fix inner board.
7. M8 x 50mm drywalls screws at 200mm centres to fix outer board.
8. Suspended steel channel 51 x 36 x 0.55mm thick at 1220mm centres
9. PROMASEAL®-A Acrylic Sealant to seal gaps on irregularities surface.
10. Masonry wall.

Promat

PROMATECT®-L500 4-hour fire rated suspended ceiling



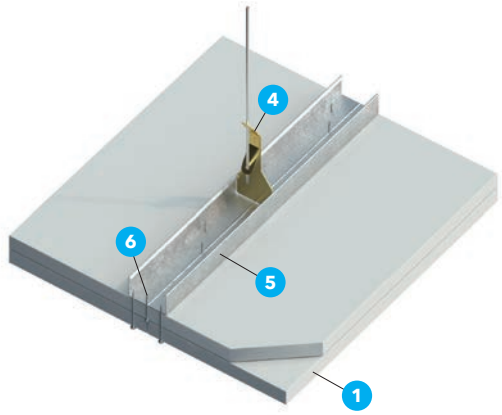
Fire Resistance	FRL	-/240/240	Model number: PE.14.24-S
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	32 33dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



1. Two layers of PROMATECT®-L500 30mm thick installed in staggered joints minimum 300mm between boards.
2. Main support using galvanised steel top hat section 0.6mm thick installed at 600mm interval (refer details), and fixed to cross support channel with M4 self-tapping screws.
3. Cross support channel U 51 x 32 x 0.6mm thick at 1250mm intervals.
4. Steel suspended members U 51 x 32 x 0.6mm thick at 1200mm intervals.
5. Perimeter angle L 50 x 50 x 0.6mm.
6. M8 steel anchor bolts at 500mm centres.
7. M4 self-tapping screws at nominal 200mm centres.
8. PROMASEAL®-A Acrylic Sealant to seal gaps on irregularities surface.
9. Masonry wall.

Promat

PROMATECT®-100 1.5-hour fire rated suspended ceiling

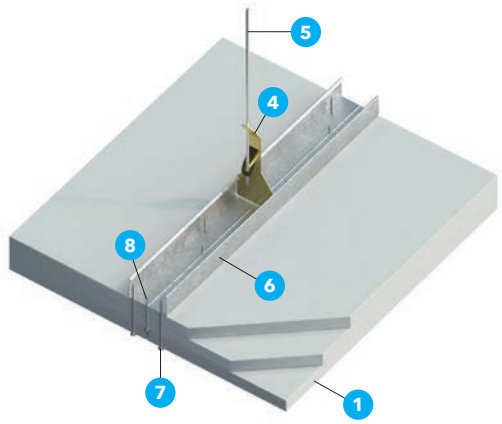


Fire Resistance	FRL	-/90/90	Model number: P100.14.90-S.EN
	Standard	EN 1364: Part 2 (Non loadbearing)	
Acoustic	STC Rw	36 36dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	

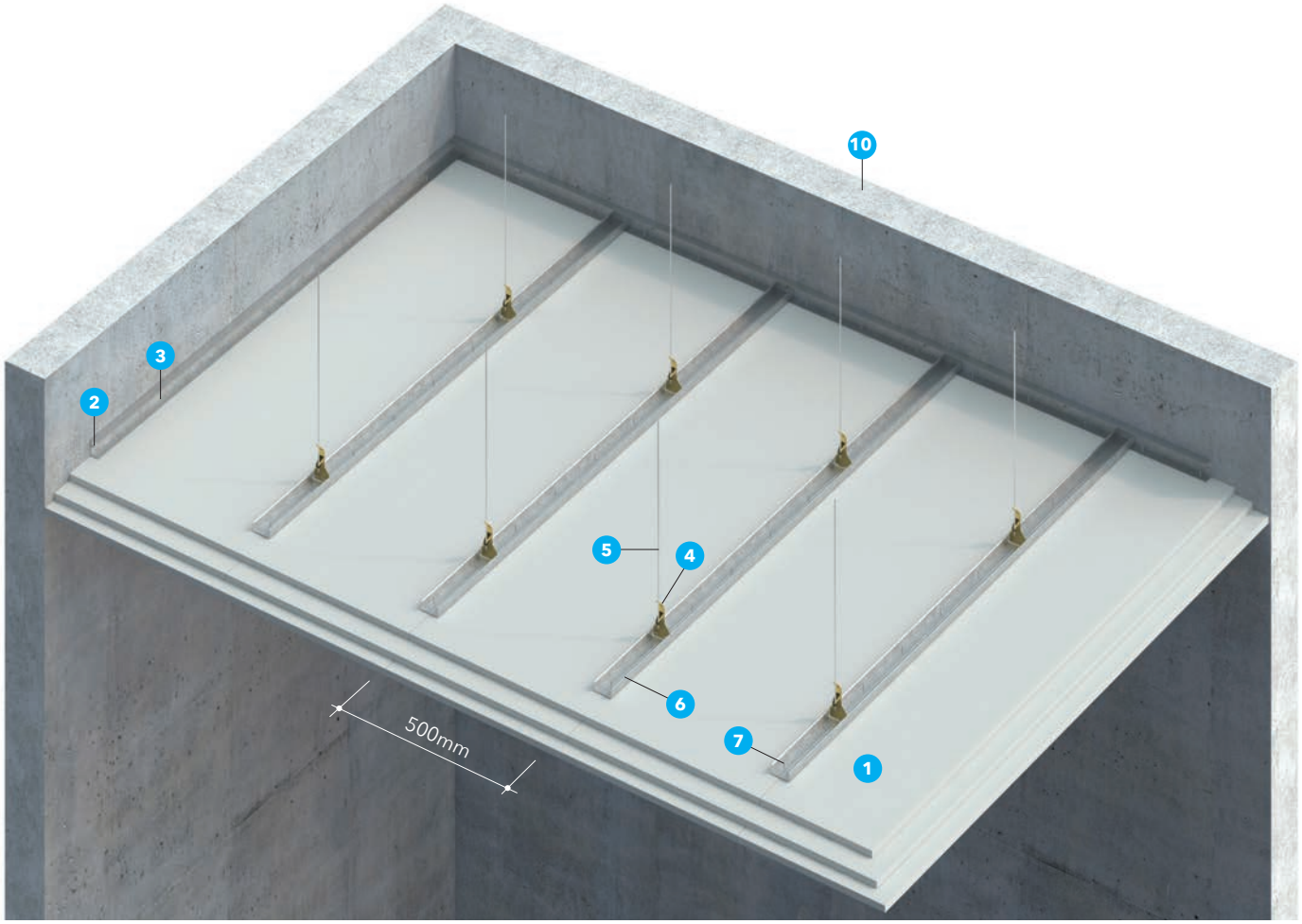
1. Two layers of PROMATECT® 100 20mm thick installed in staggered joints minimum 300mm between boards.
2. Perimeter steel angle L 40 x 40 x 0.7mm thick.
3. M6 steel anchor bolt at 500mm centres.
4. Steel hanger bracket 58 x 120 x 22mm at 500mm intervals.
5. Intermediate steel channel support C 60 x 27 x 7 x 0.6mm thick at 600mm centres.
6. M4 self-tapping screws at nominal 200mm centres.
7. PROMASEAL®-A Acrylic Sealant to seal gaps on irregularities surface.
8. Masonry wall.

Promat

PROMATECT®-100 2-hour fire rated suspended ceiling



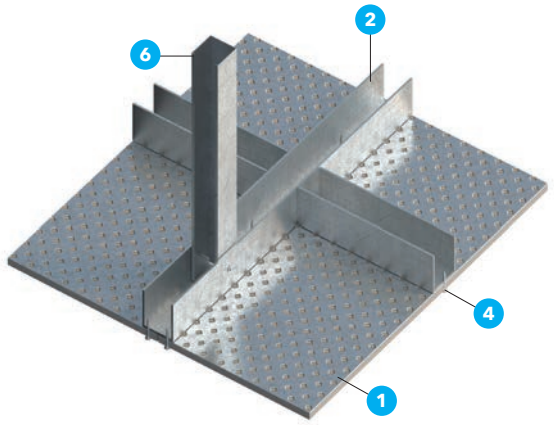
Fire Resistance	FRL	-/120/120	Model number: P100.14.12-S.EN
	Standard	EN 1364: Part 2 (Non loadbearing)	
Acoustic	STC Rw	38 38dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



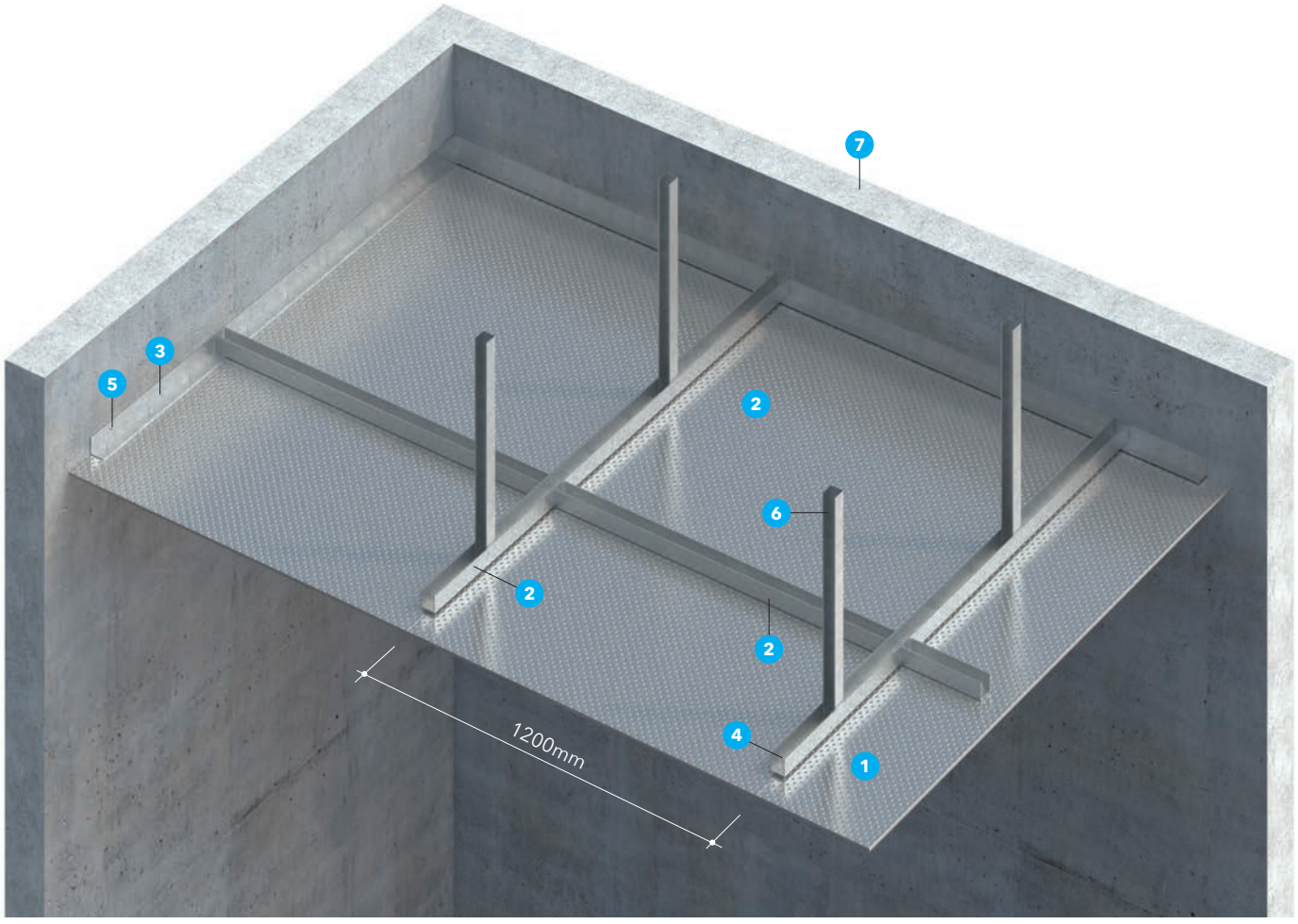
1. Three layers of PROMATECT® 100 15mm thick installed in staggered joints between boards.
2. Perimeter steel Channel U 48 x 28 x 27 x 0.6mm thick.
3. M6 steel anchor bolt at 500mm centres.
4. Steel hanger bracket 58 x 120 x 22mm at 500mm intervals.
5. Steel hanger rod min. 6mm diameter
6. Intermediate steel channel support C 60 x 27 x 7 x 0.6mm thick at 500mm intervals.
7. 70mm self-tapping screws at nominal 200mm centres.
8. 45mm self-tapping screws at nominal 200mm centres.
9. PROMASEAL®-A Acrylic Sealant to seal gaps on irregularities surface.
10. Masonry wall.

Promat

PROMATECT®-S 4-hour fire rated suspended ceiling (Integrity only)



Fire Resistance	FRL	-/240/-	Model number: PS.14.24.E-S
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	STC Rw	36 36dB Margin of error is generally within ±3dB, depending on cavity depth	
	Standard	ASTM E492, E413 ISO 717: Part 1: 1996	



1. One layer of PROMATECT®-S 9.5mm thick.
2. Steel channel C-50mm x 50mm x 3mm thick at nominal 1200mm centres.
3. Perimeter steel angles L-50mm x 50mm x 3mm thick.
4. M5.5 Tek screws at nominal 200mm centres.
5. M10 Steel anchors at nominal 500mm centres.
6. Hanger support C-50mm x 50mm x 3mm thick at nominal 1200m centres.
7. Masonry wall.

Promat

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Promat Asia Pacific

GLOBAL EXPERT IN PASSIVE FIRE PROTECTION

Promat is the expert and worldwide reference in passive fire protection and high-performance insulation for the construction sector and a large number of industrial markets. We offer sustainable solutions that protect lives and assets, enhance comfort, optimise process efficiency, minimise the loss of space and energy and help reduce CO_2 emissions.

Since 1958 — For over 60 years, Promat has been dedicated to designing, testing, and manufacturing comprehensive passive fire protection products and systems.

Conducting over 200 fire tests annually, we ensure our products and systems meet the highest international standards and regulations.

We understand your local fire safety regulations, offering the most efficient passive fire protection tailored to your unique building project.

All our systems have been tested and have obtained certificates from the local authorities.

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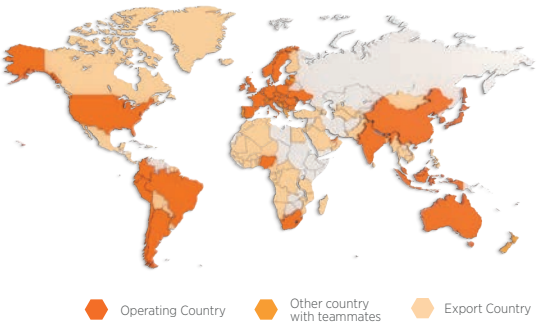
About Etex

Etex is a global building material manufacturer and pioneer in lightweight construction. Etex wants to inspire people around the world to build living spaces that are ever more safe, sustainable, smart and beautiful.

Founded in 1905, headquartered in Zaventem, Belgium, Etex is a family-owned company with more than 13,500 employees globally. It operates more than 160 sites in 45 countries and recorded a revenue of EUR 3.7 billion in 2022. Etex fosters a collaborative and caring culture, a pioneering spirit and a passion to always do better for its customers.



Etex has five R&D centres supporting five global divisions:

- Building Performance: dry construction solutions including plasterboards and fibre cement boards, plasters and formulated products, passive fire protection and associated products.
- Exteriors: a range of aesthetic fibre cement materials for use in agriculture, architectural and residential exteriors.
- Industry: fire protection and high-performance insulation products for the construction and OEM (Original Equipment Manufacturer) industries.
- Insulation: glass mineral wool and extruded polystyrene (XPS) for thermal and acoustic insulation.
- New Ways: high-tech offsite modular solutions based on wood and steel framing.

Etex's global portfolio includes leading commercial brands such as Promat, Kalsi, Siniat, Equitone, Eternit, Cedral, Durlock, Gyplac, Pladur, Superboard and URSA.

Etex is Inspiring Ways of Living, for more information, please visit our website: www.etexgroup.com