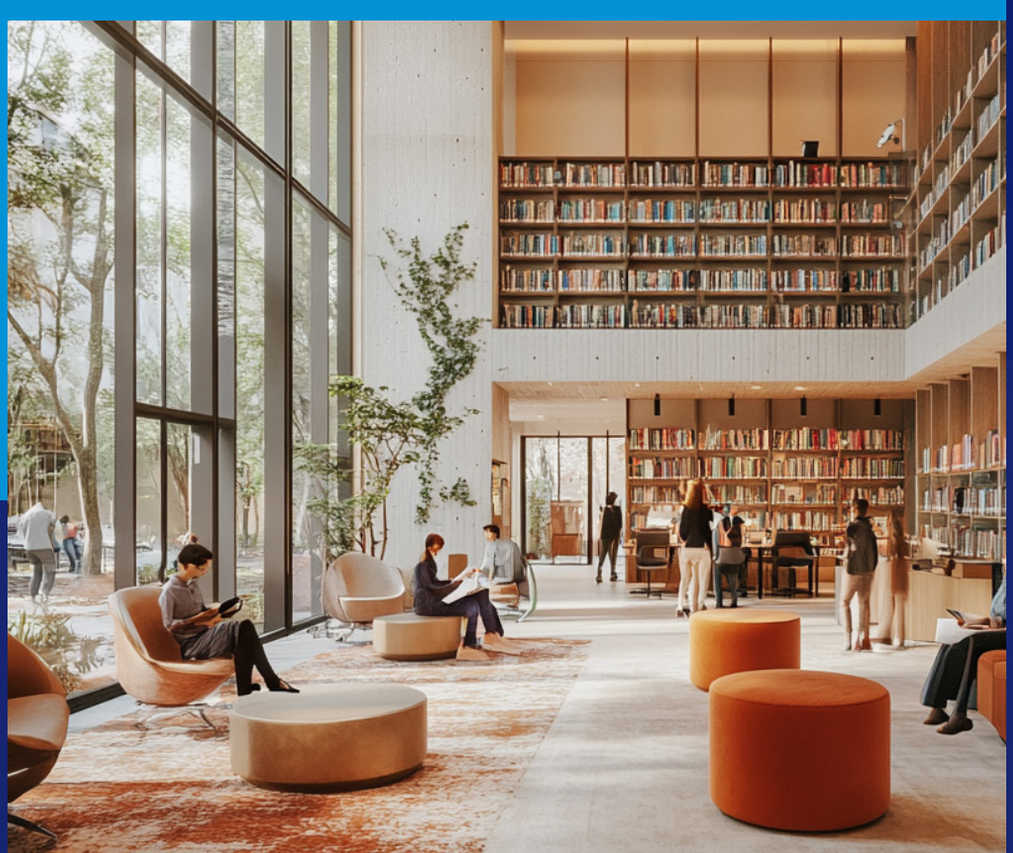
Promat

by etex

PROMATECT-H

Systems and Solutions



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Promatect-H Calcium Silicate Board

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PROMATECT®-H

Calcium Silicate Board

GENERAL TECHNICAL PROPERTIES

Product generic description	non-combustible, fire-resisting calcium silicate board	
Combustibility	DIN 4102, Part 1 BS 474 Part 4 EN 13501-1A1 (Classification Report WFRCent 11527C)	Non-combustible
Board format (length x width)	mm	1220 x 2440
Tolerance on length and width	mm	± 0.3
Board thickness	mm	9
Tolerances on thickness	mm	± 0.5
Density (nominal, oven dry)	Kg/m^3	ca. 870
Alkalinity (approximate)	pH	12
Thermal conductivity λ	W/mK	ca. 0.175 (at 20°C)
Water absorption	g/m^2	0.50
Moisture diffusion resistance	μ	ca. 20
Typical moisture content (at EMC)	%	5 - 10
Surface conditions	Front face: smooth, un-sanded Back face: textured and sanded Colour: beige, white	
Storage	Store on flat surface in a dry area	

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 dependant on the test methods used. If a particular value is of prime importance for a specification, please consult ETEX SA.

Fire protection thickness

Fire protection thickness requirements are often specified in the owner operator's engineering codes of practice.

For more information contact ETEX SA:
Tel: 011 389 4500 / Email: contactus.etexsa@etexgroup.com

Introduction

PROMATECT®-H is a non-combustible matrix engineered mineral board reinforced with selected fibres and fillers. It is formulated without the use of formaldehyde.

PROMATECT®-H is off-white in colour and has a smooth finish on one face with a sanded reverse face. The board can be left undecorated or easily finished with paint.

PROMATECT®-H 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.

Advantages

- → Resistant to the effects of moisture
- → Will not physically deteriorate when used in damp or humid conditions
- → Performance characteristics are not degraded by age or moisture

Applications

- → Tunnel lining, concrete floor and wall upgrading
- → M&E Services enclosure
- → Access panels and hatches, fire doors
- → Structural steel protection
- → Membrane ceilings
- → Cladding to steel ducts, self-supporting ducts

Quality assurance

Promat products are manufactured to stringent quality control systems to assure that our customers receive materials made to the highest standards.

Operating to these standards means that all activities, which have a bearing upon quality, are set out in written procedures.

Systematic and thorough checks are made on all materials and their usage. Test equipment is subject to regular checks and is referred back to national standards.

The information given in this data sheet is based on actual tests and is believed to be typical of the product. No guarantee of results is implied, however, since conditions of use are beyond our control.

LOADING, STORAGE AND HANDLING

1.2.1 Loading/unloading

PROMATECT®-H boards are supplied on pallets suitable for forklift unloading. If off-loading by crane and slings is envisaged, care should be taken to avoid damaging edges of the boards. All pallets and crates can be safely handled by using a forklift or hoisting equipment and straps. Steel cables or chains should not be used as they will damage both the pallet and the boards. Where crates are removed from a box container, care should be taken not to subject crates and pallets to any impact shock, as this could result in cracking of the boards.

Always drive the delivery vehicle as close as possible to where the boards are to be used. When transporting the boards, it is essential to secure the pallets to prevent sliding. If the boards are subsequently moved around the site, they should be placed on a rigid base suitable for lifting by forklift. Promat boards should always be stored on a rigid base.

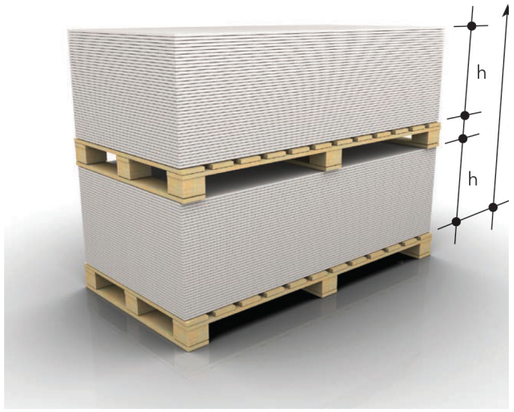
1.2.2 Storage

PROMATECT®-H boards are supplied with protective plastic sheet wrapped around the timber crates. This protection should not be removed until the boards are ready for use.

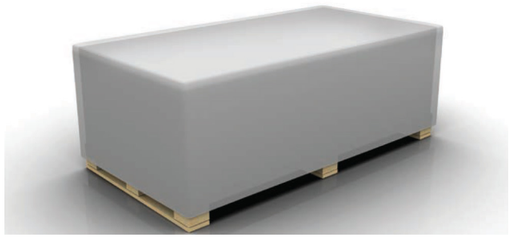
In general, the following steps should be taken to ensure that the boards remain in good condition during storage:

a) The boards should be stored and stacked on covered and dry, level ground, away from the working area or mechanical plant.

b) Pallets should be a maximum of 800 mm height (h ≤ 800 mm) on firm level ground. If two or more pallets are stacked, the total stack height must be less than 3200 mm (H ≤ 3200 mm).



c) The stacked boards must be stored under cover completely for protection from inclement weather.



1.2.3 Handling

Following recommendation must be always taken into account when handling the PROMATECT®-H boards:

a) Wherever possible, always lift the boards from underside rather than slide the boards on each other on the stack to prevent damage or scratches on the surface of the boards.

b) Always carry the boards on edge but do not store on the edge.

CUTTING OF BOARDS

Promat recommends that all cutting be carried out in well-ventilated spaces, using dust extraction facilities. Operators should wear protective face masks at all times.

There are a wide variety of applications and fixing methods possible with PROMATECT®-H boards. The method to be used is dependent on a number of factors, including:

1) The shape of the board's final application, be it square, rectangular, or circular etc.

2) The location where the work is to be carried out, be it industrial, commercial, on or off-site etc.

3) The quality of workmanship required.

PROMATECT®-H boards can be cut on site fairly easily. However, if a large number of boards are to be cut, it is recommended that cutting is carried out off-site under controlled conditions as much as possible to ensure good quality of finished edges etc.

A few general rules should be observed when working with the boards as follows:

- → For industrial quality cutting and extended cutting periods or tools, working with diamond tipped saws is recommended. Experience shows that tools with tungsten carbide blades provide a more than adequate cut.
- → High-speed electric tools generate very fine dust. Inhaling fine dust can be harmful to health, dust extraction equipment or wet cutting is thus necessary. Although PROMATECT®-H boards contain no harmful fibers, inhalation of excessive nuisance dust can be detrimental. It is also recommended that when cutting or drilling the boards, appropriate face masks and personal protection equipment (PPE) should always be worn.
- → Slow running tools produce coarse dust or chips but are not so efficient at cutting.
- → The speed of cutting is best determined by thickness of the board, hardness of the board, and condition of the blade.
- → Boards must be held securely during cutting to avoid slippage and vibration which can lead to chipping of the board edges.
- → The choice of the most appropriate tool for use in each country will depend on custom, practice, and local regulations.

1.3.1 Guillotine

The knife of the guillotine is parallel to the board support so that a consistent, even cut is made at the same moment over the entire length of the board. Up to a maximum thickness of 6 mm, a reasonably neat, square cut can be achieved but the edge remains rough. The machine cuts the sheets one by one and is not suitable for textured surfaces.

1.3.2 Tungsten carbide blades

Tungsten carbide tipped saws can be used with either a high or low-speed electric motor. The cutting is done in a dry state so dust extraction is essential. The tungsten carbide teeth of the saw have a shorter lifespan than diamond-tipped blades but they can be sharpened by a skilled professional.

1.3.3 Diamond tipped blades

Cutting with diamond tipped blades is carried out using a high-speed electric motor at 2500-3000 rpm depending on the diameter of the blade. There are two types:

1) Machine with fixed table and moving saw support

2) Machine with fixed saw support and moving table

The saw support can be equipped with several parallel saws for multi-cutting in a single pass of the blades over the boards. A diamond-tipped blade can be used in either a wet or dry state.

The disadvantage of wet cutting is the generation of cement slurry, which forms from the mixture of the dust and water. This must be drained off in an appropriate way. In addition, it is necessary to rinse the saw after each use to maintain the cutting quality. Wet cutting is not an ideal solution for PROMATECT®-H boards.

The boards should be cleaned after cutting to avoid leaving any dust on the surface.

Diamond blades can be used to cut more than one board at a time, depending on the diameter of the saw blade and the thickness of the boards.

1.3.4 Industrial machines

Industrial machines are used for continuous cutting over long periods of time, for large quantities, and for better efficiency. Standard industrial machines are for dry cutting and are available in high and low-speed electric motors.

High-speed electric motors with diamond-tipped blades can be used for other building materials such as concrete, natural stone, brick etc. Low-speed motors with tungsten carbide tipped blades are more suitable for cutting fiber cement materials.

Cutting PROMATECT®-H boards with low-speed motors provides a neat cut and smooth edges.

1.3.5 On-site machines

While working at the site, hand tools and low-speed electric tools are generally recommended. When high-speed electric tools are used, dust extraction is essential.

Power tools with dust extraction equipment

Sawing machines such as FESTO, Bosch, Makita, etc., work with a tungsten carbide tipped saw blade on a low-speed electric motor and move over a fixed working table. It is a typical machine for occasional use on-site, producing very good results and is capable of cutting boards with a maximum thickness up to 25 mm.

A vacuum cleaner is recommended for use while cutting, especially when using power saws. As an additional safety precaution, always wear eye, ear, and dust protection when using power tools of any type. A portable version of the working table is available for the convenience of board cutting on-site.

While working with power saws, the following important points should be observed:

- → Ensure that the boards to be cut are continuously and well supported on either side of the cut.
- → A straight edge should be clamped in position to guide the cutting operation.
- → Care must be taken to ensure the tool remains against the straight edge during the cutting operation.
- → The cutting rate should be such that the blade is not labouring or over-heating. Feed speed for fibre cement boards is normally slower than for natural timber.

Jigsaw

This is applicable for panels up to 25 mm thick. The panels can be cut easily with a jigsaw to form various shapes. Blades with special hardened teeth are available for cutting the boards. As with all power tools, care should be taken to cut within the capacity of the tool and blade. Do not force the cutting speed.

Hand saw

Hand sawing is suitable for general cutting operations and for small cuts, notchings, or small penetrations. However, this method of cutting can be rather time-intensive. The fastest way is to allow the saw to work at its own speed; trying to force the tool to cut faster merely blunts the teeth.

Drilling

Drilling can be carried out either by hand drill or any conventional power drill with or without dust extraction. For best results, the boards should be firmly supported behind the location of the holes. Generally, when working on PROMATECT®-H boards, the use of drills with point angles of 60° to 80°, rather than the more usual 120° type, are preferable and more efficient.

FIXING

PROMATECT®-H boards are easy to handle and work using conventional tools. However, basic standard safety precautions should be routine at all times during installation.

This section highlights some general guidance in fixing and fabrication of the boards for fire-resistant applications. Following tools are recommended:

The type of fixings used when installing PROMATECT®-H boards are important as they determine the support of joints and stability of a structure. In general, a fixing should meet these rules and requirements:

1. Corrosion resistant.

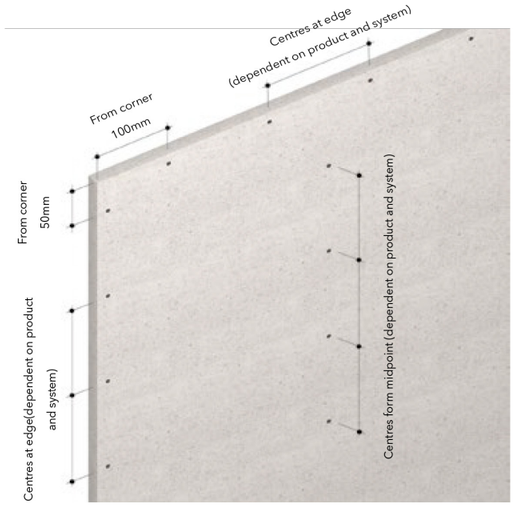
2. Stainless steel or galvanized nails are recommended for timber framing. Do not use screws when the board forms part of the structural bracing, unless tested with such fixings.

3. Stainless steel, zinc, or other plated self-drilling screws are recommended for steel framing.

4. Fixing points should be located at least 12 mm from the board edge and 50 mm and 100 mm from board corners. Nominal centers of fixing are generally recommended at 200 mm throughout this handbook.

Use below fixing guide in conjunction with the illustration:

From edge	From corner	Centres at edge	Centres at midpoint
Minimum 12 mm	50 mm and 100 mm	Depends on product and system. Please consult Promat.	



1.4.2 Screw fixing

When fixing PROMATECT®-H boards, especially to steel frames, the following should be noted:

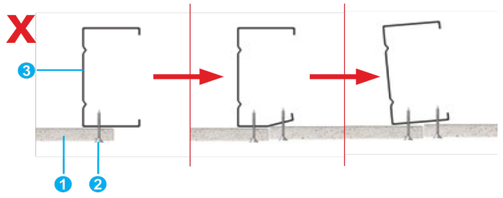
- → Always predrill fixing holes unless using specially designed self-drilling screws suitable for fixing fibre cement to steel.
- → Use a high-torque, variable-speed screw gun fitted with a depth gauge.
- → Do not overdrive, as this may reduce the holding capacity of the screw. Reduce drill speed as the screw pulls the board against the framing.

When fixing to steel framing, always fix to the open side of the flange first in order to maintain a flush outside face (see the illustration for the correct sequence of installation).

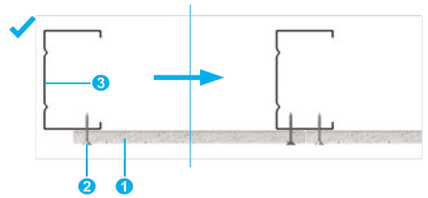
Pilot holes should be predrilled not less than 12 mm from the edge of the boards and countersunk if required. Use self-drilling or self-tapping screws when securing boards to steel.

In most other situations, drywall screws (e.g., Hilo) are generally suitable. Board thicknesses greater than 15 mm can be screwed board to board.

Self-drilling or self-tapping screws are suitable. If fixing board to board, minimum screw penetration should be 25 mm or twice the board thickness, whichever is greater. If screws do not have a deep thread, pilot holes should be drilled, and care should be taken not to over-turn or over-drive. Screws should be 50 mm and 100 mm from corners.



INCORRECT sequence of fixing to steel stud



CORRECT sequence of fixing to steel stud

1. Promat board of appropriate thickness
2. Stainless steel or galvanised fixings of appropriate size and length
3. Steel stud of appropriate thickness and dimensions

HOLE CUTTING

Apertures often need to be cut within a board to allow for penetration of services such as switchboxes, lights, access panels, etc. The following procedures serve as general guidelines only. Any method that allows for cutting of holes without damaging the board is acceptable.

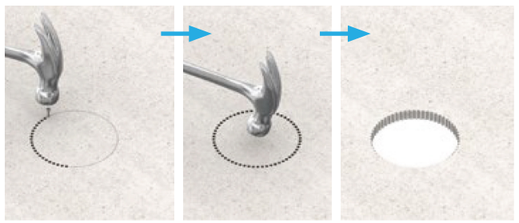
1) For smooth, clean cut circular holes:

- → Mark the center of the hole on the board.
- → Predrill a hole to be used as a guide.
- → Cut the hole to the required diameter using a hole saw fitted to a heavy-duty electric drill where the central bit is inserted into the predrilled hole or use a jigsaw.

2) For small irregular holes:

- → Small rectangular apertures can be achieved by forming a series of small holes (using a drill) around the perimeter of the opening.
- → Carefully tap out the waste piece from the panel face. Make sure that the edges are properly supported to avoid damage to boards.
- → Rough edges can be cleaned with a rasp or 40 grit glass paper.

Below example of nailing and hammering for openings:

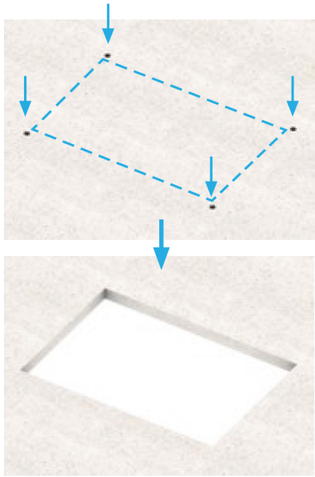


3) For large openings or apertures:

- → Score deeply around the perimeter of the opening using a sharp tool (for thin boards only).
- → Form a large round hole in the center using the method previously described.
- → Saw cut from the center towards the corners of the opening.
- → Tap waste pieces from the face side and, if necessary, clean rough edges with a rasp or at least 40 grit sandpaper. Radius corners with a half-round rasp to eliminate any stress points.

Alternatively, for neater openings:

- → Predrill a hole of at least 10 mm diameter at the four corners of the openings. Mark lines from hole to hole (forming a rectangular shape) as a guide and cut along the lines using a jigsaw or hand saw.
- → Clean rough edges of the hole with a rasp.



Apertures opening using alternative method: Never make holes by using heavy hammers, cold chisels, or other "aggressive" methods. This will damage the underside of the boards and adversely affect the fire performance of the system.

JOINTING

PROMATECT®-H boards can be simply butt jointed with sheets having square edges. If required, a filler may be used to finish joints before decoration.

Flush jointing is applicable to most partition and ceiling constructions. However, in some instances, it may also be applicable to external wall constructions.

Generally, installations of concealed framed ceiling and partition systems require crack-free flush jointing. The method of constructing flush joints depends very much on the skills and expertise of the installer, as well as the stability of the supporting construction.

It is recommended that the thickness of panels used for flush jointing should be at least 7 mm thick. Thinner boards are used only when they are to be rendered with synthetic binders or textures at a later stage.

Following are some guidelines for joint finishing that will help achieve the required professional appearance. To obtain a good flush joint, it is important that all panels have bevelled or recessed edges at the side where they abut other panels.

Note that when a panel is cut to size on site, the bevel or recessed edge is often cut away. For a flush finish, a flush joint filler with a double trowel width is required unless the recess is re-applied.

When the boards are ready for joint treatments, follow the steps below to obtain the required finish:

a) After the installation of the boards, wait until the moisture content in the sheet is equivalent with that of the ambient atmosphere. This will normally take approximately 24 to 48 hours to achieve. Once equilibrium moisture content is achieved, moisture-induced movement will be lower, reducing the risk of joint cracking.

b) Clean the surface of the joint and surrounding area (approximately 300 mm in width on each side of the joint).

c) Always work with clean tools and containers.

d) The work should be carried out in an environment where the ambient air temperature is at least 5°C or above.

e) Prepare the joint filler as per instructions prescribed by the filler manufacturer. Always use clean water.

f) Fill the joint with sufficient joint filler.

g) Apply a layer of reinforcing fibre mesh tape over the filler and with a spatula cover the complete surface of the tape with an excessive amount of well-embedded joint filler.

h) Allow to dry completely and sand the surface slightly with fine-grade sandpaper.

i) Apply a second layer of joint filler with a wide trowel.

j) Wait until it is completely cured and sand the surface again slightly with the same grade of sandpaper.

k) Depending on the level of finish required, an eventual final layer of joint finisher can be applied with a 280 mm wide (preferably curved) trowel.

Normally, joint fillers manufactured for use with plasterboards are suitable for flush jointing of Promat boards when installed within dry areas.

If primer is not going to be used, it is recommended that the areas to which the filler will be applied are pre-soaked. This prevents moisture from the filler being absorbed too rapidly into the boards and reduces the risk of cracking and/or delamination of the filler.

FINISHING

1.6.1 Plastering

PROMATECT®-H boards have a high suction factor, and while successful skim coats are relatively easy to obtain, some care is needed to retard the rapid drying of plaster coats, especially in areas of high temperature.

It is recommended that a small test area is plastered initially to ensure that the boards have been adequately sealed. Use of self-adhesive or hessian scrim applied over joints and internal angles is considerable. Paper scrim is not recommended.

The bonding agent and plaster manufacturer's recommendations must be followed at all times.

1.6.2 Tiling

PROMATECT®-H boards can be tiled, provided due consideration is given to the installation of the boards and the requirements for additional framing prior to applying the tiles.

It should be noted that all board application systems are used for their fire resistance performance. Therefore, placing additional weight on an application system, such as ceramic or marble tiling, for instance, can have a significant effect on the overall fire resistance performance of the system.

As such, additional framing is required for partition systems, etc., which bear the weight of tiles in order to maintain the fire resistance performance.

As a general rule of thumb, partition systems to be tiled should be constructed with framing at nominal 450 mm centres in both vertical and horizontal orientations. Minimum board thickness is applicable.

Care must be taken in sealing the boards thoroughly before applying any tile adhesive as the boards' high suction load will accelerate the setting time of the tile adhesive.

1.6.3 Painting

All coatings should be supplied by a reputable manufacturer, and their recommendations regarding surface preparation, sealing, and finish coating should be followed at all times.

When using water-based paints, a diluted first coat is recommended. For oil-based paints, a suitable alkali-resisting primer should be used. Painted vapour barriers may be formed by the application of chlorinated rubber, epoxy resin, or polyurethane paint.

Depending on the type of finish required and the viewing circumstances (e.g., under glancing light), some minor surface imperfections of the painting result may occur.

GENERAL INFORMATION ON CEILINGS & WALLS

Promat's ceiling systems require less material to achieve similar fire-resistant levels when compared to the industry average systems. This can lead to more simplified construction methods than the standard equivalent. Use of PROMATECT®-H boards therefore helps to increase productivity and reduce overall installation costs.

These ceiling systems have been developed by Promat to satisfy standard requirements for internal applications. Their advantages include:

- Time and cost-effectiveness
  Simple construction methods reduce installation cost and time compared to traditional systems.
- Lightweight
  Lighter loads on structures compared to industry average systems for equivalent fire resistance.
- Thermal resistance
  Excellent thermal resistance performance.
- Design flexibility
  Lighter weight allows increased ceiling span, reduced support structure sizes, and/or reduced system thickness.
- Acoustic performance
  Tested and assessed to both ISO 140-3: 1995 and ISO 717-1: 1996 to meet the needs of industry.

2.1 Board fixing

Longitudinal board joints must coincide with steel framing members. If one layer of boards is used, the transverse joints must be backed with fillet strips made of PROMATECT®-H boards (or timber noggings for traditional timber joist construction). For boards laminated in two layers, the joints must be staggered by a minimum of 600 mm.

PROMATECT®-H boards may be fixed to the steel framework using No.8 bugle head self-drilling and self-tapping screws. No.8 woodscrews are recommended 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.

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

2.2 Design considerations

Following are some of the factors to consider when determining the correct specifications that ensure a ceiling system provides the required performance under both fire and ambient conditions. Please seek Promat for comprehensive advice.

2.2.1 Supporting structure design

The design of the framing system should be adequate for the design loads of the ceiling. PROMATECT®-H ceiling systems are designed for steel (or timber) framing.

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 a few factors, i.e., ceiling span, movement, and deflection, and the local regulations.

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

2.2.2 Non-loadbearing ceilings

PROMATECT®-H non-loadbearing ceiling systems can be generally divided into steel frame suspended ceiling and self-supporting membrane ceiling. The steel framing as specified 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 can accommodate the required expansion of steel at an elevated temperature.

All non-loadbearing ceiling systems featured in this handbook are not trafficable. Please consult Promat for the design and installation of trafficable ceiling systems that are suitable for maintenance purposes.

2.2.3 Loadbearing ceilings

PROMATECT®-H loadbearing ceiling systems are usually comprised of steel joists. Flooring material, joist type, thickness, and jointing are all critical for a specified design performance. The steel joist framing members must be designed in accordance with the criteria of BS 5950: 2000.

2.2.4 Acoustic performance

PROMATECT®-H ceiling systems meet specific acoustic requirements, including ratings for sound transmission, sound impact, and sound absorption. Please refer to page 20 for more information.

2.2.5 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 a ceiling dimension exceeds 10 m in either direction, a control joint should be used. Control joints should 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. These openings have to be properly treated with approved fire stopping materials from Promat.

2.2.6 Caulking and service penetration seals

To maintain fire resistance and/or acoustic performance of a ceiling system, perimeter and other gaps must be appropriately filled with suitable caulking material. PROMASEAL®-A Acrylic Sealant or other tested/approved fire and acoustic resistant material of equivalent or greater performance is recommended.

Care should be taken in detailing a suitable fire stopping system around any service penetrations at the ceiling to ensure that:

a) the fire stopping material remains in situ,

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

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

Allowance should be made for thermal movement of the penetrating services in both ambient and fire conditions to ensure that unacceptable loads are not applied to the ceiling assembly. Examples of penetrating services include electrical cables, electrical conduits or wires, plastic and metal pipes, air conditioning and ventilation ductwork. Please contact Promat for more information on fire stopping/penetration seals of these services.

2.2.7 Light fittings

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

2.2.8 Access panels and hatches

Where access into a ceiling void is required, panels and hatches are required to be installed. Please consult Promat for details.

2.2.9 Impact resistance

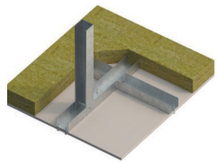
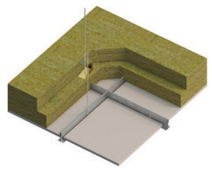
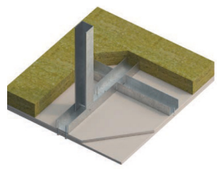
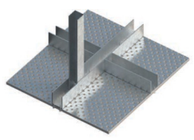
PROMATECT®-H boards can be applied for particularly robust ceiling systems that are highly resistant to impact and abrasion.

Conclusion

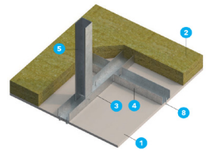
Most building regulations stipulate limitations on the use of fire protection suspended ceilings in certain situations. Care should be taken, therefore, that the use of a suspended ceiling system is acceptable to the approval authorities.

SUSPENDED NON- LOADBEARING CEILINGS

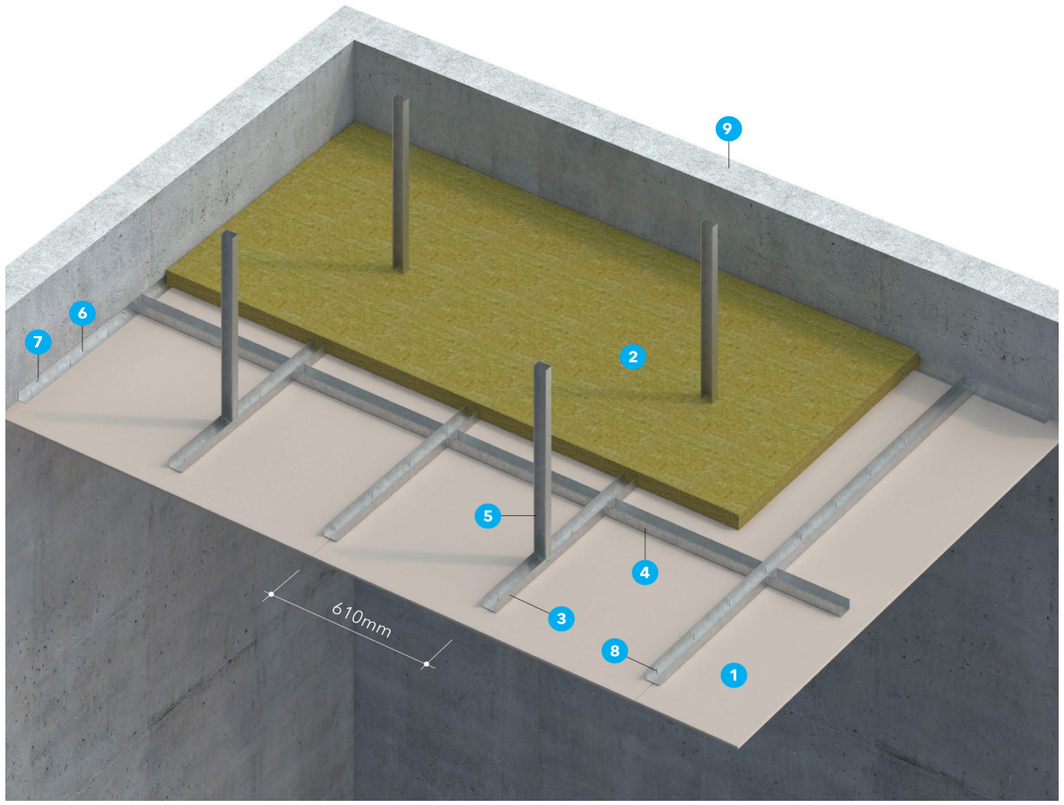
SUSPENDED CEILINGS

Ceiling type	Model number	Fire resistance performance	Test standard	Page no.
 PROMATECT®-H 1-hour fire rated suspended ceiling membrane	PH.14.60-S	-/60/60	BS 476: Part 22: 1987	34
 PROMATECT®-H 1.5-hour fire rated (Exposed Grid)	PH.14.90-T.EN	-/90/90	BS 1364: Part 2	35
 PROMATECT®-H 2-hour fire rated	PH.14.12-S	-/120/120	BS 476: Part 22: 1987	36
 PROMATECT®-H 4-hour fire rated (Integrity only)	PH.14.24.E-S	-/240/-	BS 476: Part 22: 1987	38

PROMATECT®-H 1-HOUR FIRE RATED SUSPENDED CEILING MEMBRANE

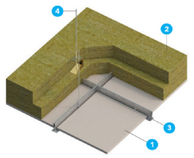


Fire Resistance	**FRL**	-/60/60	Model number: PH.14.60-S
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	**STC** **Rw**	26 27 dB Margin of error: generally within ±3 dB, depending on cavity depth	
	Standard	ASTM E492, E413, ISO 717: Part 1: 1996	

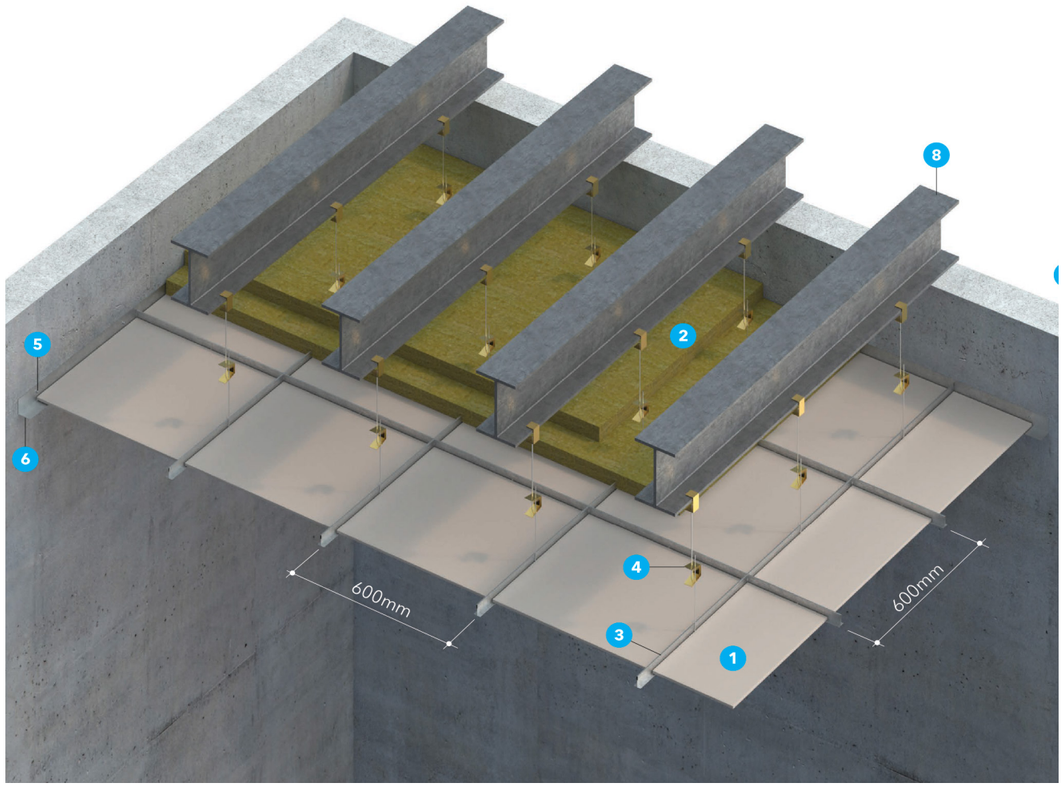


1. One layer of PROMATECT®-H 9 mm thick.
2. Mineral wool, 60 mm x 80 kg/m³ or 50 mm x 100 kg/m³.
3. Main support C-channel 50 x 31 x 0.6 mm at 610 mm intervals & at all board joints.
4. Cross support C-channel 50 x 31 x 0.6 mm at 1220 mm intervals & at all board joints.
5. Steel suspended members at 1220 mm intervals. Stress shall not exceed 3.3 N/mm.
6. Perimeter angle L30 x 30 x 0.6 mm.
7. M6 steel anchor bolts at 500 mm centres.
8. M4 self-tapping screws at 200 mm centres.
9. Masonry wall.

PROMATECT®-H 1.5-HOUR FIRE RATED SUSPENDED CEILING MEMBRANE

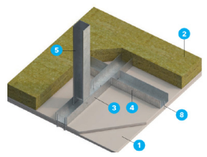


Fire Resistance	**FRL**	-/90/90	Model number: PH.14.90-T.EN
	Standard	EN 1364: Part 2 (Non-loadbearing)	
Acoustic	**STC** **Rw**	26 27 dB Margin of error: generally within ±3 dB, depending on cavity depth	
	Standard	ASTM E492, E413, ISO 717: Part 1: 1996	

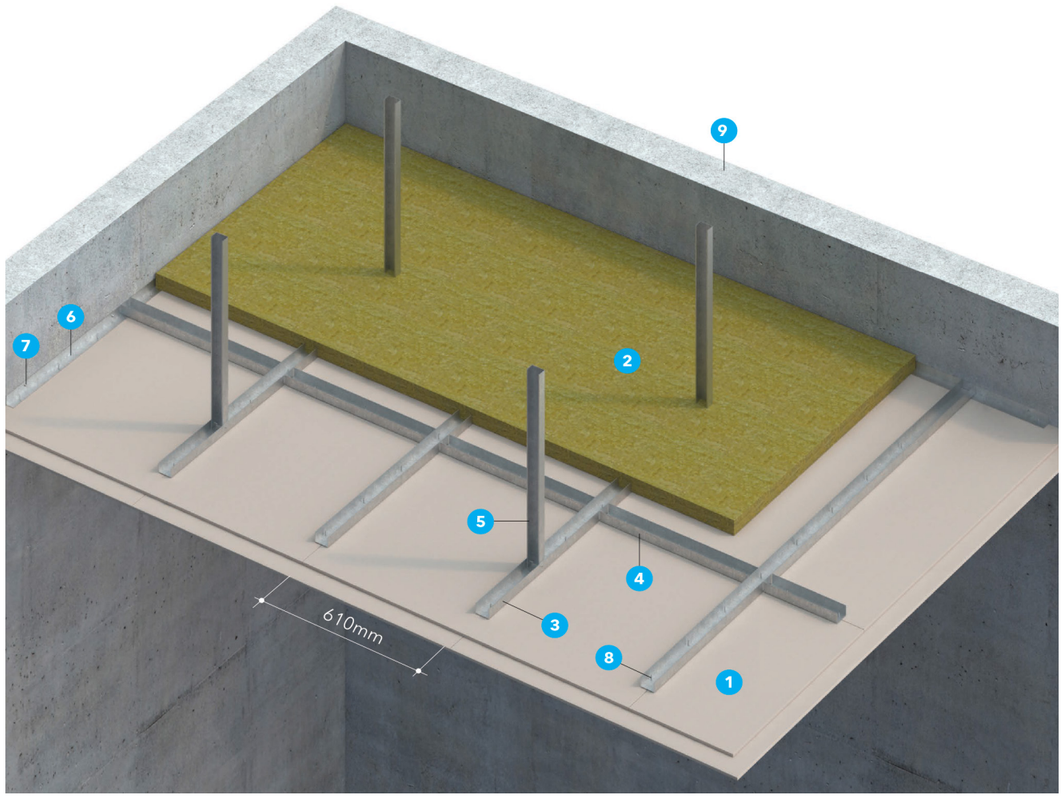


1. One layer of PROMATECT®-H 595 x 595 x 9 mm thick.
2. Mineral wool 2 x 50 mm x 100 kg/m^3.
3. Galvanized steel ceiling runner T-38 x 24 x 0.5 mm in a grid of 610 x 610 mm.
4. Steel hanger.
5. M6 anchor bolts at 500 mm centres.
6. Perimeter angle 50 x 50 x 0.6 mm thick.
7. Masonry wall.
8. Unprotected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

PROMATECT®-H 2-HOUR FIRE RATED SUSPENDED CEILING MEMBRANE

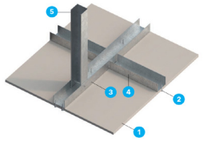


Fire Resistance	**FRL**	-/120/120	Model number: PH.14.12-S
	Standard	BS 476: Part 22: 1987 (Non loadbearing)	
Acoustic	**STC** **Rw**	32 33 dB Margin of error: generally within ±3 dB, depending on cavity depth	
	Standard	ASTM E492, E413, ISO 717: Part 1: 1996	

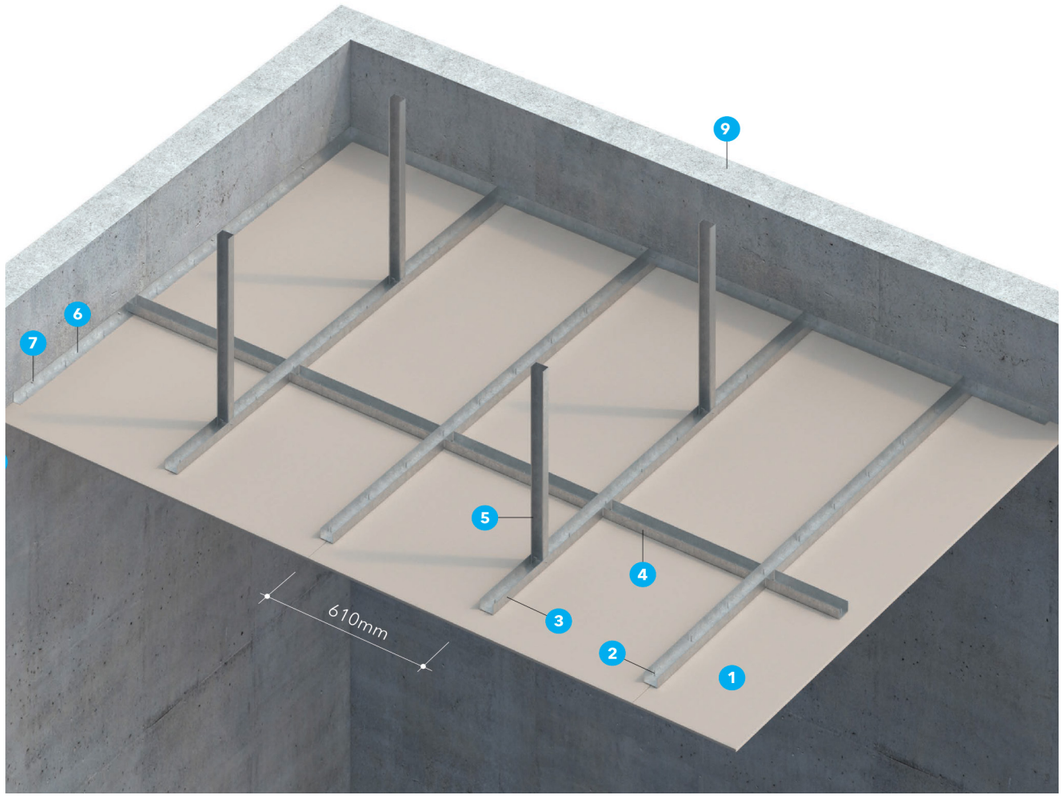


1. Two layers of PROMATECT®-H 9 mm thick staggered joints, minimum 300 mm apart between boards.
2. Mineral wool, 60 mm x 80 kg/m^3 or 50 mm x 100 kg/m^3.
3. Main support C-channel 50 x 31 x 0.6 mm at 610 mm intervals & at all board joints.
4. Cross support C-channel 50 x 31 x 0.6 mm at 1220 mm intervals & at all board joints.
5. Steel suspended members at 1220 mm intervals. Stress shall not exceed 3.3 N/mm.
6. Perimeter angle L30 x 30 x 0.6 mm.
7. M6 steel anchor bolts at 500 mm centres.
8. M4 self-tapping screws at 200 mm centres.
9. Masonry wall.

PROMATECT®-H 4-HOUR FIRE RATED SUSPENDED CEILING MEMBRANE (INTEGRITY ONLY)



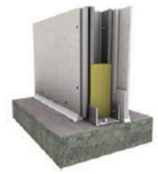
Fire Resistance	**FRL**	-/240/-	Model number: PH.14.24-E-S
	Standard	BS 476: Part 22: 1987 (Non-loadbearing)	
Acoustic	**STC** **Rw**	26 27 dB Margin of error: generally within ±3 dB, depending on cavity depth	
	Standard	ASTM E492, E413, ISO 717: Part 1: 1996	



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

INTERNAL FIRE RATED WALLING SYSTEMS

SUSPENDED CEILINGS

Steel stud partition type	Fire resistance performance	STC	R_w	Board layer and thickness	Typical system weight	Total partition thickness	Page no.
 PROMATECT®-H single steel stud partition (single sided)	-/240/-	27 dB	27 dB	1 x 9 mm	* From 11.58 kg/ m^2	* From 68 mm	BRE CC91456 and WF 159773 to the requirements of BS 476: Part 22: 1987
 PROMATECT®-H single steel stud partition (double sided single layer)	-/60/60	36 dB	40 dB	1 x 9 mm (each side)	* From 30.25 kg/ m^2	* From 86 mm	WF 177939, WARRES 38435, WRCSI 23478, and PSB 545053839/A/WMW to the requirements of BS 476: Part 22: 1987 and/or AS 1530: Part 4: 2005
	-/120/120	38 dB	40 dB	1 x 9 mm (each side)	* From 31.91 kg/ m^2	* From 86 mm	
	-/240/240	43 dB	43 dB	1 x 9 mm (each side)	* From 36.54 kg/ m^2	* From 111 mm	
 PROMATECT®-H single steel stud partition (double sided double layer)	-/240/240	56 dB	55 dB	2 x 9 mm (each side)	* From 53.04 kg/ m^2	* From 136 mm	WF 164275 and EWA 23730-01 to the requirements of BS 476: Part 22: 1987 and/or AS 1530: Part 4: 2005
	-/360/360	56 dB	57 dB	2 x 12 mm (each side)	* From 67.11 kg/ m^2	* From 148 mm	LPC TE6371A to the requirements of BS 476: Part 22: 1987 and/or AS 1530: Part 4: 2005

PROMATECT®-H SINGLE STEEL STUD PARTITION (SINGLE SIDED) — PH 22.24.1

Fire attack from board side / Non-loadbearing

Fire Resistance	**FRL**	-/240/-
	Standard	BS 476: Part 22: 1987
	Approval	BRE CC91456 WF 159773
Acoustic	**STC** **R_w**	27 dB 27 dB
	Standard	ISO 140: Part 3: 1996 ISO 717: Part 1: 1996
	Predicted Assessment	Marshall Day, 18th October 2006
Construction	**Maximum Height**	12000 mm
	Maximum Length	Unlimited
	Partition Thickness	Nominal 68 mm
	Partition Mass	From 11.58 kg/m² (for one layer), From 20.44 kg/m² (for two layers)

1. One layer of PROMATECT®-H board 9 mm thick at one side of the wall for heights up to 6000 mm or two layers of PROMATECT®-H board 9 mm thick each for heights up to 12000 mm. If using a two-layer system, stagger all joints minimum 610 mm.

2. Galvanised steel studs, measurements in accordance with Studs Tables 1–2 below, vertical studs at maximum 610 mm centres (allow appropriate expansion at top horizontal track, no allowance at this track for loadbearing purposes).

3. 40 mm long M6 masonry anchors at nominal 500 mm centres.

4. Caulk all perimeter gaps with PROMASEAL® AN Fire Resistant Acrylic Sealant to achieve stated fire and/or acoustic performance.

5. 25 mm long self-tapping screws at nominal 200 mm centres for the first layer board, and 35 mm long self-tapping screws at nominal 200 mm centres for the second layer board.

*Margin of error is generally within ±3 dB
*Details for walls above 3000 mm high are available on request

Maximum partition height	Stud depth	Minimum stud thickness	Maximum partition thickness	Top track	Clearance at top track
4000 mm	50 mm	0.6 mm	59 mm	52 mm x 35 mm x 0.6 mm	20 mm

VERTICAL SHEETING (SINGLE SIDED) / NON LOADBEARING

1. One layer of PROMATECT®-H board 9mm thick at one side of wall for heights up to 6000mm or two layers of PROMATECT®-H board 9mm thick each for heights up to 12000mm. If using two-layer system, stagger all joints minimum 610mm.

2. Galvanised steel studs, measurements in accordance with Studs Tables 1~2 on page 26, vertical studs at maximum 610mm centres (allow appropriate expansion at top horizontal track, no allowance at this track for loadbearing purposes).

3. 40mm long M6 masonry anchors at nominal 500mm centres.

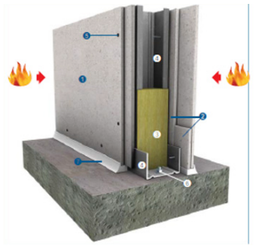
4. Caulk all perimeter gaps with PROMASEAL® AN Fire Resistant Acrylic Sealant to achieve stated fire and/or acoustic performance.

5. 25mm long self-tapping screws at nominal 200mm centres for first layer board, and 35mm long self-tapping screws at nominal 200mm centres for second layer board.

See page 5 for bottom and top track fixings; pages 9 to 13 for details of wall head, wall base, wall junction and wall movement joints.

PROMATECT®-H SINGLE STEEL STUD PARTITION (DOUBLE SIDED SINGLE LAYER)

PH 22.60.1/ 22.12.1/ 22.24.2



Fire attack from both sides / Non-loadbearing

Fire Resistance	**FRL**	-/60/60 -/120/120 -/240/120
	Standard	BS 476: Part 22: 1987 AS 1530: Part 4: 2005
	Approval	WF 177939 WARRES 38435 WRCSI 23478 PSB 545053839/A/WMW
Acoustic	**STC** **R_w**	36 dB (-/60/60), 43 dB (-/240/120) 40 dB (-/60/60), 43 dB (-/240/120)
	Standard	ISO 140: Part 3: 1996, ISO 717: Part 1: 1996
	Predicted Assessment	Marshall Day, 18th October 2006
Construction	**Maximum Height**	12000 mm
	Maximum Length	Unlimited
	Partition Thickness	Nominal 86 mm (-/60/60) Nominal 86 mm (-/120/120) Nominal 111 mm (-/240/120)
	Partition Mass	From 11.58 kg/m^2 (for one layer), From 20.44 kg/m^2 (for two layers)

1. 9 mm thick PROMATECT®-H board at each side of the partition.

2. 100 mm x 2 mm thick PROMATECT®-H cover strips, fixed to steel studs using 25 mm long self-tapping screws at nominal 500 mm centres.

3. Mineral wool infill to cavity between boards (see page 30 for different fire resistance requirements).

4. Galvanised steel studs, measurements in accordance with Studs Tables 1–2 on pages 33 and 34 (allow appropriate expansion at top horizontal track, no allowance at this track for loadbearing purposes).

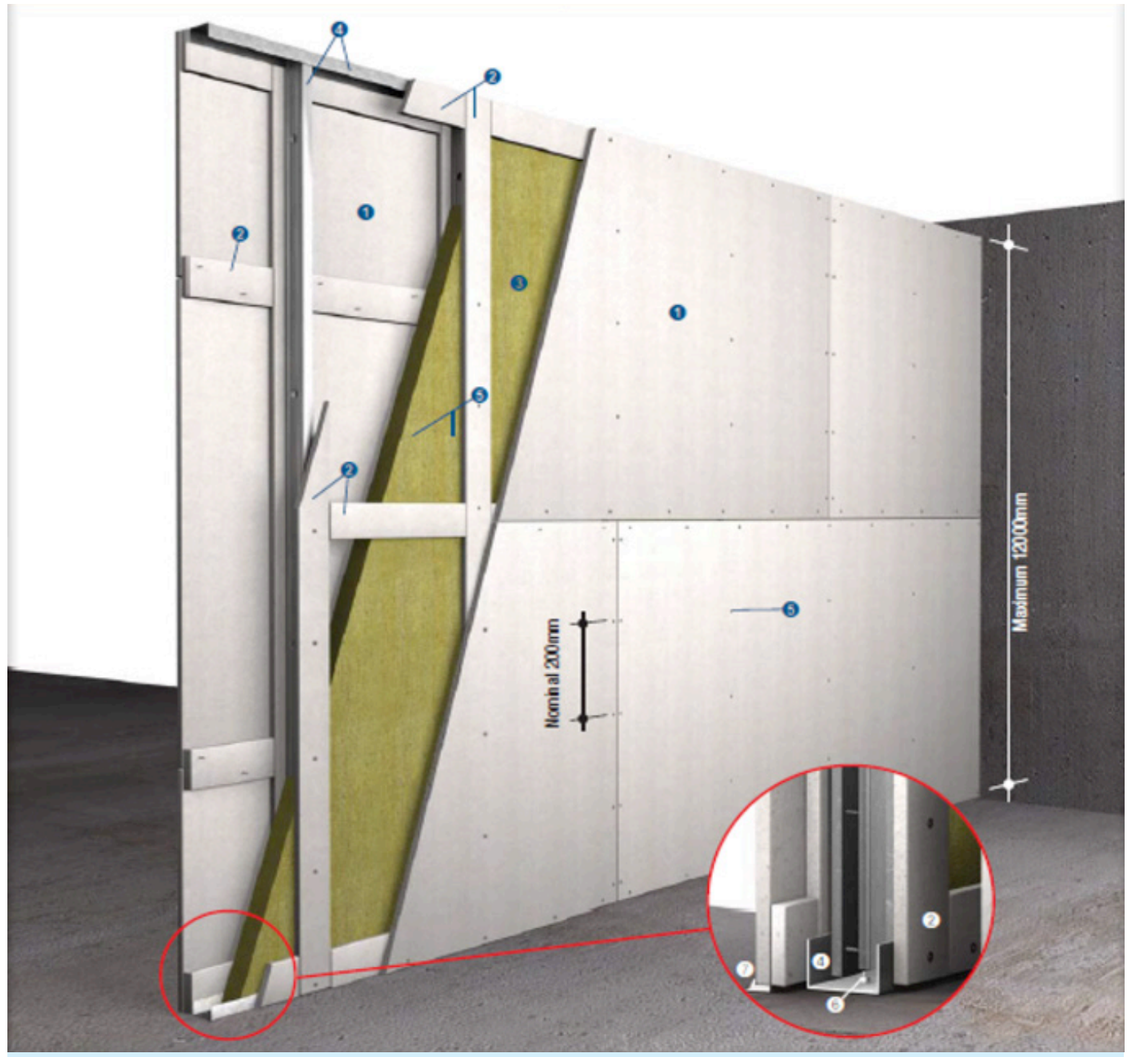
5. 32 mm long self-tapping screws at nominal 200 mm centres.

6. 40 mm long M6 masonry anchors at nominal 500 mm centres.

7. Caulk all perimeter gaps with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance and/or acoustic performance.

*Margin of error is generally within ±3 dB
*Details for walls above 3000 mm high are available on request

HORIZONTAL SHEETING WITH STRIP JOINT (SINGLE LAYER) / NON LOADBEARING



1. 9mm thick PROMATECT®-H board at each side of the partition.

2. 100mm x 9mm thick PROMATECT®-H cover strips, fixed to steel studs using 25mm long self-tapping screws at nominal 500mm centres.

3. Mineral wool:

- → One layer of 50mm x 60kg/m^3, 60mm x 40kg/m^3 or 80mm x 30kg/m^3 mineral wool for up to -/60/60 fire resistance.
- → One layer of 50mm x 150kg/m^3 or 75mm x 100kg/m^3 for up to -/120/120 fire resistance.
- → One layer of 75mm x 100kg/m^3 or 2 layers of 40mm + 30mm x 100kg/m^3 for up to -/240/120 fire resistance.

4. Galvanised steel studs, measurements in accordance with Studs Tables 1~2 on page 33 and 34 (allow appropriate expansion at top horizontal track, no allowance at this track for loadbearing purposes).

5. 32mm long self-tapping screws at nominal 200mm centres.

6. 40mm long M6 masonry anchors at nominal 500mm centres.

7. Caulk all perimeter gaps with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance and/or acoustic performance.

PROMATECT®-H SINGLE STEEL STUD PARTITION (DOUBLE SIDED DOUBLE LAYER) PH 22.24.3/ 22.36.1

Fire attack from both sides /
Non-loadbearing

Fire Resistance	**FRL**	-/240/240 -/360/360
	Standard	BS 476: Part 22: 1987 AS 1530: Part 4: 2005
	Approval	WF 164275, LPC TE6371A, EWA 23730-01
Acoustic	**STC** **R_w**	56 dB (-/240/240), 56 dB (-/360/360) 55 dB (-/240/240), 57 dB (-/360/360)
	Standard	ISO 140: Part 3: 1996 ISO 717: Part 1: 1996
	Predicted Assessment	Marshall Day, 18th October 2006
Construction	**Maximum Height**	12000 mm
	Maximum Length	Unlimited
	Partition Thickness	Nominal 136 mm (-/240/240) Nominal 148 mm (-/360/360)
	Partition Mass	From 53.04 kg/m² (-/240/240) From 67.11 kg/m² (-/360/360)

*Margin of error is generally within ±3 dB
*Details for walls above 3000 mm high are available on request

1. Two layers of PROMATECT®-H at both sides of steel studs, all joints should be staggered a minimum of 610 mm in both directions, thickness refer to table below

Fire resistance	Board thickness
-/240/240	9 mm board thickness
-/360/360	12 mm board thickness

2. Galvanised steel studs, measurements in accordance with Studs Tables 1–2 on page 33 and 34 (allow appropriate expansion at top horizontal track, no allowance at this track for loadbearing purposes). Refer to the table below for the distance between studs.

3. Mineral wool infill to the cavity between boards (see page 32 for different fire resistance requirements).

4. 25 mm long self-tapping screws at nominal 300 mm centres for the first layer board and 38 mm self-tapping screws at nominal 300 mm centres for the second layer board. Joints do not need to coincide with studs; joints in the second layer not coinciding with studs should be stitched to the first layer using 25 mm long laminating screws at nominal 300 mm centres.

5. 60 mm long M6 masonry anchors at nominal 500 mm centres.

6. Caulk all perimeter gaps with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance and/or acoustic performance.

VERTICAL SHEETING (DOUBLE LAYER) / NON LOADBEARING

1. Two layers of PROMATECT®-H at both sides of steel studs, all joints should be staggered minimum 610mm in both directions, thickness refer to table below.

Fire resistance	Board thickness	Mineral wool density x thickness
-/240/240	9 mm board thickness	100mm x 100kg/m³ or Two layers of 50mm x 100kg/m³
-/360/360	12 mm board thickness	50mm x 110kg/m³

2. Two layers of mineral wool, with the slab joints staggered minimum 300mm between layers in both directions. When the web dimension of the studs is increased, the thickness of the mineral wool must be similarly increased to fill the cavity. Alternatively, mineral wool of minimum 125mm x 80kg/m³ thick or minimum 150mm x 70kg/m³ thick may be used, refer to table above.

3. Galvanised steel studs, measurements in accordance with Studs Tables 1~2 on page 33 and 34 (allow appropriate expansion at top horizontal track, no allowance at this track for loadbearing purposes), refer to table below for the distance between stud.

4. 25mm long self-tapping screws at nominal 300mm centres for first layer board and 38mm long self-tapping screws at nominal 300mm centres for second layer board. Joints do need not to coincide with studs, joints in second layer not coinciding with studs stitched to first layer using 25mm long laminating screws at nominal 300mm centres.

5. Caulk all perimeter gaps with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance and/or acoustic perf

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