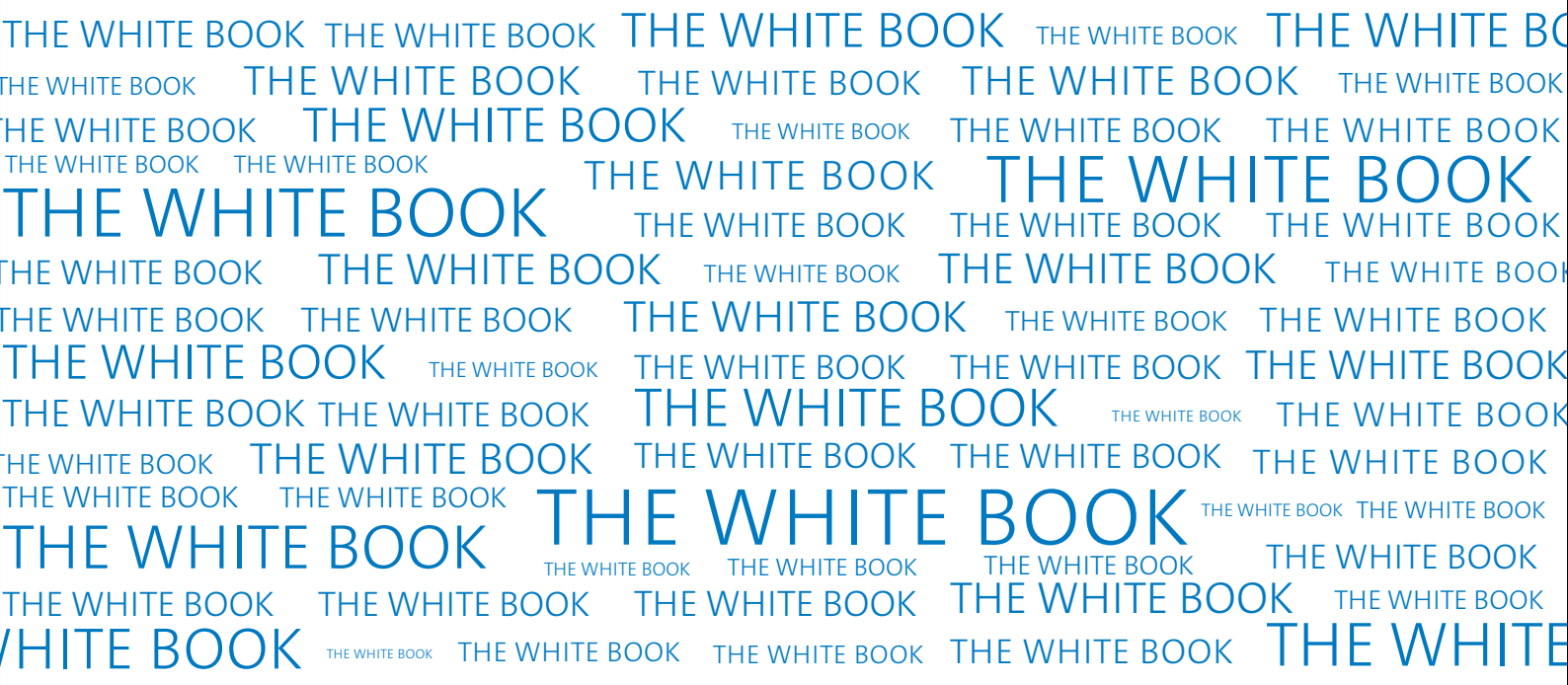


Gyproc
SAINT-GOBAIN

Welcome to 1st Edition of the Middle East WHITE BOOK from Gyproc

The WHITE BOOK, produced for over 35 years within the Saint-Gobain group in the United Kingdom, is revered as the technical aide to drylining. Now, for the first time Saint-Gobain Gyproc brings together the products and drylining systems that are relevant in the Middle East region.

The WHITE BOOK is your guide to a wide range of partition and lining solutions, specifications and products, as well as test substantiation data and installation details.

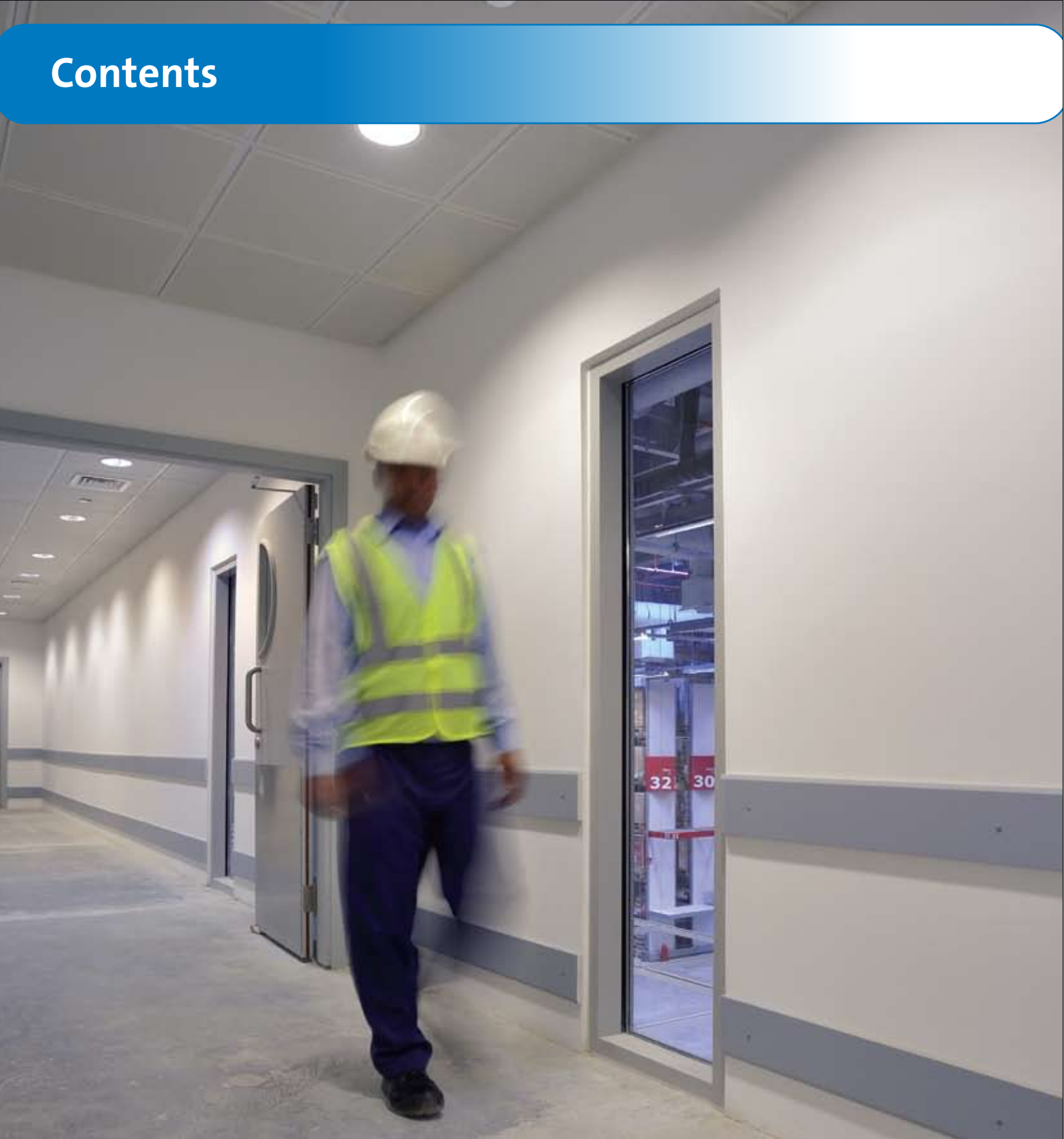
A few tips on how to get the most out of using the WHITE BOOK. If you are new to the publication, take a look at the how-to guide on page 4; it will help you find your way around.

At the front of the book, you will find a theory section focusing on the technical aspects of building. Basic principles provides information and technical guidance on design and construction of all building types with technical support provided by our Sales & Technical Team. It makes the WHITE BOOK so much more than a simple manufacturer's manual.

To make sure you can access the most up-to-date specification information, the new WHITE BOOK is also available to view or download at any time of the day or night, completely free of charge from www.gyproc .ae

We hope you find the WHITE BOOK a useful, reliable companion. If you need any further advice, please don't hesitate to contact the Gyproc Technical Team on +971 (0)4 450 2300 or our Customer Service Centre on +971 800 GYPROC (497762).

Contents

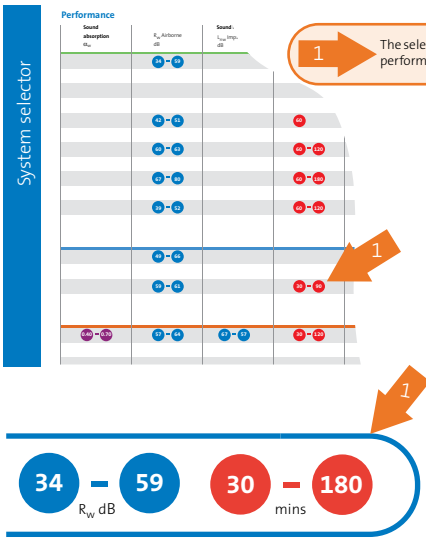


Contents

How to use this publication

Performance selector

When specifying a partition, floor or ceiling, performance characteristics normally determine the solution. The Gyproc system selector (pages 6 and 7) has been designed with this in mind. Simply select the performance categories of interest to easily identify the Gyproc systems that best satisfy the project requirements. A brief explanation of the categories are given below:



0.40 – 0.70 Sound absorption – α_w

Absorption rating used to describe the acoustic characteristics of a product. Useful in controlling reverberation for speech clarity, music renditions, and within communal areas of apartments.

34 – 59 Airborne sound insulation – R_w dB

Level of sound insulation afforded by a construction to adjacent areas in terms of airborne noise transmission, i.e. speech or music.

67 – 57 Impact sound insulation – L_{nw} dB

Level of sound insulation afforded by a construction to adjacent areas in terms of impact noise transmission, i.e. footfall or furniture movement.

30 – 180 Fire resistance – minutes

Fire performance test results to the relevant British (BS) standards.

▶ For further information on the above terms and other performance criteria, please refer to section - **Basic principles of system design.**

Applications and sectors

Due to the flexibility of Gyproc systems, they can be tailored to meet the requirements of a wide range of sectors and applications.

▶ Refer to System introduction pages.

2 Applications and sector descriptions as displayed in system introduction.

Selecting components

The system introduction pages give an overview of the components used within each Gyproc system. Not all components will be used in all specifications, as some products are interchangeable depending upon performance requirements.

▶ Refer to System introduction pages and system components pages.

An illustration of the component and a brief description of its use and / or physical properties is included in the listing.

▶ Refer to System components pages.

3 Indicative component locations within a constructed system.

Performance tables

Each performance table details the performance levels that each specification achieves. This includes the following, where appropriate:

- Fire resistance
- Partition and lining thickness
- Acoustic performance
- Maximum partition height
- Duty rating

Within each system, solutions are primarily sorted by fire performance, then by partition thickness, as shown in the example below:

▶ Refer to Performance pages.

4 Each specification has a number that corresponds with the plan view drawings located above each table.

5 Plan view drawings, located above each table, illustrate the composition of each specification.

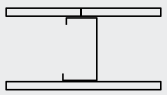
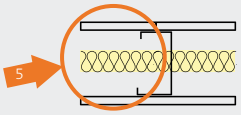
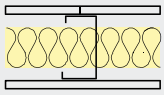
6 Fire resistance is the primary sort for solutions.

7 The fire resistance test standard that applies to performances quoted on the page. This will be British standard (BS).

8 Important notes, relating to the performances quoted in the table, are located at the bottom of each table.

9 Unique system references that can be quoted to Gyproc in order to obtain performance substantiation reports.

Table 2 – GypWall CLASSIC 70mm Gypframe 'C' Studs - single layer board linings Solutions to satisfy the requirements of BS 476: Part 22: 1987

1	2	3
		
One layer of board each side of 70mm Gypframe 'C' Studs at 600mm centres. Linings as in table.	One layer of board each side of 70mm Gypframe 'C' Studs at 600mm centres. 25mm Isover APR 1200 in the cavity. Linings as in table.	One layer of board each side of 70mm Gypframe 'C' Studs at 600mm centres. 50mm Isover APR 1200 in the cavity. Linings as in table.

for single layer Severe Duty solutions please refer to GypWall ROBUST

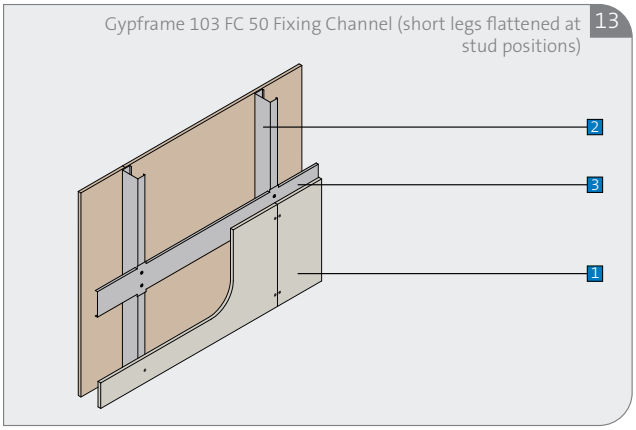
Detail	Partition thickness mm	Board type	Lining thickness mm	Maximum partition height[1] mm	Sound insulation Rw dB	Duty rating	Approx. weight kg/m²	System reference
6	30 minutes fire resistance (BS)							
1	97	Regular	1 x 12.5	3600	36	Medium	18	A206013
2	97	Regular	1 x 12.5	3600	42	Medium	18	A206045

1 Based on a limiting deflection of L/240 at 200 Pa. Greater heights can be achieved through the use of Gypframe 'I' Studs, or reduced stud centres. Refer to Principles of robust design.

9 NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

System design construction details

At the end of each system section, additional design information and construction detailing is included.



1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gyproc 103 FC 50 fixing channel

Products

Refer to the Products section, pages 176-199, for a listing of Gyproc components used in this publication.

Key
S/E - Square edge
T/E - Tapered edge

Included in the listings are product details such as dimensions, weights, finish details and other useful information.

Product Matrix

Width (mm)	Length (mm)*	Edge Type
9mm		
1200	2400	T/E
1200	3000	T/E
12.5mm		
1200	2400	T/E
1200	3000	T/E
15mm		
1200	2400	T/E
1200	3000	T/E

* other lengths available on request

System selector

Performance

Sound absorption α_w	R_w Airborne dB	Sound insulation L_{nw} Impact dB	Fire resistance minutes	Title
				6 Partition and wall systems
	34 – 59		30 – 180	GypWall CLASSIC
				GypWall CURVE
	42 – 51		60	GypWall ROBUST
	61 – 63		60 – 120	GypWall QUIET
	67 – 80		60 – 180	GypWall AUDIO
	39 – 52		60 – 120	ShaftWall
				7 Wall lining systems
	49 – 66			GypLyner UNIVERSAL
	59 – 61		30 – 90	GypLyner IWL
				8 Ceiling systems
0.40 – 0.75	57 – 64	67 – 57	30 – 120	Gyproc MF
				Gyproc MF CURVE
				GypLyner UNIVERSAL CEILING

Introduction

SpecSure

System Performance Future Proofed

Gyproc is a provider of superior quality products, for high performing systems, that are rigorously tested to internationally recognised standards.

Our systems withstand the robust demands of today's construction methods and building uses and provide comfortable living and working environments to the occupant.

We are confident our products will perform as intended. So confident we stamp it with Gyproc assurance. Our SpecSure system warranty is available on all complete Gyproc systems that consist of our comprehensive range of products.

SpecSure - guaranteeing the future of drywall.

The Gyproc Promise

SpecSure is your guarantee that the system you have chosen:

- Comprises only the highest quality components, designed to work individually and together to deliver the specified level of performance.
- Has the technical expertise and experience of the Middle East's leading drylining specialists behind it.
- Has been tested in the company's UKAS approved fire, acoustic and structural test laboratories.
- Has been site tested to demonstrate installation integrity and simplicity.
- Will be supported as required at every stage of the project by the Middle East's leading on and off-site technical support personnel.
- Will perform to published parameters once installed, to our recommendations.
- Will be replaced in the unlikely event of system failure attributed to; products manufactured outside published standards and system performance outside of published standards.

Project: Ferrari Experience, Abu Dhabi, UAE

The highest quality components

We know how important it is to you that the systems you choose provide the best possible solution for your project. **SpecSure** systems are designed using the highest quality components. Our products have been developed to work individually and together to deliver warranted performance systems you can rely on.

Plasterboard products

Gyproc plasterboard products have been manufactured within the Saint-Gobain group for more than 90 years, providing proven lining solutions that ensure Gyproc systems meet the fire, thermal, acoustic, moisture and impact performance demands of any building.

Metal products

Gypframe metal products provide the structural backbone of all Gyproc systems. The range of metal studs, channels, angles, brackets and associated components, designed using the unique UltraSteel™ process, is the widest and highest quality range of metal system components in the industry.

Ceiling products

Combining eye-catching design with stunning performance, Gyptone tiles and boards bring design back to performance ceilings - providing unique solutions for buildings, from schools to offices and hospitals to residential developments.

Accessories

To complete the range, Gyproc offers a comprehensive array of high quality accessories, comprising; Gyproc Jointing Compound, Gyproc Paper Tape and Gyproc Fibre Tape to ensure a seamless finish and Gyproc Drywall, Wafer Head and Jack Point Screws that provide secure fixings.

Project: Masdar Institute of Science and Technology, Abu Dhabi, UAE

Fire performance

Principles of fire performance

Fire growth
The choice of materials for walls and ceilings can significantly affect the spread of fire and its rate of growth, even though they are not likely to be the materials first ignited. The specification of linings is particularly important in circulation spaces where surfaces may offer the main means by which fire spreads, and where rapid spread is most likely to prevent occupants from escaping. Two properties of lining materials that influence fire spread are the rate of flame spread over the surface when it is subject to intense radiant heating, and the rate at which the lining material gives off heat when burning.

Compartmentation
The spread of fire within a building can be restricted by sub-dividing it into compartments separated from one another by walls and / or floors of fire resisting construction. Two key objectives are:

• To prevent rapid fire spread, which could trap occupants in the building.

• To reduce the chance of fires becoming large, which are more dangerous - not only to occupants and fire service personnel, but also to people in the vicinity of the building.

The appropriate degree of sub-division depends on:

• The use and fire loading of the building, which affects the potential for fires and their severity, as well as the ease of evacuation.

• The height to the floor of the top storey in the building, which is an indication of the ease of evacuation and the ability of the fire service to intervene effectively.

Structural fire precautions
Premature failure of the structure can be prevented by the provision for loadbearing elements to have a minimum period of fire resistance to failure of loadbearing capacity. The purpose in providing the structure with fire resistance is:

• To minimise the risk to the occupants, some of whom may have to remain in the building for some time (particularly if the building is a large one), while evacuation proceeds.

• To reduce the risk to fire fighters engaged on search and rescue operations.

• To reduce the danger to people in the vicinity of the building who may be hurt by falling debris, or because of the impact of the collapsing structure on other buildings.

Structural behaviour of steel in fire
Steel generally begins to lose strength at temperatures above 300°C and eventually melts at about 1500°C. Importantly for design, the greatest rate of strength loss is in the range of 400°C to 600°C.

Using international fire design codes, the load on the structure at the time of the fire can be calculated by treating it as an accidental limit state. If used, this will allow designers to specify to the fire protection contractor a limiting or failure temperature for a given structural section. The fire protection contractor will then be able to use the required thickness of material to ensure that the steel section does not exceed this temperature within the fire resistance period. This process could be simplified by the designer specifying a maximum steel temperature, based on the worst case, for all beams or columns on one floor level.

Buildings that are not primarily used for storage, e.g. offices, residential units, schools and hospitals, have a high percentage of non-permanent loads. For this type of building, some structural codes assume that a proportion of the design load will not be present at the time of the fire. Other types of buildings, such as warehouses and libraries, are primarily used for storage, so a high percentage of the load is permanent, and the codes allow for no reduction in design load for the fire condition.

The fire testing standards effectively base the failure criteria for loadbearing elements on strength. However, beams are often designed for deflection requirements, which mean that their strength is not fully utilised in the cold state and they would therefore have an additional reserve of strength at the fire limit state.

Columns are frequently designed so that a single length will be two or three storeys high. The lowest storey will be loaded the highest and the upper storey will be lightly loaded.

In buildings with a degree of non-permanent load (in terms of duration and magnitude), the load ratio of the structural members is unlikely to be greater than 0.6. In storage buildings, where the majority of load is permanent, the load ratio would normally be higher, but is unlikely to be greater than 0.65.

The thicknesses of protection required are specified for design temperatures of 550°C, unless otherwise stated. It is the responsibility of the design engineer, to specify the appropriate limiting steel temperatures.

The loss of strength of cold-formed steel at elevated temperatures exceeds that of hot-rolled steel by between 10% and 20%. Expert advice should be sought in determining the strength reduction factor at the limiting temperature.

British test standards

Fire resistance test standards

Fire resistance test – integrity testing on 3m high partition
Building Regulations and supporting documentation require elements of structure and other building elements to provide minimum periods of fire resistance, expressed in minutes, which are generally based on the occupancy and size of the building.

Fire resistance is defined in BS 476: Part 20: 1987 as 'the ability of an element of building construction to withstand exposure to a standard temperature / time and pressure regime without loss of its fire separating function or loadbearing function or both for a given time.

BS 476: Part 20: 1987
Describes the general procedures and equipment required to determine the fire resistance of elements of construction.

BS 476: Part 21: 1987
Describes the specific equipment and procedures for determining the fire resistance of loadbearing elements.

BS 476: Part 22: 1987
Describes the procedures for determining the fire resistance of non-loadbearing elements.

BS 476: Part 23: 1987
Describes the specific equipment and procedures for determining the contribution made by components to the fire resistance of structures.

Loadbearing capacity
A loadbearing element must support its test load. For floors, flat roofs and beams, allowable vertical deflection is limited to 1/20 of the clear span.

Integrity
A separating element must resist collapse, the occurrence of holes, gaps or fissures through which flames and hot gases could pass, and sustained flaming on the unexposed face.

Insulation
A separating element must restrict the temperature rise of the unexposed face to below specified levels.

Reaction to fire test standards Non-combustibility

Non-combustibility testing

To help provide maximum fire safety in buildings, certain building elements need to be constructed of non-combustible materials. A building material is designated as non-combustible if it satisfies performance criteria when tested in accordance with:

BS 476: Part 4: 1970 (1984) Non-combustibility test for materials.

BS 476: Part 11: 1982 (1988) Method for assessing the heat emission from building materials.

Glasroc F MULTIBOARD and Glasroc F FIRECASE are designated as non-combustible materials.

Fire performance

Principles of fire performance

Materials of limited combustibility

(a) Any non-combustible material (listed in AD B, Table A6).

(b) Any material of density 300kg/m³ or more, which does not flame or cause a 20°C temperature rise when tested to BS 476: Part 11.

(c) Any material with a non-combustible core at least 8mm thick having combustible facings (on one or both sides) not more than 0.5mm thick. Where a flame spread rating is specified, these materials must alsomeet the appropriate test requirements.

Gyproc plasterboards are all designated materials of limited combustibility.

Surface spread of flame

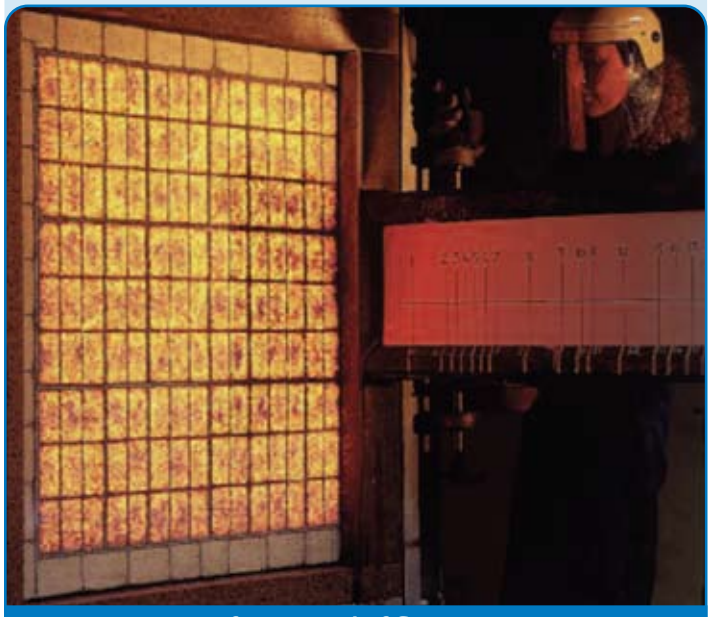
Flame spread over wall and ceiling surfaces is controlled by providing materials that are either non-combustible or materials of limited combustibility. Combustible materials (or certain materials of limited combustibility that are composite products) when tested to the standards below, are classified Class 1, 2, 3 or 4. Class 1 provides the greatest resistance to surface spread of flame.

BS 476: Part 7: 1997 Surface spread of flame tests for materials.

or

BS 476: Part 7: 1987 Method for the classification of the surface spread of flame of products.

The exposed plasterboard surfaces of Gyproc and Glasroc plasterboards are all designated Class 1.



Surface spread of flame test

American fire resistance test standard
Fire propagation

Investigations concerned with the growth of fires in buildings show that the surface spread of flame test does not measure all the properties that are relevant for placing combustible materials in the proper order of hazard. Such considerations led to the test which is described in BS 476: Part 6: 1989 Method of test for fire propagation for products. This test takes into account the amount and rate of heat evolved by a specimen whilst subjected to a specified heating regime in a small furnace. The standard describes the method of calculating the results to obtain indices of performance, which help to determine the suitability of combustible wall and ceiling lining materials when used in areas requiring maximum safety.

Class 0

In addition to the degree to which combustible materials used as wall and ceiling linings can contribute to the spread of flame over their surfaces, consideration must also be given to the amount and rate of heat evolved by these materials when used in areas requiring maximum safety. Designers may choose to make provisions that wall and ceiling surfaces must be Class 0 in circulation spaces (which are often escape routes) and in other specific situations. In AD B, a Class 0 material is defined as either:

(a) composed throughout of materials of limited combustibility (this term includes non-combustible materials)

or

(b) a Class 1 material that has a fire propagation index (I) of not more than 12 and a sub-index (i_1) of not more than 6.

The exposed surfaces of Gyproc and Glasroc plasterboards are designated Class 0 in accordance with AD B.

Although Class 0 is the highest performance classification for lining materials, it is not a classification identified in any British Standard.

American test standards

For information on American fire resistance test standard ASTM E119 and American reaction to fire test standard ASTM E84 please contact the **Gyproc Technical Team on +971 (0)4 450 2300.**

Why gypsum is so effective in fire

Glass fibres within the core of a Glasroc F specialist board

Failure of 6m high partition

Fire resistance

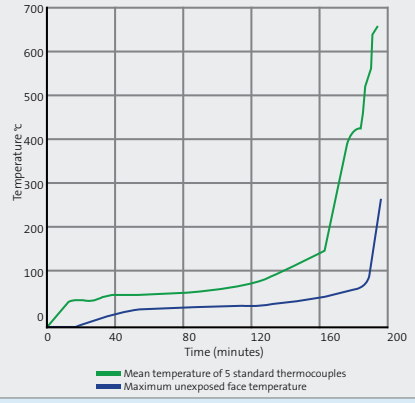
Gyproc and Glasroc plasterboards provide good fire protection due to the unique behaviour of gypsum in fire. When gypsum-protected building elements are exposed to fire, dehydration by heat (calcination) occurs at the exposed surface and proceeds gradually through the gypsum layer. Calcined gypsum on the exposed faces adheres tenaciously to uncalcined material, retarding further calcination which slows as the thickness of calcined material increases. While this continues, materials adjacent to the unexposed side will not exceed 100°C, below the temperature at which most materials will ignite, and far below the critical temperatures for structural components. Once the gypsum layer is fully calcined, the residue acts as an insulating layer while it remains intact.

Figure 1 - Temperature profile on the unexposed face of a partition system, shows a typical unexposed temperature profile for a plasterboard lined partition. The graph shows that there is a significant plateau in the temperature rise, while the plasterboard is undergoing calcination. After this period the temperature gradually rises until the boards lose their integrity and fall away.

The inclusion of glass fibres and shrinkage inhibitors within the gypsum core of certain plasterboards improves the cohesive properties and fire integrity performance. This enables a much higher fire protection performance to be achieved compared to Gyproc Regular board.

In terms of reaction to fire, gypsum products are excellent performers as the endothermic hydration reaction requires energy to be taken from the fire, so gypsum is a negative calorific contributor.

1 Temperature profile on the unexposed face of a partition system



Fire performance

Useful reference documents covering international legislation and guidance

Fire Safety - Building Regulations
UK Building Regulations Approved Document B (AD B) is one of a series of documents approved by the Secretary of State as practical guidance on meeting the requirements of Schedule 1 and Regulation 7 of Building Regulations 2000 (England and Wales). AD B Volume 1 covers dwelling houses and AD B Volume 2 covers buildings other than dwelling houses.

The documents classify the use of a building into purpose groups and specify minimum periods of fire resistance to be achieved by the building elements. The periods of fire resistance vary according to the use and the size of building. The greater the fire hazard a building presents then the greater the period of fire resistance required to protect the elements within the building. The materials used to form the internal surfaces of the building are also controlled to reduce the risk of fire growth and internal fire spread.

Healthcare Buildings - HTM 05 Firecode
Hospitals and healthcare environments, by their very nature, contain people who are at risk from fire. The recommendations given in the suite of HTM 05 Firecode (UK) includes internal fire spread, elements of structure, compartmentation, fire hazard areas, hospital streets, penetrations, protected shafts, ceiling membranes, cavity barriers and fire-stopping.

Educational Buildings - Building Bulletin 100 (BB100)
In the UK the design of fire safety in schools is covered by BB100.

Fire Protection for Structural Steel in buildings, ASFP Yellow Book
A UK publication prepared by the members of the Association for Specialist Fire Protection (ASFP). Presents the theory behind, and methods for, fire protection of structural steelwork. It provides a comprehensive guide to proprietary materials and systems.

Principles of building acoustics

Building acoustics is the science of controlling noise in buildings, including the minimisation of noise transmission from one space to another and the control of noise levels and characteristics within a space.

Noise can be defined as sound that is undesirable, but this can be subjective and depends on the reactions of the individual. When a noise is troublesome, it can reduce comfort and efficiency. If a person is subjected to noise for long periods, it can result in physical discomfort or mental distress. In the domestic situation, a noisy neighbour can be one of the main problems experienced in attached housing. The best defence against noise is to ensure that proper precautions are taken at the design stage and during construction of the building. The correct acoustic climate must be provided in each space and noise transmission levels should be compatible with usage. Retrofitted remedial measures taken after occupation can be expensive and inconvenient.

Ideally, the sound insulation requirements of the building should take into account both internal and external sound transmission. The term 'building acoustics' embraces sound insulation and sound absorption. These two functions are distinct and should not be confused. See - **Sound absorption.**

Sound insulation
Sound insulation is the term describing the reduction of sound that passes between two spaces separated by a dividing element. In transmitting between two spaces, the sound energy may pass through the dividing element (direct transmission) and through the surrounding structure (indirect or flanking transmission). In designing for sound insulation, it is important to consider both methods of transmission. The walls or floors, which flank the dividing element, constitute the main paths for flanking transmission, but this can also occur at windows, heating or ventilation ducts, doorways, etc.

The acoustic environment of the room and/or the building and the ability to reduce or eliminate air paths in the vicinity of the sound reducing element, e.g. doorsets, glazing, suspended ceiling cavities, ductwork, etc, will have a significant effect on its performance. For these reasons it is unlikely that figures quoted from laboratory test conditions will be achieved in practice. When the background noise is low, consideration may have to be given to a superior standard of sound insulation performance in conjunction with the adjoining flanking conditions. In any existing sound insulation problem, it is essential to identify the weakest parts of the composite construction.

Indirect paths (flanking transmission)
Flanking sound is defined as sound from a source room that is not transmitted via the separating building element. It is transmitted indirectly via paths such as windows, external walls and internal corridors. See **Figure 2 - Common flanking paths.**

It is imperative that flanking transmission is considered at the design stage and construction detailing is specified so as to eliminate or at least to minimise any downgrading of the acoustic performance. The sound insulation values quoted in system performance tables are laboratory values and the practicalities of construction will mean that acoustic performances measured in the laboratory will be difficult to achieve on site.

One of the main reasons for this difference is the loss of acoustic performance via flanking transmission paths. Good detailing at the design stage will minimise this effect and optimise the overall levels of acoustic privacy achieved.

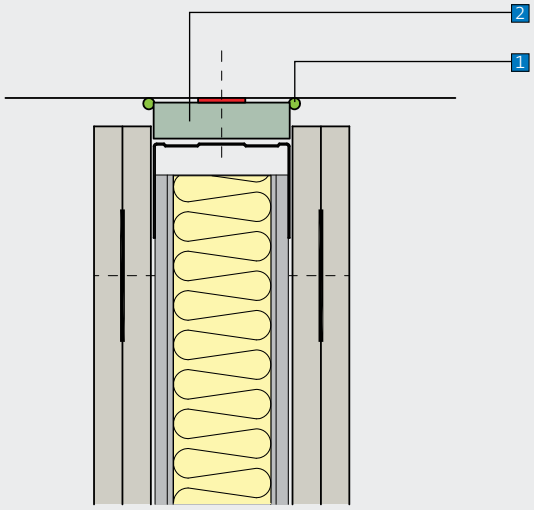
If designing for residential units, design advice on flanking details must be followed to maximise the possibility of achieving the specified acoustic performance. It is imperative that the design advice is followed, other wise site sound insulation values may not meet the performance criteria required and expensive remedial treatment may be required.

Small openings such as gaps, cracks or holes will conduct airborne sounds and can significantly reduce the sound insulation of a construction. For optimum sound insulation a construction must be airtight. Most small gaps can be sealed at the finishing stage using Gyproc jointing compounds. Small gaps or air paths around perimeter Gypframe framework can be sealed with sealant. At the base of the partition, gaps will occur, particularly when boards are lifted tight to the ceiling.

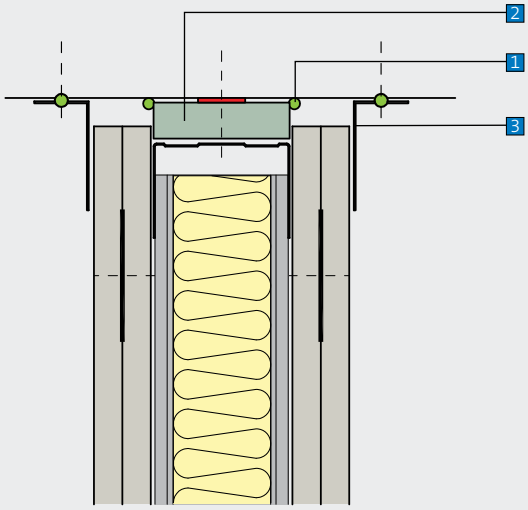
Deflection head details – acoustic performance
Deflection heads, by definition, must be able to move and, therefore, achieving an airtight seal is very difficult without incorporating sophisticated components and techniques. Air leakage at the partition heads will have a detrimental effect on acoustic performance of any partition. The approach shown in **Figure 3 - Deflection Head A** could, for example, result in a loss of around 4 dB to 5 dB due to air leakage, in addition to that lost due to flanking transmission, etc.

2 Common flanking paths

3 Deflection Head A (subject to fire performance)



4 Deflection Head B (subject to fire performance)



1 Sealant for optimum sound insulation
2 Gyproc CoreBoard forming fire-stop

3 Steel angle to minimise loss of sound insulation performance due to air leakage

Where acoustic performance is a key consideration, steps can be taken to minimise this loss of performance. **Figure 4 - Deflection Head B** shows the generally accepted method of achieving this and, provided that care is taken to ensure a tight fit between cloaking angle and lining board surface, the loss in performance can be significantly reduced. A loss in performance of around 1 dB up to 2 dB would be typical with this method. Other factors, such as flanking transmission through the structural soffit, can significantly affect the overall level of sound insulation. Therefore, to optimise sound insulation performance, other measures may need to be taken.

A suspended ceiling installed on both sides of the partition may provide a similar cloaking effect to that of steel angles. **Gyproc MF** incorporating imperforate plasterboard can deliver a similar reduction in air leakage at the partition head. A tight fit between the ceiling perimeter and the surface of the partition lining board is important, although mechanically fixed perimeters are not essential. Ceilings with recessed light fittings may be less effective and if these cannot be sealed in some way, the installation of cloaking angles at the partition head should be considered. A suspended ceiling may also reduce the level of sound flanking transmission via the soffit. Where perforated ceilings are used, e.g. Gyptone, the angles as shown in **Figure 4** are recommended. However, if the distance between the ceiling and the deflection head is greater than 200mm and the ceiling plenum contained Isover insulation (minimum 25mm), then the angles may not be required.

Sound by-passing a partition via the void above a suspended ceiling

This is a common source of sound transmission particularly where the ceiling is porous to sound. Where sound insulation is important, partitions should, wherever possible, continue through the ceiling to the structural soffit and be sealed at the perimeter junctions. Sound can easily travel through a perforated tile or lightweight suspended ceiling and over the top of a partition where it abuts the underside of the suspended ceiling. Gyproc plasterboard suspended ceilings offer better insulation where partitions must stop at ceiling level to provide a continuous plenum, and in this instance an option is to include a cavity barrier above the ceiling line.

Figure 5a-5d - Performance of typical ceiling/partition junctions shows the stages of sound insulation improvement for typical ceiling/high performance partition junctions. The best result is achieved by running the partition through to the structural soffits.

Composite construction

A common mistake made when designing a building is to specify a high performance element and then incorporate a lower performing element within it, e.g. a door within a partition. Where the difference between sound insulation is relatively small (7 dB or less) there needs to be a comparatively large area of the lower performing element, eg. door, before the overall sound insulation is significantly affected. A greater difference in sound insulation between the two elements normally results in a greater reduction of overall sound insulation performance.

Figure 6 - Composite calculation chart can be used to calculate the net mean sound insulation of composite partitions, e.g. a window in a partition. The correct mean sound insulation value for each part of the partition must be known in order to calculate the difference. This difference, read off on the curved line against the appropriate ratios on the vertical scale, gives the loss of insulation in dB on the horizontal scale. This figure is subtracted from the value of the part with the higher resistance to obtain the net sound insulation of the partition. **Figure 6** may also be used to assess the effect of gaps or holes in a partition by giving a sound insulation value of 0 dB to the aperture.

Example

Difference between insulation values of 30 dB with ratio of areas (vertical scale) equal to 1:4. Loss of insulation (horizontal scale) = 23 dB. Therefore, if the two parts had mean sound insulation values of 15 dB and 45 dB respectively, the net sound insulation of the partition would be only 22 dB, i.e. 45 dB - 23 dB = 22 dB.

Table 1 shows the acoustic effect on a range of partitions when various types of door are installed. It can be seen that if a poor performance door is included in a partition, it does not matter if the wall achieves 25 dB or 50 dB sound insulation as the net performance will never be better than 27 dB. The lowest performing element will always dominate the overall performance.

Table 1 - Effect of including various doortypes within a partition system

Door construction	Mean sound insulation of partition alone (dB)					
	25	30	35	40	45	50
	Mean sound insulation of partition with doorways accounting for 7% of area (dB)					
Any door with large gaps around the edge	23	25	27	27	27	27
Light door with edge sealing	24	28	30	32	32	32
Heavy door with edge sealing	25	29	33	35	37	37
Double doors with a sound lock	25	30	35	40	44	49

Acoustic privacy

Two main factors affect the level of acoustic privacy achieved when designing a building:

• The sound insulation performance of the structure separating the two spaces.

• The ambient background noise present within the listening room.

The ambient background noise level can be a useful tool when designing buildings, as it is possible to mask speech from an adjacent space and hence provide enhanced speech confidentiality. There are a number of commercially available systems for achieving this and the technique is referred to as acoustic perfume. It is, however, more common to treat the problem by specifying appropriate levels of sound insulation. A guide to sound insulation levels is given in **Table 2**.

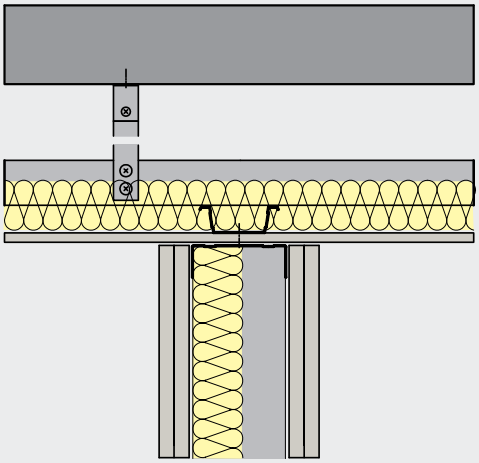
Table 2 - Guide to sound insulation levels for speech privacy

Sound insulation between rooms R_w	Speech privacy
25 dB	Normal speech can be overheard
30 dB	Loud speech can be heard clearly
35 dB	Loud speech can be distinguished under normal conditions
40 dB	Loud speech can be heard but not distinguished
45 dB	Loud speech can be heard faintly but not distinguished
> 50 dB	Loud speech can only be heard with great difficulty

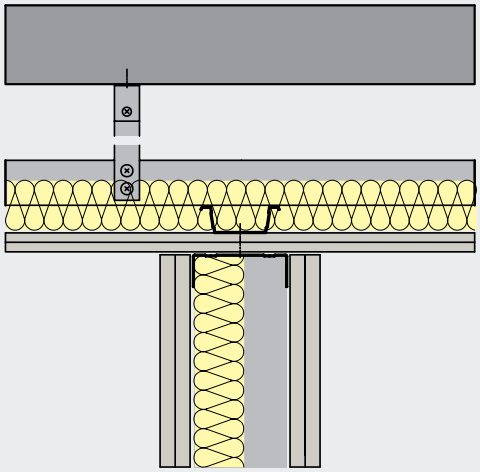
Specialist advice on acoustic privacy issues specifically for healthcare and educational environments can also be provided by contacting the Gyproc Technical Team. When designing for residential purposes, the standards of sound insulation given in **Table 2** are not adequate for separating walls as other sources of generated sound are often evident.

Typical performance (D_{ncw}) of typical celling / partition junctions

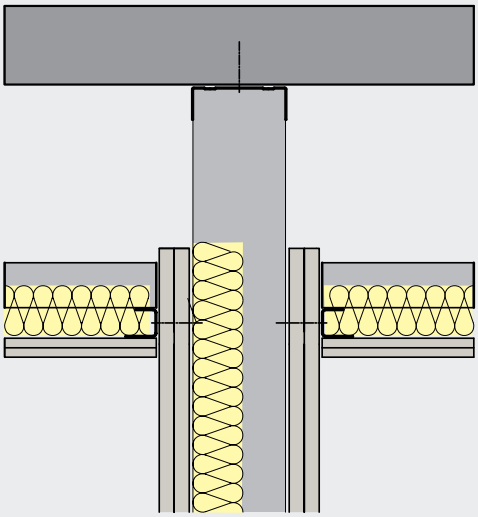
5a Concealed grid - lined with a single layer of plasterboard and overlaid with insulation = 48 dB



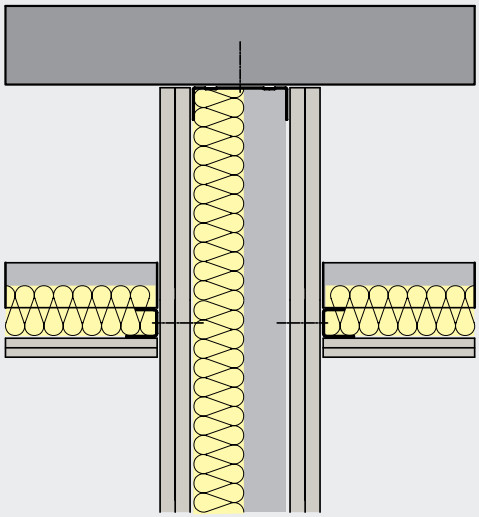
5b Concealed grid - lined with a double layer of plasterboard and overlaid with insulation = 49 dB



5c Concealed grid lined with a double layer of plasterboard within each room and overlaid with insulation = 56 dB



5d Partition lining continued to the soffit enabling the full potential of the partition to be achieved = 58 dB



Ambient noise levels

Along with acoustic privacy, the level of sound energy acceptable within a room should be assessed as regards intrusive noise levels and the level of potential noise likely to be generated within the room itself. For this purpose there are a number of methods, including the Noise Rating (NR) system. This rating quantifies the level of noise present within a space taking into account break-in of noise from the adjacent areas and also the background noise present within the space from ventilation or other building services. **Table 3** gives the recommended maximum noise within different activity spaces using NR criteria.

Table 3 - Recommended maximum noise rating for various types of room function

Situation	NR criteria (dB)
Sound studios	15
Concert halls, large theatres, opera houses	20
Large auditoria, large conference rooms, TV studios, hospital wards, private bedrooms, music practice rooms	25
Libraries, hotel rooms, countrooms, cinemas, medium-sized conference rooms	30
Classrooms, small conference rooms, open-plan offices, restaurants, public rooms, operating theatres, nightclubs	35
Sports halls, swimming pools, cafeteria, large shops, circulation areas	40
Workshops, commercial kitchens, factory interiors	45

The factors that affect the ambient noise level of a space are:

- The level of external noise.
- The level of sound insulation designed into the surrounding structure.
- The amount and type of sound absorbing surfaces within the room.
- The noise generated by building services.

Where control of ambient noise is critical, advice should be sought from an acoustic consultant.

Sound insulation – rating methods

The sound insulation rating methods that follow are defined in:

BS EN ISO 717: Part 1: 1997 (airborne)
and
BS EN ISO 717: Part 2: 1997 (impact)

R_W

This single figure rating method is the rating used for laboratory airborne sound insulation tests. The figure indicates the amount of sound energy being stopped by a separating building element when tested in isolation in the absence of any flanking paths.

D_{nTw}

The single figure rating method that gives the airborne sound insulation performance between two adjacent rooms within a building as measured on site. The result achieved is affected not only by the separating element but also by the surrounding structure and junction details.

Ctr

The Ctr adaptation term is a correction that can be added to either the R_W (laboratory) or D_{nTw} (site) airborne rating. The Ctr term is used because it targets the low frequency performance of a building element and in particular the performance achieved in the 100 - 315 Hz frequency range. This term was originally developed to describe how a building element would perform if subject to excessive low frequency sound sources, such as traffic and railway noise. Some of the performance tables in this book present relevant sound insulation values both in R_W terms but also in the Ctr adapted form. This rating is expressed as R_W + Ctr and allows the acoustic designer to critically compare performances. The rating method has not been universally welcomed. Some acousticians believe that the method is too crude as it only considers the low frequency performance, and because site measurements at low frequencies are prone to difficulties, which can lead to a lack of confidence in the results achieved.
Consequently, within separating constructions, Gyproc can offer enhanced specifications that meet the low frequency performance of the Ctr rating whilst also offering good mid and high frequency sound insulation.

L_{nw}

This single figure rating method is the rating used for laboratory impact sound insulation tests on separating floors. The figure indicates the amount of sound energy being transmitted through the floor tested in isolation, in the absence of any flanking paths. With impact sound insulation, the lower the figure the better the performance.

L_{nw}

The single figure rating method that is used for impact sound insulation tests for floors. The figure indicates the sound insulation performance between two adjacent rooms within a building as measured on site. The result achieved is affected not only by the separating floor but also by the surrounding structure, e.g. flanking walls and associated junction details.

D_{ncw}

The single figure laboratory rating method that is used for evaluating the airborne sound insulation performance of suspended ceilings. Laboratory tests simulate the room-to-room performance of the suspended ceiling when a partition is built up to the underside of the ceiling with sound transmitted via the plenum.

Lightweight construction

Typically the average sound insulation of a material forming a solid partition is governed by its mass. The heavier the material, the greater its resistance to sound transmission. To increase the sound insulation of a solid partition by about 4dB, the mass must be doubled. This is known as the empirical mass law. For example, a 100mm solid block wall of average mass 100kg/m² will have an approximate R_W value of 40 dB, whereas a 200mm solid wall of the same material would have an R_W value of 44 dB. Increasing mass is a very inefficient way of achieving sound insulation and one of the advantages of using lightweight cavity partitions and walls is that better than predicted sound reduction values can be achieved.

Figure 7 - Lightweight systems versus the mass law shows how lightweight systems consistently exceed mass law predictions. This demonstrates that adding mass is not always the best method when satisfying acoustic design requirements and that lightweight systems, if correctly designed, can provide very effective acoustic solutions. A simple stud partition, for example, can have an R_W rating 6dB better than predicted by the mass law. In this case, the maximum sound insulation obtainable will be governed by transmission energy through the stud frame. The use of other frame types and/or configurations can result in even better insulation by minimising the frame energy transmission to achieve results significantly better than the mass law prediction.

For example, the use of two completely separate stud frames can produce even better results. In this case, the maximum transmission of energy is through the cavity between the plasterboard linings. The air in the cavity can be considered as a spring connecting the linings.

which allows the passage of energy. The spring will have some inherent damping, which can be significantly increased by the introduction of a sound absorbing material, such as mineral wool, positioned in the cavity. The increased damping of the air-spring results in a reduced coupling between the plasterboard linings and a consequent decrease in sound transmission. Air-spring coupling becomes less significant as the cavity width increases. In practice, cavities should be as wide as possible to insulate against low frequency sounds.

Two important effects, resonance and coincidence, occur in partitions and walls. These are governed by such physical properties as density, thickness and bending stiffness, whereby a reduction in sound insulation occurs at certain frequencies. In lightweight cavity constructions these effects can be decreased by the use of two or more board layers. A simple way of increasing the sound insulation performance of a single layer metal stud partition is, therefore, to add an additional layer of plasterboard to one or both sides. This will increase the sound insulation performance by approximately 6 dB or 10 dB respectively.

Designing for on-site performance
D_{nTw} and Ctr

The Ctr rating method puts increased emphasis on the low frequency region of the spectrum. For lightweight construction this means a significant change in some of the design principles. For partitions the cavity should be as large as possible and double layers of plasterboard should be used.

For masonry walls lined with lightweight panels, cavities with a depth less than 60mm should be avoided. Under no circumstances should two linings with matched small cavities either side of a central panel be specified. These cavities can interact and cause a significant downgrade in the critical low frequency zone. If a small cavity needs to be used, then one side only should be lined with a double layer of plasterboard. Optimum performance is achieved by lining one side only and having a cavity depth of at least 85mm. See **Figure 8 - Optimum design of panel linings for Ctr.**

To increase the sound insulation of new or existing masonry walls, **GypLyner** systems can be used in conjunction with Isover insulation and the metal framing should be lined with plasterboard. The cavity depth for the **GypLyner** lining should be as large as possible, and small matched cavities either side of the wall should always be avoided.

For lightweight separating floors it may be necessary to have an imperforate plasterboard ceiling that is partially de-coupled from the floor structure, e.g. **Gyproc** MF Ceiling system.

Inappropriate detailing of flanking conditions can greatly reduce the level of performance of the system from that achieved in the laboratory. For separating wall and floor constructions to be fully effective, care must be taken to correctly detail the junctions between the separating wall or floor and associated elements such as external walls, other separating elements and penetrations or door openings, etc. If junctions are incorrectly detailed then the acoustic performance will be limited and the required performance criteria may not be achieved in practice. For good practice detailing, please refer to the construction details sections from the relevant system sections within this book, available to download from www.gyproc.ae.

On site testing may expose poor flanking details and inadequate separating wall and floor specifications. Therefore good flanking detailing and specifications that provide a reasonable margin of safety on site are essential.

A method of predicting the site D_{nTw} + Ctr performance achievable from a system is to refer to a laboratory R_W + Ctr rating. When looking at the difference between R_W + Ctr and D_{nTw} + Ctr, a minimum drop of 5 dB is typical depending on the wall specification, however Gyproc recommend that a safety margin of + 9 dB should be built in to reduce the risk of failure through on site workmanship and/or poor detailing.

D_{nTw}
Similar to D_{nTw} + Ctr, a realistic safety margin should be incorporated to reduce the risk of failure. Gyproc recommend a safety margin of + 7 dB when comparing site performance (D_{nTw}) to laboratory performance (R_W). For example, to comply with a requirement of D_{nTw} 56 dB, a system capable of achieving R_W 63dB under laboratory conditions should be specified.

$L_{nT,w}$
A minimum drop of 5 dB is typical when comparing site performance ($L_{nT,w}$) to laboratory performance (Lnw). When designing separating floors, an improved performance is achieved when decoupling of the walking surface from the structural floor slab is implemented, when normally a resilient layer of Ethafoam/neoprene or similar gasket is laid below an upper sand and cement screed. In addition to a de-coupling of the ceiling, e.g. **Gyproc MF** ceiling, a much reduced risk of impact sound flanking transmission into and down the flanking walls and surrounding structure is now achieved.

Examples of practical solutions

GypWall QUIET and GypWall AUDIO
The most acoustically effective wall designs are twin frame walls. Minimal or no bridging between the plasterboard linings and the increased cavity size allows optimum performance from the wall. **Figure 9 - Acoustic benefits of twin stud framework** shows the difference achievable by using a twin framed wall approach, using systems such as **GypWall QUIET** or **GypWall AUDIO** as opposed to a standard single frame **GypWall CLASSIC** 'C' stud partition. The plasterboard linings and insulation are the same for both partitions and the key difference is the overall partition thickness - typically 211mm for the standard partition and 300mm for the twin framed option. With this type of design, further improvements in performance can be achieved by increasing the cavity size and/or increasing the board specification.

Sound insulating dry linings

In designing for sound insulation, care should be taken to ensure that flanking transmission via the associated structure does not downgrade the performance of the partition or wall to a level below that required in use. This applies especially when a Gyproc partition is constructed in a masonry building. Care should be taken to ensure that the abutting structure is able to achieve the level of sound insulation required when flanking another wall or partition. The performance of sound resisting concrete construction floors, supported on or flanked by conventionally finished masonry walls, can also be adversely affected. The effect of flanking transmission in the walls can be significantly reduced by the application of a GypLyner wall lining system to these flanking walls. Lining treatments can also be beneficial in refurbishment work when applied to flanking walls to a new or existing sound resisting wall.

Sound absorption

Sound absorption is the term given to the loss of sound energy on interaction with a surface. Sound absorbent surfaces are used to provide the correct acoustic environment within a room or space. The choice of material will be influenced by its acoustic efficiency, appearance and durability. By converting some of the sound energy into heat, sound absorbing materials will also help sound insulation because less noise will be transmitted to other rooms. However, this reduction in noise is very small when compared with the potential reduction due to sound insulation. Sound absorption is therefore never a substitute for adequate sound insulation.

Reverberant energy
Reverberation is the persistence of sound in a particular space after the original sound is removed. A reverberation, or reverb, is created when a sound is produced in an enclosed space causing a large number of echoes to build up and then slowly decay as the sound is absorbed by the walls, ceilings, floor and air. The length of this sound decay is known as reverberation time and can be controlled using sound absorbing materials. The appropriate reverberation time for a space will be dependent on the size and function of the space. Some typical reverberation times are given in **Table 4**.

Table 4 - Typical reverbertion times

Type of room / activity	Reverberation time (mid frequency)
Swimming pool	<2.0 seconds
Dance studio	<1.2 seconds
Large lecture theatre	<1.0 seconds
Small lecture room	<0.8 seconds
Primary school playroom	<0.6 seconds
Classroom for hearing impaired	<0.4 seconds

Speech clarity

Speech clarity (intelligibility) is now recognised as essential in helping pupils in an educational environment to achieve their full potential. For further information please contact the Gyproc Technical Team.

Research has shown that pupils who cannot understand clearly what the teacher is saying have a tendency to 'switch off' – limiting their own educational opportunities and creating additional stress for teachers. In a typical classroom with the teacher at one end, sound reaches the pupils both directly from the teacher and via reflections from the ceiling, walls and floor. Refer to Figure 10 - Sound transmission in a typical classroom. Pupils at the front will generally be able to understand what the teacher is saying, whilst pupils at the back and sides of the room receive a mixture of both direct speech and reflected sound, making it difficult to identify the teacher's words.

Reverberation time alone cannot be relied upon to deliver a suitable environment for good speech intelligibility. In any situation where speech communication is critical, e.g. conference room, lecture theatre or classroom, it is necessary to design the space appropriately using a mixture of sound reflective and sound absorbing surfaces.

Sound absorption rating methods

The following ratings are calculated in accordance with BS EN ISO 11654: 1997.

Sound Absorption Coefficient, α_s

Individual sound absorption figures quoted in third octave frequency bands are used within advanced modelling techniques to accurately predict the acoustic characteristics of a space. The coefficient ranges from 0 (total reflection) through to 1 (total absorption).

Practical Sound Absorption Coefficient, α_p

A convenient octave-based expression of the sound absorption coefficient, commonly used by acoustic consultants when performing calculations of reverberation times within a building space.

Sound Absorption Rating, α_w

A single figure rating used to describe the performance of a material. The single figure rating can have a modifier added to indicate if the spectral shape is dominated by a particular frequency range:

- L - absorption is predominantly in the low frequency region.
- M - absorption is predominantly in the mid frequency region.
- H - absorption is predominantly in the high frequency region.

The absence of a letter following the rating indicates that the absorber has no distinct area of sound absorption and has an essentially flat spectral shape. See **Figure 11 - Typical test data sheet for a sound absorption test.**

Sound absorption treatments are referenced within some international regulatory documents, such as Approved Document E and Building Bulletin 93 to control the noise levels generated within common areas of residential and educational buildings, e.g. entrance halls, lobbies, corridors, stairs and landings. AD E specifies sound absorption in terms of a class of absorber. The values ascribed to the different classes are given in **Table 5**.

Table 5 - Absorption classes

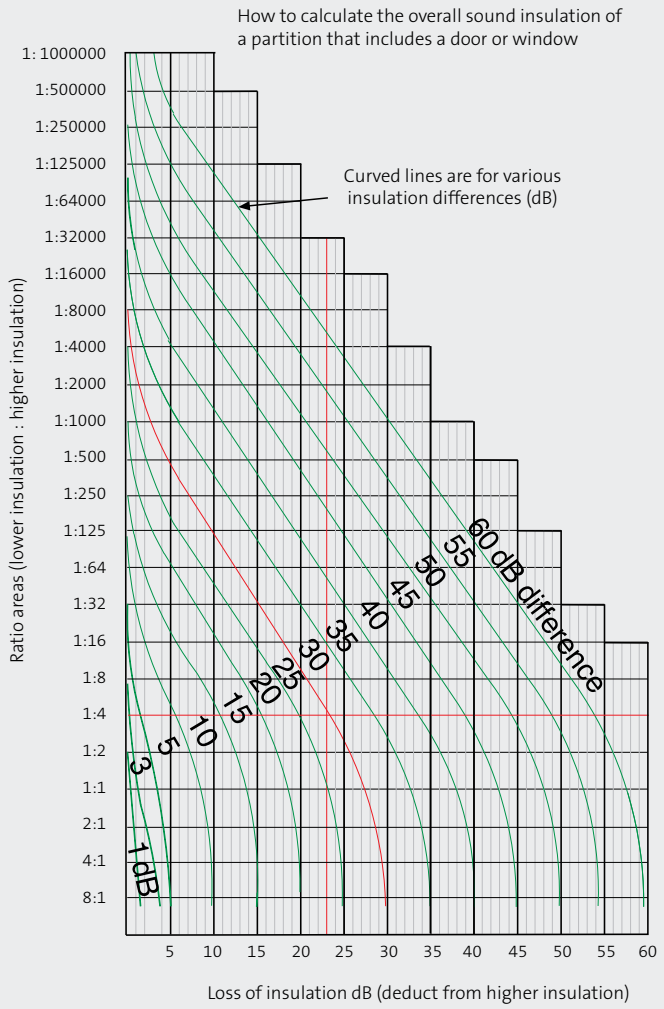
Sound absorption class	α_w
A	0.90, 0.95, 1.00
B	0.80, 0.85
C	0.60, 0.65, 0.70, 0.75
D	0.30, 0.35, 0.40, 0.45, 0.50, 0.55
E	0.15, 0.20, 0.25
Unclassified	0.00, 0.05, 0.10

Noise Reduction Coefficient, NRC

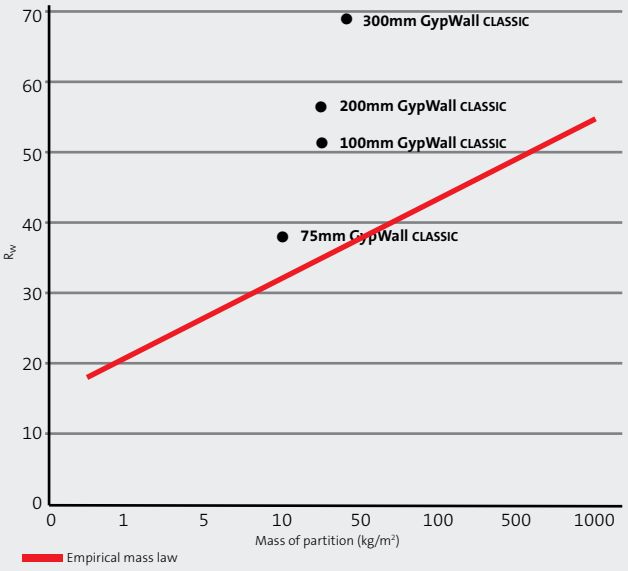
Whilst the sound absorption performance of a ceiling system can be expressed as an NRC, this does not always accurately reflect the product performance. An NRC value is the arithmetic mean of the absorption coefficients across a limited frequency range; this means that it will hide extremes in performance. For instance, a ceiling tile may be a very efficient absorber at high frequencies but very poor at low frequencies, and the NRC value will not reflect this. To optimise the room acoustics the more accurate Sound Absorption Rating α_w rating should be used.

Building acoustics

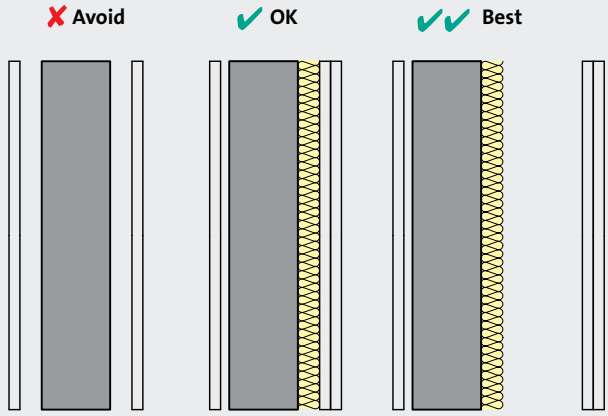
6 Composite calculation chart



7 Lightweight systems versus the mass law



8 Optimum design of panel linings for Ctr

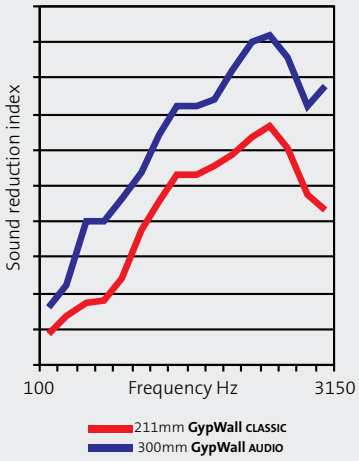


Matched cavities less than 60mm to be avoided

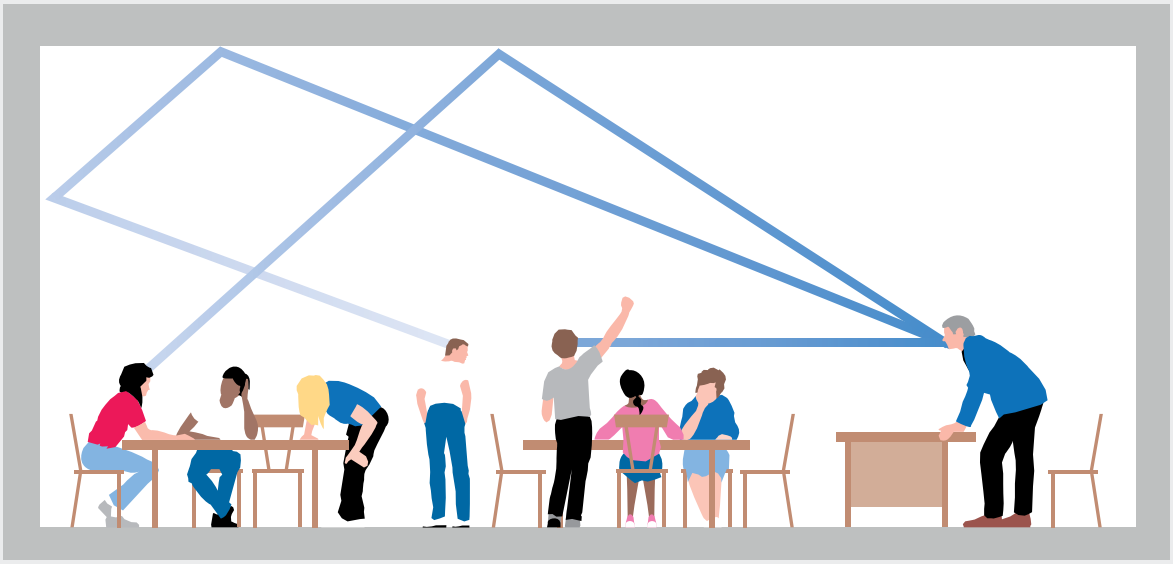
If space restrictions limit the cavity size then install one side only, ensure glass mineral wool is used in the cavity and use a double layer of plasterboard

Single cavity as large as possible (preferably greater than 85mm), lined with a double layer of plasterboard and glass mineral wool included in the cavity

9 Acoustic benefits of twin stud framework



10 Sound transmission in a typical classroom



11 Typical test data sheet for a sound absorption test

Test code: R13402AA

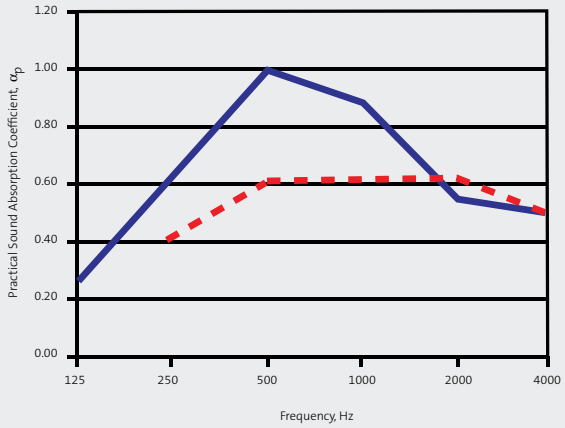
Freq. Hz	Ref. curve	Specimen
125		0.25
250	0.40	0.60
500	0.60	1.00
1000	0.60	0.90
2000	0.60	0.55
4000	0.50	0.50

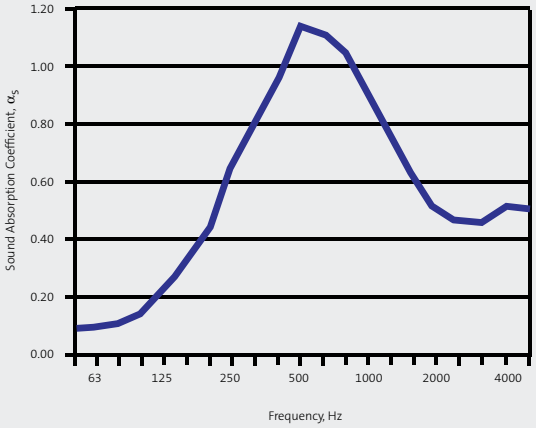
Rating and Sound absorption class according to

EN ISO 11654: 1997 α_w = 0.60 (M) Class = C

It is strongly recommended to use this single figure rating in combination with the complete sound absorption coefficient curve.

Freq. Hz	α_s
50	0.10
63	0.10
80	0.12
100	0.16
125	0.24
160	0.35
200	0.44
250	0.63
315	0.80
400	0.96
500	1.15
630	1.12
800	1.04
1,000	0.89
1,250	0.76
1,600	0.62
2,000	0.52
2,500	0.46
3,150	0.45
4,000	0.51
5,000	0.50
6,300	
8,000	
10,000	





Building acoustics

Useful reference documents covering international legislation and guidance

Building Regulations Approved Document E (ADE) – Residential Buildings
In the UK the national building regulations covering resistance to the passage of sound - AD E gives guidance on providing a reasonable level of sound insulation between dwellings and offers suggested forms of separating construction. These forms of construction do not, however, guarantee that the required performance level will be achieved in practice. Ultimately the developer needs to demonstrate that the dwelling, when built, meets the performance levels set by means of Pre-Completion Testing.

AD E sets performance levels for the following areas of a residential building:

• Separating walls between rooms used for residential purposes - ie hotel rooms, student accommodation or other temporary accommodation, and rooms created by a material change of use – ie refurbishment or renovation, must achieve a minimum D_{nTw} + Ctr = 43 dB

• Separating walls between new dwellings must achieve a minimum D_{nTw} + Ctr = 45 dB

• Separating floors between rooms formed by a material change of use must achieve a minimum D_{nTw} + Ctr = 43 dB and a maximum L_{nTw} = 64 dB

• Separating floors between new dwellings and within residential buildings must achieve a minimum D_{nTw} + Ctr = 45 dB and a maximum L_{nTw} = 62 dB

• An internal wall or floor between a bathroom or bedroom and any other room within the dwelling (with the exception of walls with doors) must achieve R_W = 40 dB

• The common area's – ie lobbies or reception area's of buildings that contain apartments or rooms for residential purposes should have an area equal to or greater than the floor area covered with a Class C absorber or better. An alternative calculation method is given with AD E.

• For stairwells or a stair enclosure in buildings containing apartments or rooms for residential purposes, an area equal to the surface area of the stair and landings, plus the ceiling area of the top floor, must be covered with an equal area of Class D absorber or alternatively 50% of the area must be covered with a Class C absorber or better.

Robust Details
To avoid Pre-Completion Testing for new-build houses and flats, the Home Builders Federation (HBF) in the UK developed a series of Robust Details. These forms of construction have been designed and site tested to ensure that they deliver a standard of sound insulation to meet the minimum requirements of AD E. Robust Details can be used as an alternative to Pre-Completion Testing. Further details are available from the Gyproc Technical Team and also from the Robust Details website www.robustdetails.com

BS 8233 - Sound insulation and noise reduction for buildings
Code of practice setting out acoustic ratings appropriate to a variety of different building types.

BB93 - Building Bulletin 93: Acoustic design of schools
Building Bulletin 93 contains acoustic design requirements for sound insulation between spaces, ambient noise levels and optimum reverberation times for various spaces within educational buildings. For more information contact the Gyproc Technical Team.

Health and Technical Memorandum HTM 08-01 Acoustics - Healthcare Buildings
HTM 08-01 contains a method of determining the level of sound insulation required between adjacent spaces in a healthcare environment. The document also gives recommended reverberation times for various types of space. For more information contact the Gyproc Technical Team.

Principles of building acoustics

Partition Duty ratings

All Gyproc partition systems have a duty rating established in accordance with all the full requirements of BS 5234. This rating relates the strength and robustness characteristics of the partition system against specific end-use applications. Table 6 gives details of the four duty categories.

Table 6 - Duty ratings

Partition Duty	Category	Examples
Light	Adjacent space only accessible to persons with high incentive to exercise care. Small chance of accident occuring or misuse.	Domestic accommodation
Medium	Adjacent space moderately used, primarily by persons with some incentive to exercise care. Some chance of accident occuring or misuse.	Office accommodation
Heavy	Adjacent space frequently used by the public and others with little incentive to exercise care. Chance of accident occuring or misuse.	Public circulation areas, industrial areas
Severe	Adjacent space intensively used by the public and others with little incentive to exercise care. Prone to vandalism and abnormally rough use.	Major circulation areas, heavy industrial areas

The series of tests are designed to test the resistance to damage, both aesthetic and structural, from a range of impacts and load applications.

Tests are conducted at the maximum height for the partition system. BS 5234 itself does not have a method for establishing an acceptable maximum height, and the partition height must be established using a separate method - see maximum partition heights later. It is suggested within BS 5234 that the crowd pressure test may be suitable for evaluating heights up to 4200mm, but Gyproc would strongly advise against using this inconsistent approach and would never rely solely on BS 5234 for evaluating heights, especially above 4200mm.

Tests within BS 5234 include:

- Partition stiffness
- Resistance to damage from a small hard body impactor
- Resistance to damage from a large soft body impactor
- Resistance to perforation from a small hard body impactor
- Resistance to structural damage from a large soft body impactor
- Resistance to damage from door slamming

BS 5234 does not identify specific points of contact on a partition that should be impacted. However, Gyproc understands there are limiting points in terms of impact resistance. These are then subjected to the impact tests to ensure that the most onerous situation are assessed.

Optional tests are also detailed within the standard, but these are not used in the partition grading. These include:

- Resistance to damage from a crowd pressure load
- Lightweight anchorages pull down
- Lightweight anchorages pull out
- Heavyweight anchorages wall cupboard
- Heavyweight anchorages wash basin

Refer to section **Service Installations,** for information on fixing to drywall systems.

Important considerations

To achieve Heavy Duty or Severe Duty, the door detail needs to be reinforced otherwise the door opening will undergo too much deflection and damage during the onerous door slamming test.

To claim a partition duty, all tests must achieve the designated performance level. It is not possible, for example, for a partition lined with a single layer of Gyproc Regular (12.5mm) to achieve a duty rating better than Medium, because of the board's performance in the hard body perforation test. In the majority of cases, the type of board used will determine the maximum partition duty rating. **Table 7** shows the maximum rating available based on a single layer board lining. In all cases, a double layer lining achieves Severe Duty.

Table 7 - Board type required to achieve a given duty rating

Board type	Maximum rating
Gyproc Regular 12.5mm	Medium
Gyproc Regular 15mm	Medium
Gyproc FireStop 12.5mm	Medium
Gyproc FireStop 15mm	Heavy
Gyproc DuraLine 15mm	Severe

The level of deflection and strength performance required to achieve Light Duty within BS 5234 is, in Gyproc's opinion, unsuitable for any application. Gyproc does not offer any systems with a rating less than Medium Duty.

Robustness

Maximum partition heights

As stated previously, BS 5234: Part 2 does not contain a consistent methodology. Gyproc has adopted the internationally accepted methodology for establishing the performance of a partition in terms of height, which is based on the level of lateral deflection under a given uniformly distributed load (UDL). The criterion is that the maximum lateral deflection of the partition should not exceed L/240 (where L is the partition height) when the partition is uniformly loaded to 200 Pascal's (Pa).

Gyproc utilises a UKAS accredited test laboratory to evaluate partition system heights against this performance criteria. The test evidence comes from a full-scale test procedure where the test specimen is subjected to a UDL and the induced lateral deflection recorded. From this procedure, it is possible to establish the maximum height for a range of partition systems. Please see **Table 8** for example using **GypWall CLASSIC**.

When cutting Gypframe studs to suit partition height, it is not good practice to cut the stud through the location of a service cut-out.

Table 8 - GypWall CLASSIC metal stud partition recommended maximum heights (mm) - based on a limiting deflection of L/240 at 200 Pa

Stud	Boarding each side	600mm centres	600mm boxed	400mm centres	400mm boxed	300mm centres	300mm boxed
50 S 50	1 x 12.5mm	2500	2800	2900	3200	3100	3500
	1 x 15mm	2800	3000	3100	3300	3300	3600
	2 x 12.5mm	3400	3600	3600	3800	3800	4000
	2 x 15mm	3700	3800	3900	4000	4000	4200
70 S 50	1 x 12.5mm	3600	3900	4000	4300	4300	4700
	1 x 15mm	3800	4100	4200	4500	4500	4900
	2 x 12.5mm	4600	4800	4900	5100	5100	5400
	2 x 15mm	4900	5100	5100	5300	5300	5600
70 I 70	1 x 12.5mm	4600	-	5100	-	5600	-
	1 x 15mm	4700	-	5300	-	5700	-
	2 x 12.5mm	5300	-	5700	-	6100	-
	2 x 15mm	5500	-	5900	-	6300	-
100 S 50	1 x 12.5mm	4500	4800	4900	5400	5300	5800
	1 x 15mm	4700	5000	5200	5600	5500	6000
	2 x 12.5mm	5700	5900	6000	6300	6200	6600
	2 x 15mm	5900	6100	6200	6500	6400	6800
100 I 80	1 x 12.5mm	6000	-	6800	-	7400	-
	1 x 15mm	6100	-	6900	-	7500	-
	2 x 12.5mm	6800	-	7400	-	7900	-
	2 x 15mm	6900	-	7500	-	8000	-
150 S 50	1 x 12.5mm	6200	6800	6900	7600	7500	8300
	1 x 15mm	6500	7000	7200	7800	7700	8400
	2 x 12.5mm	7600	8000	8100	8600	8500	9100
	2 x 15mm	7900	8200	8300	8800	8700	9300
150 I 90	1 x 12.5mm	8400	-	9500	-	10400	-
	1 x 15mm	8500	-	9600	-	10500	-
	2 x 12.5mm	9100	-	10100	-	10900	-
	2 x 15mm	9400	-	10300	-	11100	-

In all systems, for heights below 4200mm, the appropriate Gypframe Standard Floor & Ceiling Channel can be used. It is recommended that for heights between 4200mm and 8000mm, the Gypframe Deep Flange Floor & Ceiling Channel is used. Gypframe Extra Deep Flange Floor & Ceiling Channel is used for heights above 8000mm. Additional consideration needs to be given if there is a deflection head requirement.

Assessing acoustic performance of GypWall CLASSIC with reduced stud centres
Reducing the centres of the metal studs within GypWall partition systems can have a detrimental effect on the sound insulation performance of the system.
Gyproc has estimated the performance reductions for **GypWall CLASSIC**.

- When there is no insulation within the partition cavity and studs are closed down to 400mm centres, this results in an estimated 2 dB loss in R_W compared to studs at 600mm centres with no insulation.
- When there is no insulation within the partition cavity and studs are closed down to 300mm centres, this results in an estimated 3 dB loss in R_W compared to studs at 600mm centres with no insulation.
- When there is a minimum 25mm Isover insulation within the partition cavity and studs are closed down to 400mm centres, this results in an estimated 0 dB loss in R_W compared to studs at 600mm centres with 25mm Isover insulation.
- When there is a minimum 25mm Isover insulation within the partition cavity and studs are closed down to 300mm centres, this results in an estimated 2 dB loss in R_W compared to studs at 600mm centres with 25mm Isover insulation.

Robustness

Movement
Deflection of upper floor and roof slabs can cause appreciable stress in partitions. Where such deflection is likely to occur, the partition to structural soffit junction detail must be designed to accommodate movement, whilst still complying with any fire or acoustic performance requirements. Typical deflection head details for fire-rated GypWall partition systems are given in the relevant partition and wall system sections within this book. Additional attention to detailing will be required to optimise sound insulation performance. The deflection head details included in the **Building acoustics** section shows a good practice solution incorporating steel angles, either side of the head and sealed to the structure, which results in only a 1 dB up to 2 dB loss in performance.

Where partitions cross a movement joint in a structural floor or roof slab, they should be provided with a movement joint at the same point, and be capable of the same range of movement as the floor or roof joint. Various after market control joint beads are available to provide suitable solutions for the required movement.

Environmental conditions

Temperature
Gyproc and Glasroc plasterboards should not be used where the temperature will exceed 49°C. Prolonged exposure to high temperature, and / or multiple exposure for short periods, results in the gradual continued calcination of the gypsum and loss of its inherent properties. Gyproc and Glasroc plasterboards can however be subjected to freezing conditions without risk of damage.

Moisture
Gyproc plasterboards should not be used in continuously damp conditions nor in buildings that are not weathertight. However, Gyproc Moisture Resistant board, Gyproc FireStop MR, Gyproc DuraLine MR, Gyproc CoreBoard and Glasroc specialist boards are all suitable for use in intermittently damp conditions or sheltered external situations in conjunction with an appropriate decorative finish. This should take the form of ceramic tiling or other suitable moisture impervious coating by others.

Relative humidity (RH)
In moderate humidity situations, i.e. 40% to 70% RH, no special precautions need to be taken when using Gyproc plasterboards, other than those necessary to prevent interstitial condensation.

Low humidity does not affect the plasterboards, but may lead to distortion of any timber framing members that are used as support as they dry to below their usual moisture content.

Intermittently high relative humidity, i.e. above 70% RH, requires special treatment to the face of the plasterboards, and only moisture resistant grade plasterboards or Glasroc specialist boards should be used. Suitable surface treatments include ceramic tiling and water vapour resistant paint systems. Gyproc plasterboards are not considered suitable in continuously high humidity conditions.

Special environments - swimming pools and similar environments

Ceiling lining
Gyproc products and systems are regularly specified for ceilings in and around swimming pool halls and similar areas. With regard to ceiling specifications attention to detail is critical. The following guidance should be considered:

• The boards to be used should be moisture resistant grade or Glasroc specialist boards. They should be screw-fixed to a framed system at their recommended centres.

• The surface of the board should be finished using Gyproc's recommended methods, and they must be set and dry before applying decoration.

• The decoration should take the form of a suitable moisture impervious finish supplied by others.

• Penetrations in the ceiling linings and perimeters should be avoided where possible. All service penetrations must be sealed using a moisture resistant sealant (even though the recommended plasterboards are moisture resistant it is unwise to allow moisture to gain access to the core of the board).

• The air in the pool area should be conditioned such that condensation will not form on the surface of the boards.

• In situations where there is a risk of condensation occurring within the ceiling cavity, it must be mechanically ventilated or the decorative finish must be impervious to water vapour. This will minimise the risk of condensation forming on 'cold' surfaces in the cavity, which could then come in to contact with the unprotected back face of the plasterboard lining.

• It is good practice to protect the cut ends of Gypframe metal components using suitable material to prevent corrosion.

Wall lining
Gyproc boards (including MR grade) are not suitable for use as wall linings in areas such as communal showers and public pool halls. Moisture Resistant grade board and Glasroc F specialist boards can be considered for use in adjacent areas of wall lining and in most domestic situations but attention to detail is critical and, in addition to the guidance given above for ceiling linings, the following additional guidance should be considered.

• The lining boards must be lifted clear from any floor where free water is possible and a suitable skirting detail must be employed which will not allow water penetration

• Important guidance is given within BS 5385-1: 2009 and BS 5385-4: 2009, within which gypsum plasterboard and gypsum plaster are deemed unsuitable backgrounds for tiling in 'frequently wetted' areas. 'Frequently wetted' areas include communal showers and pool halls.

Ceilings - general
EN 13964: 2004 includes class definition relating to exposure conditions and maximum deflection. The standard **Gyproc MF** ceiling lay-out is capable of complying with deflection class 2 and exposure class A, however the system can be modified to meet classes 1 and B. Contact the Gyproc Technical Team for further guidance.

Useful reference documents covering international legislation and guidance

BS 5234: Part 2: 1992 - Partition Grading
BS 5234 comprises two parts - Part 1 Code of practice for the design and installation, and Part 2 Specification for performance requirements for strength and robustness including methods of test in relation to end-use categories. The standard covers performance aspects such as stiffness, crowd pressure, impact resistance, anchorages and door slamming resistance.

HTM 60 - Ceilings in Healthcare Environments
HTM 60 sets out six performance categories. These categories relate user requirements to the physical and performance characteristics of different ceilings.

BS EN 13964: 2004 - Suspended Ceiling - Requirements and test methods
Includes performance requirements for ceiling tiles and suspended ceiling grid systems (concealed and exposed). The standard covers issues such as the load span performance of grids.

Services installations

Services with partitions and lining cavities

Services can be incorporated in all Gyproc lining systems, partitions and ceilings.

Gypframe stud framing has the benefit of 'H' shaped cut-outs, 70 x 27mm at the centres shown in **Figure 16 - Gypframe studs service cut-out details.** These service cut-outs are used to accommodate routing of electrical and other services within the partition cavity. Grommets or isolating strip can be installed in the push-out to provide additional prevention against abrasion of the cables if required. Switch boxes and socket outlets can be supported on brackets formed from Gypframe 103 FC 50 Fixing Channel or cut and bent channels fixed horizontally between the studs.

Gypframe head and base channels do not generally have cut-outs, these need to be cut on site, paying attention to Health and Safety guidance. Grommets or isolating strip should be installed in these cut-outs to prevent abrasion of the cables.

If a blockwork wall lining system, such as **GypLyner UNIVERSAL**, does not have sufficient depth to accommodate the service then the background should be 'chased out' to the appropriate depth. Pipes or conduits should be fixed in position before dry lining work commences. To maintain an airtight construction, the perimeter of any penetration through the lining should be sealed as necessary at the time the services are being installed.

A zone formed by the installation of electrical accessories on one side of the wall or partition extends to the reverse side. This means that the concealed cable may be less than 50mm from the surface of the wall or partition on the reverse side. Therefore, before carrying out work, e.g. drilling into the surface, the other side of the wall or partition must always be checked to determine the location of any concealed cables. It is good practice to maintain a clear zone.

Where the location of electrical outlets cannot be determined from the reverse side, then the cable must either be mechanically protected or run at least 50mm from the surface of the wall or partition on the reverse side. Please see **Figure 12 – Minimum distance of cabling, and Figure 13 - Standard zones of cabling.**

Where heating pipes, particularly micro-bore systems, are to be located within the GypWall system, it is recommended that only one pipe is passed through each aperture/service cut-out in the metal framework. If this cannot be accommodated for whatever reason, it may be necessary to incorporate proprietary pipe restraining clips, or other means of keeping the pipes apart, to prevent vibration noise.

Service penetrations and fixing into Gyproc drywall systems

Fixing electrical socket boxes into Gyproc partitions and walls can impair both fire and acoustic performance, but with careful detailing this can be minimised. The relevant sections in this book offer specific guidance for the installation of socket boxes in separating walls, however designers should note that in particular the avoidance of back-to-back services is recommended. The plasterboard should always be neatly cut and sealant should be applied where optimum acoustic performance is required.

In fire-rated walls, the fire-stopping design is dependant on the period of fire resistance. Some typical details are shown in **Figure 17 - Socket box installation – up to 60 minutes fire resistance** and **Figure 18 - Socket box installation – up to 120 minutes fire resistance.**

There are a number of fire-stopping products including putty pads, available on the market from a range of manufacturers. Whilst Gyproc has no objection to the use of putty pads for example within drylining systems, all performance substantiation has to be provided by the fire-stopping manufacturer as is the case for any fire-stopping material.

Penetrations of fire-resistant constructions for services need careful consideration to ensure that the integrity of the element is not impaired, and also that the services themselves do not act as the mechanism of fire spread. It is important to use only those services and their installations that have been shown by fire test to be able to maintain the integrity of the construction. By designing service zones through which all services pass, the number of individual service penetrations can be minimised. Service zones can be sealed after installation of the services using a tested and substantiated fire-stopping system.

In most situations, the services will be installed by contractors other than the drylining contractor. It is important, therefore, that all relevant contractors should be advised as to where and how their service penetrations should be made and maintained. The necessity to independently support services will depend on their size and weight. Please contact the Gyproc Technical Team for guidance.

There is a wide variety of fixing devices suitable for securing fixtures and fittings to Gyproc systems. Generally, the choice of individual fixing devices will depend on the type of system and the loading requirements. This section gives recommendations on the selection of generic devices and proprietary fixings. **Table 9** gives example fixing devices and typical applications in drywall systems to meet the specific load criteria.

The guidance given is primarily concerned with fixtures at the time of installation. Subsequent installation is less easy, especially for heavier fixtures that will often require identification of the basic frame in hollow partitions or metal furring linings, if the lining is not to be locally deflected.

Services can be fixed to the face of the partition, using a Gypframe Service Support Plate, which carries 18mm plywood within the cavity of the partition as shown in **Figure 14 - General arrangement of service support plates showing studs at 600mm centres**. An alternative to this would be to install a metal or timber support framework within the cavity of the partition as shown in **Figure 17 - Socket box installation – up to 60 minutes fire resistance** and **Figure 18 - Socket box installation – up to 120 minutes fire resistance,** or **Figure 15 - Gypframe 103 FC 50 Fixing Channel.**

Dampers

Fire and smoke resisting dampers can be installed in to Gyproc's systems. Dampers prevent fire and smoke from passing from one fire compartment to another through heating, ventilation and air conditioning systems. 'An Industry Guide to the Design for the Installation of Fire and Smoke Resisting Dampers' is available from the Association of Specialist Fire Protection (ASFP) or as a download from www.asfp.org.uk. This document refers the designer to the principles of construction, and in particular to tested constructions, or to constructions assessed for performance in fire by a suitably qualified person.

Figures, 19 - Opening bridging studs for duct / damper penetration, 20 - Opening for service penetrations in fire-rated partitions and **21 - Fire tested construction in which the damper is supported by the partition** show a method of preparing openings for installing dampers up to a maximum weight of 57kg within Gyproc systems. As the performance of the complete assembly will depend on a number of elements, the actual details of the opening need to be determined in conjunction with the fire-stopping and damper manufacturers.

Useful reference documents covering international legislation and guidance

In the UK the installation of electrical services is carried out in accordance with the requirements of BS 7671, requirements for electrical installations, IEE Wiring Regulations. This was introduced in conjunction with the Institution of Engineering and Technology (IET), and is used for all books related to wiring regulations.

Service penetrations and fixing into Gyproc drywall systems

Fixing electrical socket boxes into Gyproc partitions and walls can impair both fire and acoustic performance, but with careful detailing this can be minimised. The relevant sections in this book offer specific guidance for the installation of socket boxes in separating walls, however designers should note that in particular the avoidance of back-to-back services is recommended. The plasterboard should always be neatly cut and sealant should be applied where optimum acoustic performance is required.

In fire-rated walls, the fire-stopping design is dependant on the period of fire resistance. Some typical details are shown in **Figure 17 - Socket box installation – up to 60 minutes fire resistance** and **Figure 18 - Socket box installation – up to 120 minutes fire resistance.**

There are a number of fire-stopping products including putty pads, available on the market from a range of manufacturers. Whilst Gyproc has no objection to the use of putty pads for example within drylining systems, all performance substantiation has to be provided by the fire-stopping manufacturer as is the case for any fire-stopping material.

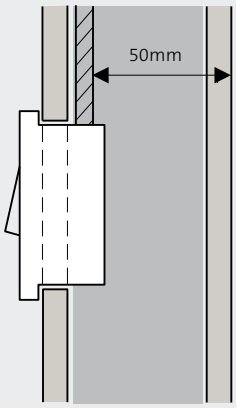
Penetrations of fire-resistant constructions for services need careful consideration to ensure that the integrity of the element is not impaired, and also that the services themselves do not act as the mechanism of fire spread. It is important to use only those services and their installations that have been shown by fire test to be able to maintain the integrity of the construction. By designing service zones through which all services pass, the number of individual service penetrations can be minimised. Service zones can be sealed after installation of the services using a tested and substantiated fire-stopping system.

In most situations, the services will be installed by contractors other than the drylining contractor. It is important, therefore, that all relevant contractors should be advised as to where and how their service penetrations should be made and maintained. The necessity to independently support services will depend on their size and weight. Please contact the Gyproc Technical Team for guidance.

There is a wide variety of fixing devices suitable for securing fixtures and fittings to Gyproc systems. Generally, the choice of individual fixing devices will depend on the type of system and the loading requirements. This section gives recommendations on the selection of generic devices and proprietary fixings. **Table 9** gives example fixing devices and typical applications in drywall systems to meet the specific load criteria.

Services installations

12 Minimum distance of cabling



Standard zones of cabling 13

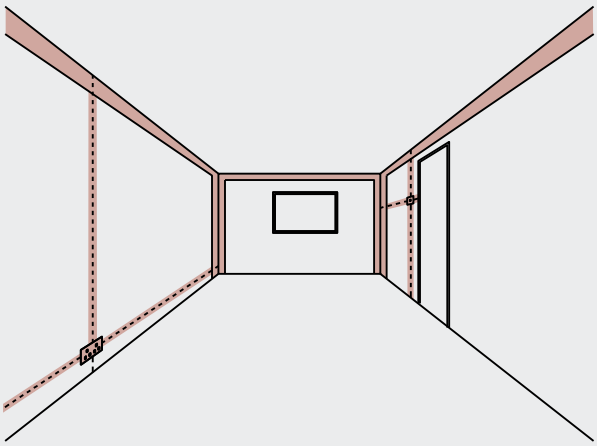


Table 9 - Example fixing devices and typical safe working loads on partitions and wall linings

System	Lightweight fixtures up to 3kg (e.g. socket)	Lightweight to medium fixtures 4 - 8kg (e.g. small mirror)	Medium weight fixtures 9 - 20kg (e.g. shelf)	Medium to heavy fixtures 21 - 50kg (e.g. cupboard)	Heavy fixtures 51 - 100kg (e.g. basin)
ShaftWall GypWall systems GypLyner IWL	A	B or C	D or I	G, H or I	K or H
GypLyner UNIVERSAL wall lining	A	B or C	D or E	J, K or L	K or L

Reference	Detail	Description	Typical SWL[1] (typical failure load)
A		No. 10 woodscrew into Gyproc plasterboard	3kg (12kg)
B		Steel picture hook and masonry nail into Gyproc plasterboard	4kg (16kg)
C		Metal self-drive into single layer Gyproc plasterboard	4kg (16kg)
		Metal self-drive into double layer Gyproc plasterboard into timber nogging	8kg (32kg)
D		Steel expanding cavity fixing, e.g. M5 x 40, into Gyproc plasterboard (board thicknesses up to 12.5mm)	12kg (48kg)
		Steel expanding cavity fixing, e.g. M5 x 65, into plasterboard (board thicknesses from 15mm to 28mm)	18kg (72kg)
E		Gyproc Drywall Screw fixed through Gyproc plasterboard into 0.5mm Gypframe metal stud / Gypframe 103 FC 50 Fixing Channel	19kg (76kg)
F		Heavy duty plastic plug fixed through Gyproc plasterboard into masonry with 55mm minimum penetration	20kg (140kg)
G		Gyproc Jack-Point Screws fixed through Gyproc plasterboard into minimum 0.8mm Gypframe metal stud / Gypframe 103 FC 90 Fixing Channel	30kg (120kg)
H		No.12 self-tapping screws fixed through Gyproc plasterboard into minimum 0.9mm Gypframe metal stud / Gypframe 103 FC 90 Fixing Channel	50kg (200kg)
I		Steel expanding metal cavity fixing, e.g. M4 x 40, through Gyproc plasterboard into 0.9mm Gypframe metal stud / Gypframe 103 FC 90 Fixing Channel (board thicknesses up to 12.5mm)	40kg (160kg)
		Steel expanding metal cavity fixing, e.g. M4 x 65, through Gyproc plasterboard into 0.9mm Gypframe metal stud / Gypframe 103 FC 90 Fixing Channel (board thicknesses from 15mm to 28mm)	50kg (200kg)
		Steel expanding metal cavity fixing, e.g. M5 x 65, fixing through Gyproc plasterboard into plywood supported by Gypframe Service Support Plate	50kg (200kg)
J		8mm steel frame fixing fixed through Gyproc plasterboard into masonry with minimum 55mm penetration	60kg (240kg)
K		No.12 self-tapping screw fixed through Gyproc plasterboard into timber sub-frame	120kg (480kg)
L		M8 steel bolt / anchor fixed through Gyproc plasterboard into masonry with minimum 55mm penetration	130kg (520kg)

1 Safe Working Load (SWL) - a safety factor of 4 (steel fixings) and 7 (plastic fixings) has been used.

For technical assistance on above fixings please contact the fixings manufacturer. The suitability of the fixing must be confirmed by the building designer / fixing manufacturer.

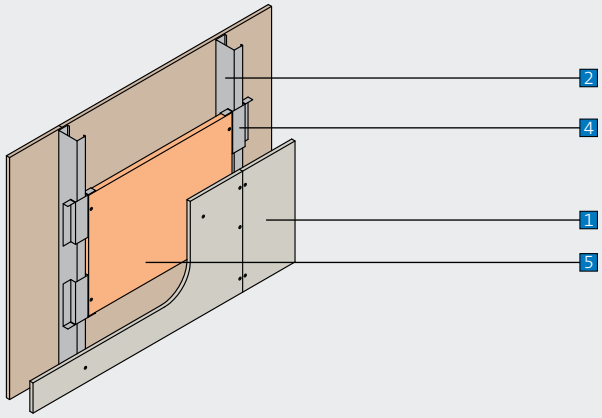
Reference can also be made to the Construction Fixing Association (CFA) guidance note 'Fixing For Plasterboard', which is currently under review by the CFA and can be accessed at www.fixingscfa.co.uk

The information within **Table 9** does not take into consideration any additional forces that may be applied whether it be accidental, abuse or otherwise.

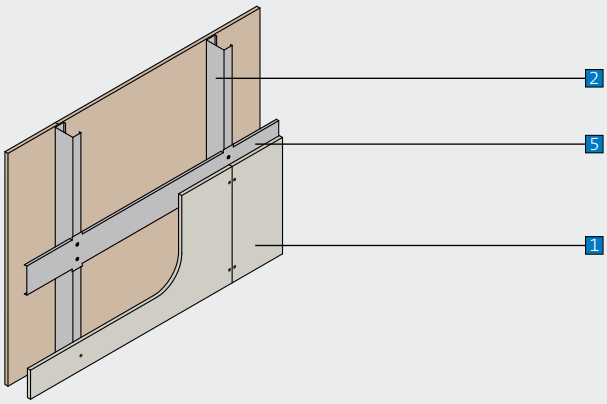
The example fixing devices, typical safe working loads and typical failure loads given in **Table 9** relate to the installation of single fixtures. It is important to ensure that the drylining system specified is capable of supporting the loads, particularly if installing multiple fixtures.

Services installations

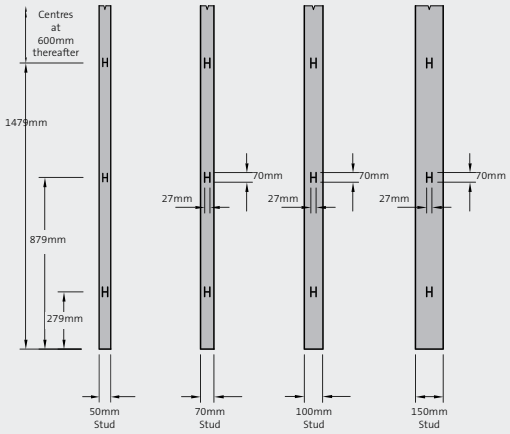
14 General arrangement of service support plates showing studs at 600mm centres



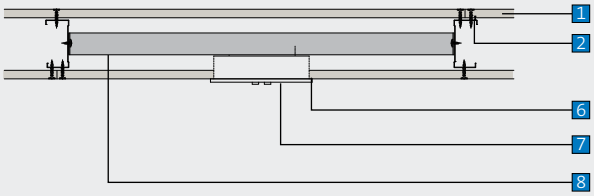
15 Gypframe 103 FC 50 Fixing Channel



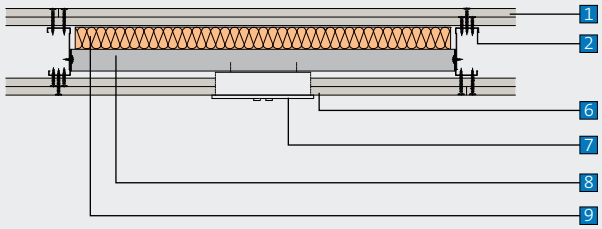
16 Gypframe studs service cut-out details - Gypframe 'C' and Gypframe 'I' Studs



17 Socket box installation - up to 60 minutes fire resistance

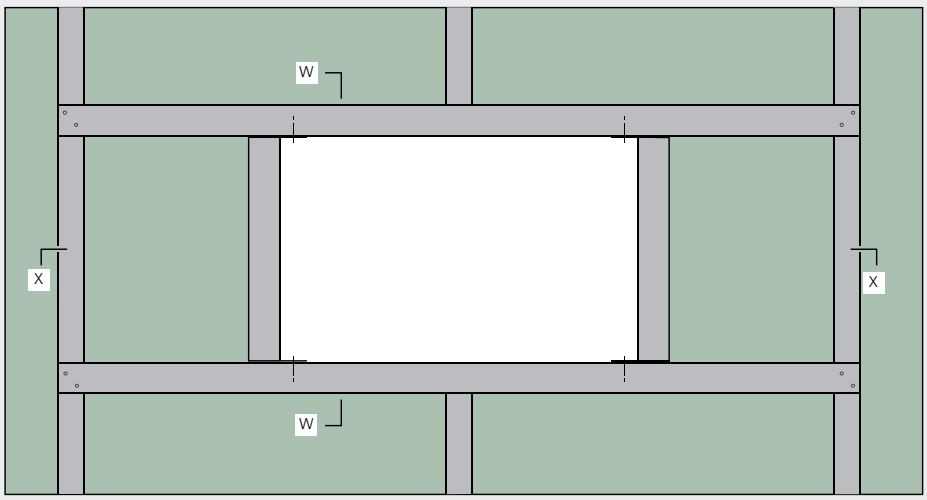


18 Socket box installation - up to 120 minutes fire resistance

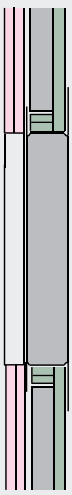


1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe 103 FC 50
4 Gypframe Service Support Plate
5 18mm plywood
6 Sealant at switch box perimeter for improved acoustics
7 Electrical socket with metal back box fitted tight into plasterboard
8 Gypframe Standard Floor & Ceiling Channel receiving fixing of socket box - channel legs tabbed, bent and fixed to metal studs with Gyproc Wafer Head Drywall Screws
9 Stone mineral wool (minimum 80kg/m³) backing to socket box

19 Opening bridging studs for duct / damper penetration



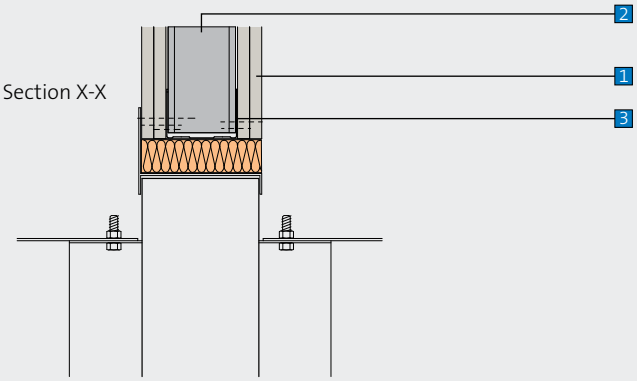
Section W-W

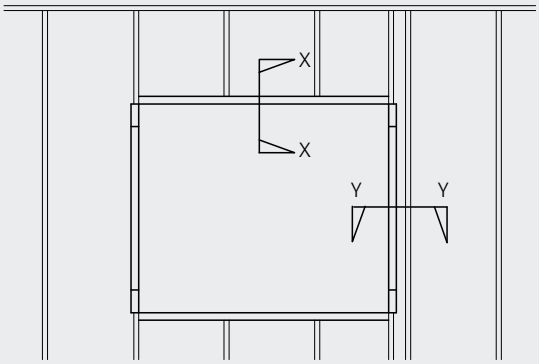


Section X-X

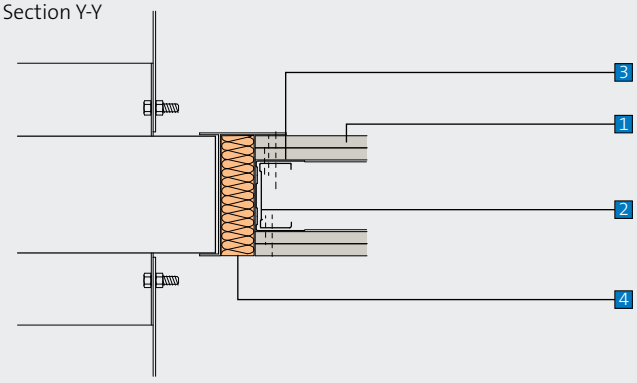
20 Typical opening for service penetrations in fire-rated partitions

Section X-X

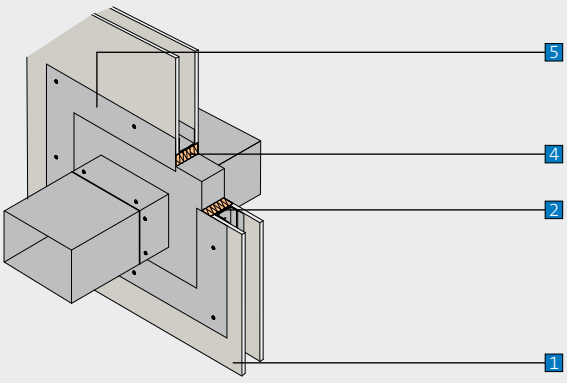




Section Y-Y



21 Fire rated construction which the damper is supported by the partition (isometric view)



1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe Floor & Ceiling Channel

4 Penetration seal as tested by damper manufacturer or proprietary alternative, confirmed as compatible by system designer / specifier (plasterboard lining around opening may not be required)
5 Damper (by others). Weight of damper should not exceed 57kg. Size of damper should not exceed 1400 x 1200mm

Health and Safety

Overview

This section is a practical guide to the manual lifting and handling of Gyproc products both safely and successfully. The pictures and advice are designed to help you get the best results from our products. Please use them alongside your project's own design criteria and your usual good practice and site safety precautions.

Introduction

Gyproc recognises the increasing importance of Health and Safety at work. Working with Pristine Condition, experts in lifting and handling, we developed have a series of 'Safe Systems of Work' for manual handling and lifting of our products.

The simple guidance in this section suggests appropriate methods for handling Gyproc products, including Gyproc plasterboards and accessories, Gypframe metal sections and Gyproc ceiling products.

Legislation and regulations

The details and guidance contained in this book and associated literature produced by Gyproc relate to international legislative and regulatory requirements and standards current at the date of publication of this document. It is the responsibility of the user to ensure that these remain current prior to use.

Health and Safety

The products and systems included in this document have been developed for use in residential, commercial and industrial buildings. Simple guidance on how to install these products and systems is given at the start of each relevant section. More detailed health and safety guidance is given in the Gyproc Technical DataSheets available to download from www.gyproc.ae

It is important to follow good site practice at all times and to ensure that appropriate safety precautions are taken, including the use of appropriate personal protection equipment and clothing when working with Gyproc products.

The following general notes on 'Safe Systems of Work' are offered for guidance

Personal protection equipment (PPE)

- Always wear Personal Protection Equipment (PPE) as directed on site.
- Hard hat and safety shoes are required at all times.
- Wear gloves and change them if they get wet.
- Always wear gloves when handling, carrying, cutting or fixing metal.
- Wear safety glasses and dust mask when mixing Jointing compounds or applying to ceilings and when sanding.
- Wear safety glasses when snipping metal pieces.
- Do not continue to work if safety glasses become fogged due to condensation. Stop work and clean the glasses until the lenses are clear and de-fogged.

Installation

- Gyproc drylining systems are not designed to support body weight. Fixers must work from an independent support system.
- When cutting boards, power and hand tools should be used with care and in accordance with the manufacturers' recommendations. Appropriate PPE should be used.
- Keep sanding and other dust generation to a minimum. Maintain adequate ventilation and / or wear suitable protection.

- Power tools should only be used by people who have been instructed and trained to use them safely.

Storage

• Store plasterboard, plasterboard accessories, metal sections and ceiling products in dry conditions.

• Protect ready-mixed materials from freezing conditions and direct sunlight.

• Practice good housekeeping and stock rotation.

• Don't attempt to separate boards using the forks of a fork-lift truck.

• Don't use hoists or cranes without safety retaining ropes or slings.

• When handling insulation or cutting board products containing glass-fibre, wear suitable protection including appropriate face mask and gloves. Wear goggles when working overhead.

Manual lifting and handling

• Wherever possible, place one foot in front of the other to produce a good base and reduce the pressure on the body.

• Assess the load by placing your hand on it and moving it.

• Only handle what you feel you can manage safely and comfortably.

• Initiate movements with your legs, unlocking the knees and driving with the legs to start the lift.

• Keep the load as close, or get as close as possible to the load when lifting or handling.

• Turn instead of twisting and move your feet.

• Let your back find its natural curvature.

• Never lose control of the load.

Work methods

• Rest for 15 seconds, many times throughout the day. Some studies have shown that micro pauses (short breaks) reduce stress and can lead to an increase in productivity 1.

• Rotate jobs; if one part of the job requires a lot of overhead work, switch for a while to an activity that uses different work motions.

1 Musculoskeletal problems in bricklayers, carpenters and plasterers: literature review and results of site visits, Health and Safety Laboratory, Sheffield UK: Health and Safety Executive, 2001.

Handling and storage

In designing and installing systems incorporating Gyproc products, full consideration must be taken of the local legal requirements in the areas of:

• Manual Handling Regulations.

• Construction (Design and Management) Regulations.

• Control of Substances Hazardous to Health Regulations (COSHH).

Your attention is brought to the following publications which give approved guidance:

• Manual Handling Guidance on Regulations ISBN 071762823X.

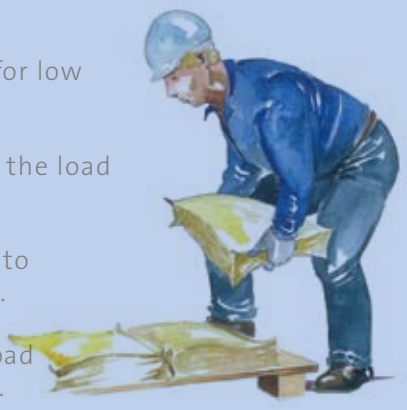
• Managing Health and Safety in Construction. Construction (Design and Management) Regulations ISBN 9 780717662234.

• Designing for Health and Safety in Construction ISBN
0 717608077.

Loading and unloading pallets

PPE: Hard hat, hi-vis vest and safety shoes required.

• Always place one foot forward by operating from the corner of the pallet or placing one foot on the pallet, taking care to ensure that the pallet does not tip in the process.



• Unlock the knees for low level work.

• Take a firm grip of the load with both hands.

• Lift using the legs to start the movement.

• Always keep the load close when carrying.

• **Do not lift with feet in line or withload in front of the front foot.**

Picking from mid-level

PPE: Hard hat, hi-vis vest and safety shoes required.

- Place one foot forward.
- Take a firm grip of the load.
- Pull the load to a point of pivot (using the legs if necessary).
- Pivot against the stack.
- Keep the load close.
- **Do not twist.**
- **Do not pick with feet in line.**

Handling buckets

PPE: Hard hat, gloves, hi-vis vest and safety shoes required.

- Always place one foot alongside the bucket before lifting, or pivot the bucket towards you before lifting.
- Take a firm grip with both hands.
- If heavy, you may need to tilt and take a grip of the base and the top of the bucket.
- Start the lift with the legs.
- Unlock the knees for low level work.
- Always turn by moving the feet.
- If taking two buckets, always carry in a balanced manner.

- **Only handle what you can manage.**
- **Do not carry heavy objects on one side.**
- **Do not twist.**

Handling lengths of metal

PPE: Gloves, hard hat, hi-vis vest and safety shoes required.

- Always approach the lengths of metal from one end.
- Place one foot forward.
- Unlock the knees for low level work.
- Take a firm grip.
- Lift using the legs to start the movement.
- **Do not pick from the middle of the stack. either**
- Work your way to the middle.
- Pivot the stack and carry in a balanced manner.

OR

- Place over the shoulder.
- Work your way to the middle (point of balance).
- Unlock the knees to rest the stack against the shoulder.
- Allow the stack to pivot against the shoulder as you stand up.
- Only carry over the shoulder if you can remain upright.
- Be aware of your surroundings when carrying lengths of metal in this way.
- **Do not lean.**

If removing from racks.

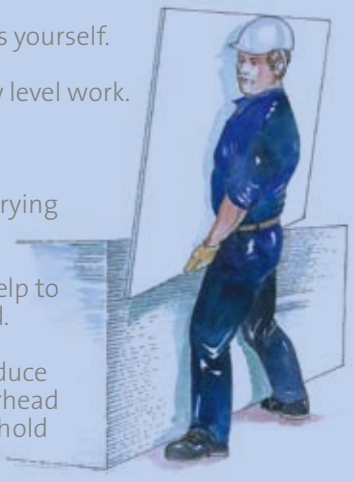
PPE: Gloves, hard hat and safety shoes required.

- Place one foot forward.
- Drive with the legs to bring the load to one end.
- Carry in a balanced manner.
- Always communicate during the lifts and carrying.

Handling boards

PPE: Hard hat, gloves, hi-vis vest and safety shoes required.

One person operation



- Pull the board in towards yourself.
- Unlock the knees for low level work.
- Lift by using the legs.
- Try using handles for carrying plasterboard.
- Improve your grip and help to make the lift less awkward.
- Tools are available to reduce the time you spend in overhead work and holding, to help hold boards in place for fixing.
- Use team lifting where appropriate.

- Carry the board in a balanced manner (for large boards, you can support the board on the top of the chest/ shoulder).
- Only lift what you feel you can manage.
- If necessary, seek assistance.
- When stacking boards, position boards sideways slightly in front of you, so you do not have to reach over your head or twist your body to lift them.
- Position panels to lean flat against a wall and do not wobble or slide.
- Push and slide panels along their edge or get assistance from a co-worker.

Two person operation

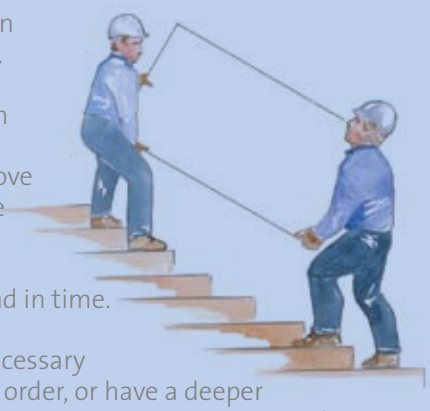
- Operate from the corners of the stack.
- Unlock the knees for low level work.
- Lift board together to vertical position.
- Only lift what you feel you can manage.
- Carry in a balanced manner across the body.
- If walking backwards, ensure it is over the shortest possible distance and clear the route beforehand.

- **Do not carry heavy objects on one side.**

Carrying board up / down stairs

PPE: Hard hat, gloves, hi-vis vest and safety shoes required.

- Whether going up or down stairs, place one foot forward then bring both feet together on each step.
- Keep the boards in a balanced manner.
- Place both feet on each stepbefore moving off to improve control and balance throughout the lift.



- Work together and in time.
- Stop wherever necessary (if steps are in poor order, or have a deeper drop, you may need to place the load down first).
- Only lift what you feel you can manage.

Fixing walls

PPE: Eye protection, gloves, hard hat, hi-vis vest and safety shoes required.

- Operate in a balanced manner.
- Always keep one foot forward.
- Unlock the knees for low level work.
- Always work in front of the body.
- Use appropriate platforms where necessary.

- **Do not over-reach or stretch to the sides or above the head.**

Lifting plasterboards into place (including ceilings) - two person operation

PPE: Eye protection, hard hat, gloves, hi-vis vest and safety shoes required.

- Communicate – work together.
- Take a firm grip of the board in both hands.
- Unlock the knees to place board into position.
- Always work in front of the body.

Fixing ceilings

PPE: Eye protection, hard hat and safety shoes required.

- Always work in a balanced position.
- Operate with one foot forward.
- Keep the body upright.
- Always use appropriate platforms where necessary.

- **Do not over- reach.**

All content and imagery in this section has been produced in association with

Environment and Sustainability

Overview

Sustainability is increasingly important when specifying products and systems with manufacturing and construction are often perceived as making heavy demands on the environment. For this reason, Gyproc is committed to minimising its impact on valuable natural resources, through a managed programme of waste reduction, pollution prevention, energy efficiency and the manufacture of sustainable construction products and systems. In this manner we strive to provide products and systems that enable customers to build in a more sustainable and responsible way.

Sustainable development relies on the balancing of social, economic and environmental objectives. In any given construction project it is vital that all three pillars are considered in order to deliver a sustainable solution.

Social sustainability means we have a responsibility to identify the needs of individuals and consider their well-being. It is a respect for people, their health and safety, their development and their environment.

Our commitment to economic sustainability means we are best placed to deliver on our promises to our stakeholders and grow our business year on year.

Good economic sustainability helps reduce operating and financial risk, improve efficiency, and ensures we are in a strong position to plan our investments and develop opportunities now and in the future.

Environmental sustainability is probably the most recognised aspect of sustainable development and one of the most difficult to manage effectively. Gyproc is concerned with protecting and conserving both biodiversity and the environment by reducing atmospheric pollution through various environment management programs.

We have introduced site Environmental Health & Safety Management System (EHSMS) governed by our local industrial regulatory authority - Zones Corp. This is an integrated system of **ISO 14001** and **OHSAS 18001**.

Every Gyproc product and system is designed for minimum environmental impact, maximum energy efficiency, and minimum risk to health at every level. We actively work to sustain natural resources through our commitment to recycling and use recycled materials where possible.

Waste Management

The total cost of waste is a lot higher than the cost of removal. As a result, Gyproc works closely with customers to eliminate and reduce waste before it enters on to site.

Eliminate: Best practice design assistance at specification stage, ensuring systems are value engineered and developed to best suit on-site situations.

Reduce: Designing out waste in specifications, using bespoke board sizes and metal, on-site technical support and developing new building practices.

Reuse: Best practice use of board types and sizes, making off-cuts easier to use on site.

Recycle: About 5.0% of scrap waste is generated during the production process of which 0.5% is recycled. In addition, our plasterboard is manufactured using 97% recycled paper.

Environmental Management

As part of our drive to continuously improve our performance, we have invested significant resource in developing an Environment Health and Safety Management System (EHSMS) governed by our local industrial regulatory authority - Zones Corp.

We have developed our environmental management systems to bring them in line with the internationally accepted **ISO 14001** and **OHSAS 18001** standard.

This certification emphasises the stringent environmental standards maintained across the business and will enable Gyproc to support customers through the delivery of sustainable construction products.

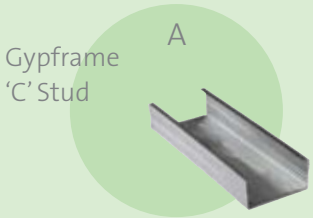
In addition, part of Gyproc's sustainability strategy is to optimise the use of recycled and reclaimed raw materials in the manufacture of products, designing them to minimise unnecessary waste.

GypWall CLASSIC

34 – 59 R_w dB

30 – 180 mins

GypWall CLASSIC is the industry's original lightweight drywall partition system, providing cost-effective, multi-purpose solutions suitable for all types of buildings.



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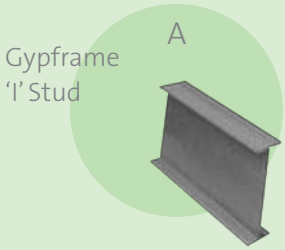
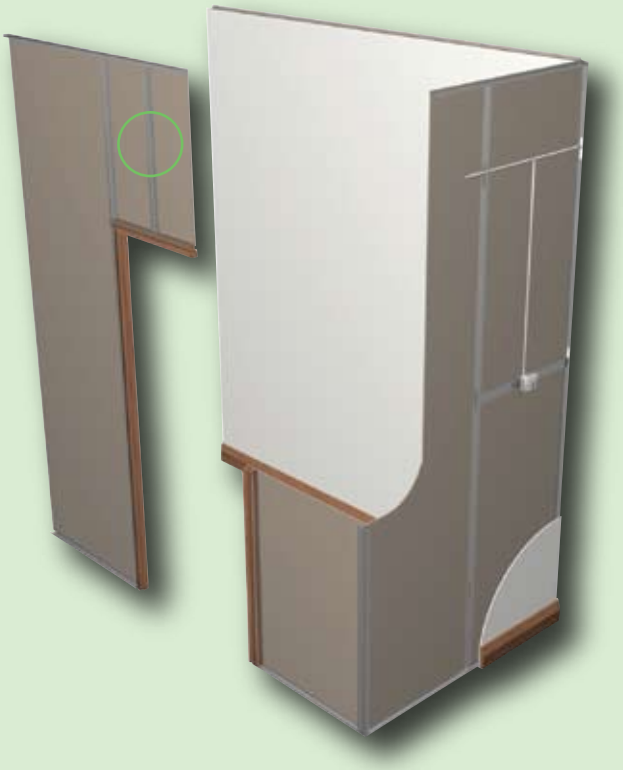




Key facts

- Range of stud options to match performance requirements
- Satisfies BS 5234 requirements up to and including Severe Duty[1]
- 30 - 180 minutes fire resistance to BS standards
- Achieves high levels of sound insulation up to Rw 59 dB
- Accommodates services within the stud cavity
- Can allow for deflection at the head
- Lightweight system solutions

1 Refer to Principles of robust design.

Applications

Due to the design flexibility of Gyproc systems, they can be tailored to meet the requirements of a wide range of applications.

Sector

- ✓ Office / commercial
- ✓ Retail
- ✓ Sport and leisure
- ✓ Education
- ✓ Healthcare
- ✓ Industrial
- ✓ Housing
- ✓ Apartment buildings
- ✓ High-rise multi-occupancy

System components

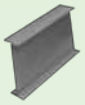
Gypframe metal products

50 S 50 'C' Stud — **Length** 3000mm

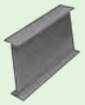
70 S 50 'C' Stud — **Length** 3000mm

100 S 50 'C' Stud — **Length** 3000mm

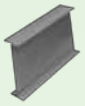
150 S 50 'C' Stud — **Length** 3000mm



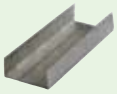
70 I 70 'I' Stud — **Length** 3000mm



100 I 80 'I' Stud — **Length** 3000mm



150 I 90 'I' Stud — **Length** 3000mm



Floor & Ceiling Channels
Standard (C), Deep Flange Floor & Ceiling Channel (DC) and Extra Deep Flange Floor & Ceiling Channel (EDC). All channels are available in 3000mm.

103 FC 50 Fixing Channel — **Length** 3000mm

GFS1 Fixing Strap — **Length** 2400mm

Board products

Gyproc Regular
Thickness 12.5, 15mm
Width 1200mm

Gyproc Moisture Resistant
Thickness 12.5, 15mm
Width 1200mm

Gyproc FireStop[1]
Thickness 12.5, 15mm
Width 1200mm

1 Moisture resistant (MR) versions of the above boards are specified in intermittent wet use areas, e.g. shower cubicles.

Fixing and finishing products

Gyproc Wafer Head Drywall Screws
For Gypframe metal-to-metal fixing less than 0.8mm thick.
or

Gyproc Wafer Head Jack-Point Screws
For Gypframe metal-to-metal fixing 0.8mm thick or greater

Gyproc Drywall Screws
For fixing boards to Gypframe metal framing less than 0.8mm thick.
or

Gyproc Jack-Point Screws
For fixing boards to Gypframe metal framing 0.8mm thick or greater.

Gyproc Jointing Compound
For seamless jointing.

Gyproc Paper Tape
For joint reinforcement.

Gyproc Fibre Tape
For joint reinforcement.

Insulation products

Isover Acoustic Partition Roll
25mm, 50mm and 75mm, for improved acoustic performance.

Stone mineral wool (by others)
For fire stopping.

Eligible for the SpecSure warranty from Gyproc

Installation overview

Gypframe Floor & Ceiling Channel is fixed at the head and base to achieve the specified wall thickness. Gypframe 'C' Studs are fitted vertically to friction-fit within the channel sections and to abutments, to form the framework. This allows for adjustment during boarding. Studs should be fitted to face the same way and extended by splicing to the specified height. Additional framing is installed as required to support heavy fixtures. Insulation is installed into the cavity-formed frameworks. The frames are braced using suitable Gypframe stud nagging at specified centres. Sealant is applied to the frame perimeters to seal airpaths. Boards are screw-fixed to framing members to form the lining. Horizontal joints in face layer boards should be backed with Gypframe GFS1 Fixing Strap or stud nogging.

Openings

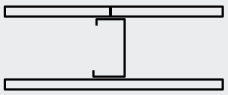
Details for openings differ according to Duty requirements. See Design - Door openings later for further details.

Services

Electrical and other services are normally installed after one side is boarded. Horizontal runs are routed through pre-formed cut-outs in the studs.Stud naggings can be installed between studs to support recessed switch boxes / socket outlets, or a high performance socket box detail used where higher acoustic performance is required.

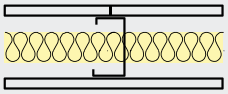
Table 1 – GypWall CLASSIC 50mm Gypframe 'C' Studs - single and multiple layer board linings Solutions to satisfy the requirements of BS 476: Part 22: 1987

1



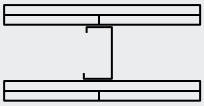
One layer of board each side of 50mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

2



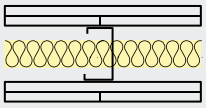
One layer of board each side of 50mm Gypframe 'C' Studs at 600mm centres. 25mm Isover APR in the cavity. Linings as in table.

3



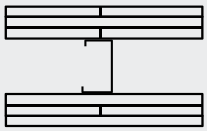
Two layers of board each side of 50mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

4



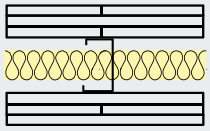
Two layers of board each side of 50mm Gypframe 'C' Studs at 600mm centres. 25mm Isover APR in the cavity. Linings as in table.

5



Three layers of board each side of 50mm Gypfrome 'C' Studs at 600mm centres.

6



Three layers of board each side of 50mm Gypfrome 'C' Studs at 600mm centres. 25mm Isover APR in the cavity. Linings as in table.

for single layer Severe Duty solutions please refer to GypWall ROBUST

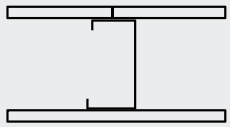
Detail	Partition thickness mm	Board type	Lining thickness mm	Maximum partition heights[1] mm	Sound insulation R_w dB	Duty rating	Approx. weight kg/m²	System reference
	30 minutes fire resistance BS							
1	77	Regular	1 x 12.5	2500	34	Medium	18	A206001
2	77	Regular	1 x 12.5	2500	40	Medium	18	A206033
1	82	Regular	1 x 15	2800	36	Medium	21	A206002
2	82	Regular	1 x 15	2800	42	Medium	21	A206034
	60 minutes fire resistance BS							
1	82	FireStop	1 x 15	2800	36	Heavy	24	A206066
2	82	FireStop	1 x 15	2800	42	Heavy	24	A206098
3	102	Regular	2 x 12.5	3400	42	Severe	35	A206003
4	102	Regular	2 x 12.5	3400	49	Severe	35	A206035
	90 minutes fire resistance BS							
3	112	Regular	2 x 15	3700	45	Severe	42	A206004
4	112	Regular	2 x 15	3700	49	Severe	42	A206036
5	127	Regular	3 x 12.5	3700	49	Severe	55	A206155
6	127	Regular	3 x 12.5	3700	53	Severe	56	A206187
	120 minutes fire resistance BS							
3	102	FireStop	2 x 12.5	3400	42	Severe	40	A206067
4	102	FireStop	2 x 12.5	3400	49	Severe	40	A206099
	180 minutes fire resistance BS							
5	142	FireStop	3 x 15	3700	49	Severe	70	A206252
6	142	FireStop	3 x 15	3700	53	Severe	71	A206252

1 Based on a limiting deflection of L/240 at 200 Pa. Greater heights can be achieved through the use of Gypframe 'I' Studs, or reduced stud centres. Refer to Principles of robust design.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

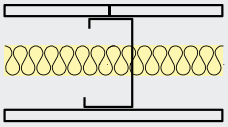
Table 2 – GypWall CLASSIC 70mm Gypframe 'C' Studs - single layer board linings Solutions to satisfy the requirements of BS 476: Part 22: 1987

1



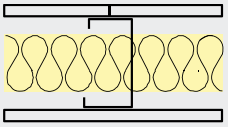
One layer of board each side of 70mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

2



One layer of board each side of 70mm Gypframe 'C' Studs at 600mm centres. 25mm Isover APR 1200 in the cavity. Linings as in table.

3



One layer of board each side of 70mm Gypframe 'C' Studs at 600mm centres. 50mm Isover APR 1200 in the cavity. Linings as in table.

for single layer Severe Duty solutions please refer to GypWall ROBUST

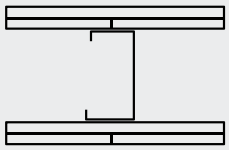
Detail	Partition thickness mm	Board type	Lining thickness mm	Maximum partition height[1] mm	Sound insulation R_w dB	Duty rating	Approx. weight kg/m²	System reference
	30 minutes fire resistance BS							
1	97	Regular	1 x 12.5	3600	36	Medium	18	A206013
2	97	Regular	1 x 12.5	3600	42	Medium	18	A206045
3	97	Regular	1 x 12.5	3600	43	Medium	19	A206138
1	102	Regular	1 x 15	3800	38	Medium	22	A206014
2	102	Regular	1 x 15	3800	43	Medium	22	A206046
3	102	Regular	1 x 15	3800	44	Medium	22	A206139
	60 minutes fire resistance BS							
1	102	FireStop	1 x 15	3800	37	Heavy	24	A206078
2	102	FireStop	1 x 15	3800	43	Heavy	24	A206110
3	102	FireStop	1 x 15	3800	44	Heavy	25	A206141

1 Based on a limiting deflection of L/240 at 200 Pa. Greater heights can be achieved through the use of Gypframe 'I' Studs, or reduced stud centres. Refer to Principles of robust design.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

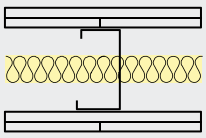
Table 3 – GypWall CLASSIC 70mm Gypframe 'C' Studs - multiple layer board linings Solutions to satisfy the requirements of BS 476: Part 22: 1987

1



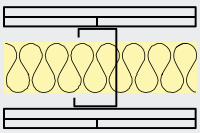
Two layers of board each side of 70mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

2



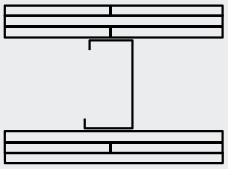
Two layers of board each side of 70mm Gypframe 'C' Studs at 600mm centres. 25mm Isover APR 1200 in the cavity. Linings as in table.

3



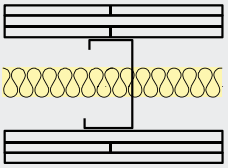
Two layers of board each side of 70mm Gypframe 'C' Studs at 600mm centres. 50mm Isover APR 1200 in the cavity. Linings as in table.

4



Three layers of board each side of 70mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

5



Three layers of board each side of 70mm Gypfrome 'C' Studs at 600mm centres. 25mm Isover APR 1200 in the cavity. Linings as in table.

For single layer Severe Duty solutions please refer to GypWall ROBUST

Detail	Partition thickness mm	Board type	Lining thickness mm	Maximum partition heights[1] mm	Sound insulation R_w dB	Duty rating	Approx. weight kg/m²	System reference
	60 minutes fire resistance BS							
1	122	Regular	2 x 12.5	4600	45	Severe	35	A206015
2	122	Regular	2 x 12.5	4600	49	Severe	35	A206047
3	122	Regular	2 x 12.5	4600	50	Severe	36	A206142
	90 minutes fire resistance BS							
1	132	Regular	2 x 15	4900	46	Severe	42	A206016
2	132	Regular	2 x 15	4900	50	Severe	42	A206048
4	147	Regular	3 x 12.5	4900	51	Severe	55	A206167
5	147	Regular	3 x 12.5	4900	56	Severe	56	A206231
	120 minutes fire resistance BS							
1	122	FireStop	2 x 12.5	4600	46	Severe	40	A206079
2	122	FireStop	2 x 12.5	4600	49	Severe	40	A206111
3	122	FireStop	2 x 12.5	4600	50	Severe	41	A206144
	180 minutes fire resistance BS							
4	162	FireStop	3 x 15	4900	51	Severe	70	A206252
5	162	FireStop	3 x 15	4900	56	Severe	71	A206252

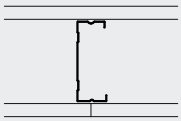
1 Based on a limiting deflection of L/240 at 200 Pa. Greater heights can be achieved through the use of Gypframe 'I' Studs, or reduced stud centres. Refer to Principles of robust design.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

NB For heights between 4200mm and 8000mm, Gypframe Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

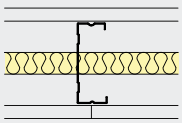
Table 4 – GypWall CLASSIC 100mm Gypframe 'C' Studs - single and multiple layer board linings Solutions to satisfy the requirements of BS 476: Part 22: 1987

1



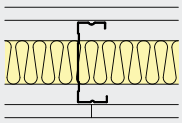
One layer of board each side of 100mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

2



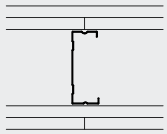
One layer of board each side of 100mm Gypframe 'C' Studs at 600mm centres. 25mm Isover APR 1200 in the cavity. Linings as in table.

3



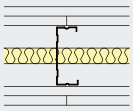
One layer of board each side of 100mm Gypframe 'C' Studs at 600mm centres. 50mm Isover APR 1200 in the cavity. Linings as in table.

4



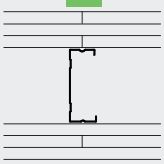
Two layers of board each side of 100mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

5



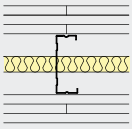
Two layers of board each side of 100mm Gypframe 'C' Studs at 600mm centres. 25mm Isover APR 1200 in the cavity. Linings as in table.

6



Three layers of board each side of 100mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

7



Three layers of board each side of 100mm Gypfrome 'C' Studs at 600mm centres. 25mm Isover APR 1200 in the cavity. Linings as in table.

For single layer Severe Duty solutions please refer to GypWall ROBUST

Detail	Partition thickness mm	Board type	Lining thickness mm	Maximum partition heights[1] mm	Sound insulation R_w dB	Duty rating	Approx. weight kg/m2	System reference
	30 minutes fire resistance BS							
1	127	Regular	1 x 12.5	4500	36	Medium	19	A206013
2	127	Regular	1 x 12.5	4500	42	Medium	20	A206045
3	127	Regular	1 x 12.5	4500	43	Medium	20	A206138
	60 minutes fire resistance BS							
4	152	Regular	2 x 12.5	5700	45	Severe	37	A206015
5	152	Regular	2 x 12.5	5700	49	Severe	38	A206047
1	132	FireStop	1 x 15	4700	40	Heavy	25	A206265
2	132	FireStop	1 x 15	4700	44	Heavy	25	A206266
3	132	FireStop	1 x 15	4700	44	Heavy	25	A206141
	90 minutes fire resistance BS							
4	162	Regular	2 x 15	5900	46	Severe	44	A206016
5	162	Regular	2 x 15	5900	50	Severe	45	A206048
6	177	Regular	3 x 12.5	5900	52	Severe	55	A206199
7	177	Regular	3 x 12.5	5900	56	Severe	56	A206199
	120 minutes fire resistance BS							
4	152	FireStop	2 x 12.5	5700	46	Severe	40	A206079
5	152	FireStop	2 x 12.5	5700	49	Severe	41	A206111
4	162	FireStop	2 x 15	5900	50	Severe	52	A206273
5	162	FireStop	2 x 15	5900	52	Severe	52	A206274
	180 minutes fire resistance BS							
6	192	FireStop	3 x 15	5900	52	Severe	71	A206252
7	192	FireStop	3 x 15	5900	56	Severe	72	A206252

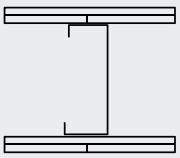
1 Based on a limiting deflection of L/240 at 200 Pa. Greater heights can be achieved through the use of Gypframe 'I' Studs, or reduced stud centres. Refer to Principles of robust design.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

NB For heights between 4200mm and 8000mm, Gypframe Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

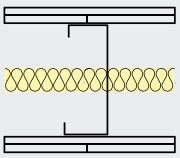
Table 5 – GypWall CLASSIC 150mm Gypframe 'C' Studs multiple layer board linings Solutions to satisfy the requirements of BS 476: Part 22: 1987

1



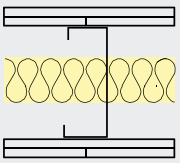
Two layers of board each side of 150mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

2



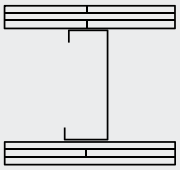
Two layers of board each side of 150mm Gypframe 'C' Studs at 600mm centres. 25mm Isover APR 1200 in the cavity. Linings as in table.

3



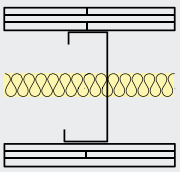
Two layers of board each side of 150mm Gypframe 'C' Studs at 600mm centres. 50mm Isover APR 1200 in the cavity. Linings as in table.

4



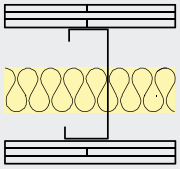
Three layers of board each side of 150mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

5



Three layers of board each side of 150mm Gypframe 'C' Studs at 600mm centres. 25mm Isover APR 1200 in the cavity. Linings as in table.

6



Three layers of board each side of 150mm Gypframe 'C' Studs at 600mm centres. 50mm Isover APR 1200 in the cavity. Linings as in table.

For single layer Severe Duty solutions please refer to GypWall ROBUST

Detail	Partition thickness mm	Board type	Lining thickness mm	Maximum partition heights[1] mm	Sound insulation R_w dB	Duty rating	Approx. weight kg/m²	System reference
	60 minutes fire resistance BS							
1	202	Regular	2 x 12.5	7600	50	Severe	35	A206027
2	202	Regular	2 x 12.5	7600	51	Severe	35	A206059
3	202	Regular	2 x 12.5	7600	51	Severe	36	A206149
	90 minutes fire resistance BS							
1	212	Regular	2 x 15	7900	50	Severe	42	A206028
2	212	Regular	2 x 15	7900	51	Severe	42	A206060
4	227	Regular	3 x 12.5	7900	56	Severe	56	A206179
5	227	Regular	3 x 12.5	7900	58	Severe	57	A206211
6	227	Regular	3 x 12.5	7900	59	Severe	57	A206243
	120 minutes fire resistance BS							
1	202	FireStop	2 x 12.5	7600	50	Severe	40	A206091
2	202	FireStop	2 x 12.5	7600	51	Severe	40	A206123
3	202	FireStop	2 x 12.5	7600	51	Severe	41	A206151
	180 minutes fire resistance BS							
4	242	FireStop	3 x 15	7900	56	Severe	72	A206252
5	242	FireStop	3 x 15	7900	58	Severe	73	A206252
6	242	FireStop	3 x 15	7900	59	Severe	73	A206252

1 Based on a limiting deflection of L/240 at 200 Pa. Greater heights can be achieved through the use of Gypframe 'I' Studs, or reduced stud centres. Refer to Principles of robust design.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

NB For heights between 4200mm and 8000mm, Gypframe Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

Design

Planning - key factors
The position of services and heavy fixtures should be pre-determined and their installation planned into the frame erection stage.

Cavity fire barriers
Minimum 12.5mm Gyproc plasterboard, screw-fixed into the web of perimeter channels or vertical studs, will provide a satisfactory closure to flame or smoke.

Services
Penetrations
Penetrations of fire-resistant or sound-insulating constructions for services need careful consideration to ensure that the performance of the element is not downgraded and also that the services themselves do not act as the mechanism of fire spread or sound transmission.

Independent support
When designing for the installation of services such as fire dampers and associated ductwork through a **GypWall** partition, consideration should be given to the size and weight of the damper - this will determine whether it can be supported directly from the partition or needs to be independently supported from the structure.

Electrical
The installation of electrical services should be carried out in accordance with the relevant controlling authority and / or procedures. The cut-outs in the studs can be used for routing electrical and other small services (see **Construction details – 1**). Switch boxes and socket outlets can be supported from Gypframe 103 FC 50 Fixing Channel fixed horizontally between studs, or a high performance socket box detail used where higher acoustic performance is required.

Cables should be protected by conduit, or other suitable precautions taken to prevent abrasion when they pass through the metal frame.

Fixing floor and ceiling channels
Gypframe Floor & Ceiling Channels must be securely fixed with a row of fixings at 600mm maximum centres. For 102mm channels and above, two rows of staggered fixings are required, each row at 600mm centres and each fixing 25mm in from the flange. If the floor is uneven, a 38mm thick timber sole plate equal to the width of the channel should be used.

If the concrete or screeded floor is new, consideration should be given to the installation of a damp-proof membrane between the floor surface and the channel or sole plate.

Door openings
The designer should consider thickness tolerances of the partition types in relation to the proposed door frame detail. Standard door frame detailing to suit BS 5234 Light and Medium Duty applications is shown in **Construction details – 20**. Detailing to satisfy BS 5234 requirements for Heavy and Severe Duty is shown in **Construction details – 21 - 22.** The door manufacturer should also be consulted in relation to door details.

Framing surround for openings
Where services such as horizontal ducts, fire dampers and access panels are required to penetrate the wall, their position should be pre-determined in order that a framed opening can be provided. The openings should be constructed using established metal stud procedures. See **Construction details – 26 - 27.**

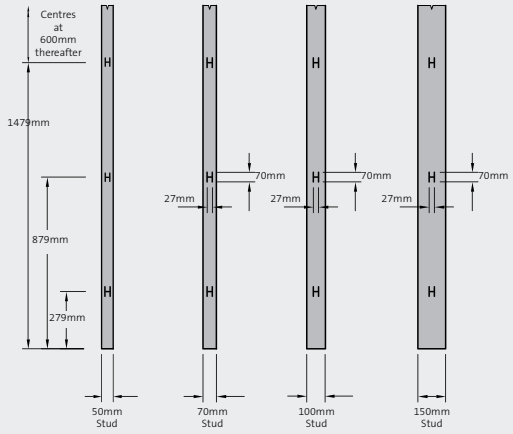
Control joints
Control joints may be required in the partition to relieve stresses induced by expansion and contraction of the structure (see **Construction details – 12**). They should coincide with movement joints within the surrounding structure.

Deflection heads
Partition head deflection designs may be necessary to accommodate deflections in the supporting floor. Deflection heads may also be required to the underside of roof structures subjected to positive and negative pressures. Refer to **Construction details – 16 - 19.**

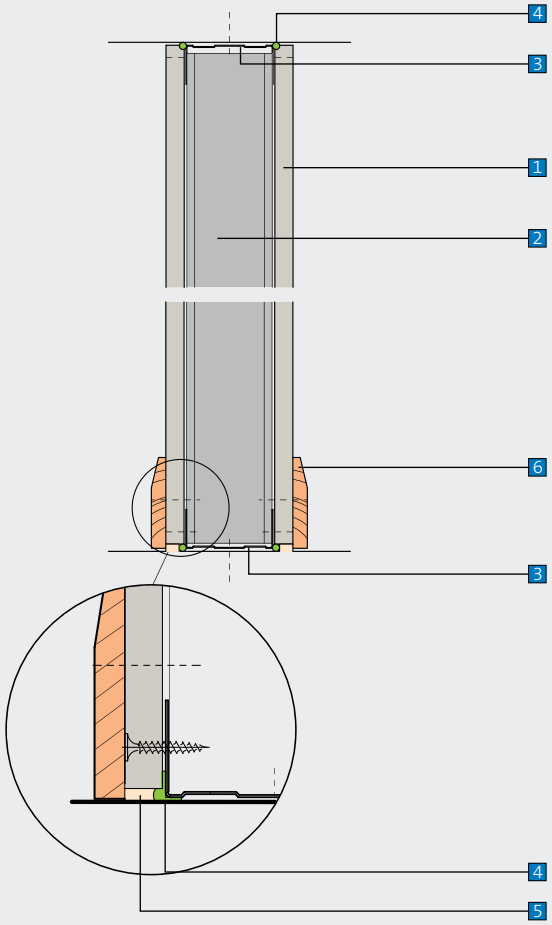
Access for maintenance
Gyproc Access Panels are available to provide access for maintenance. Access panels must be fully compatible with drywall construction and match the fire rating of the partition.

Construction details

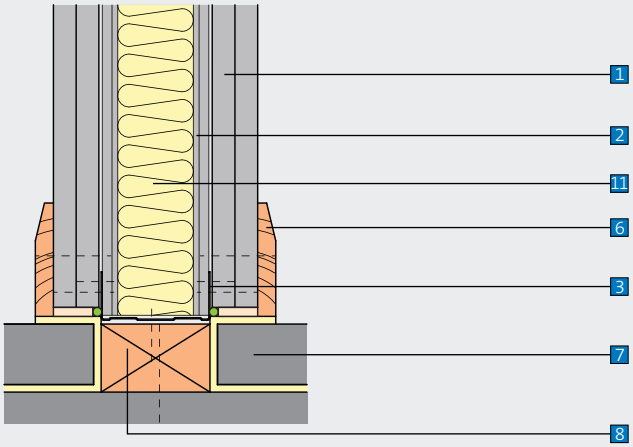
1 Service cut-outs - Gypframe 'C' and Gypframe 'I' Studs



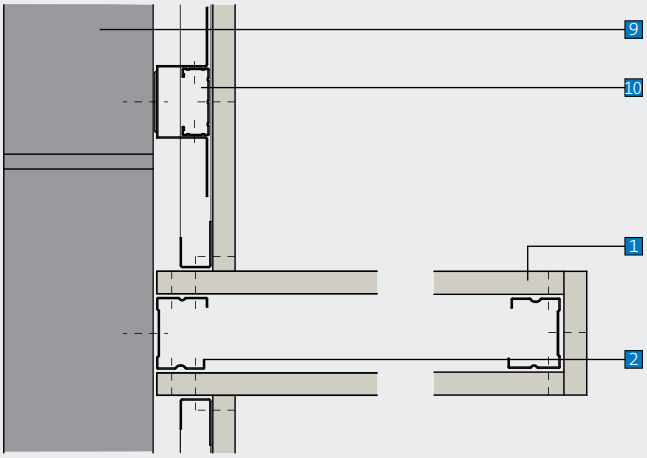
2 Head and base



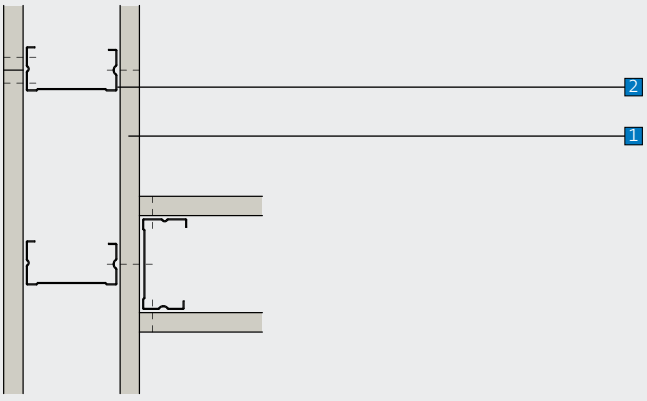
3 Base with timber sole plate



4 Junction with masonry and stop end detail



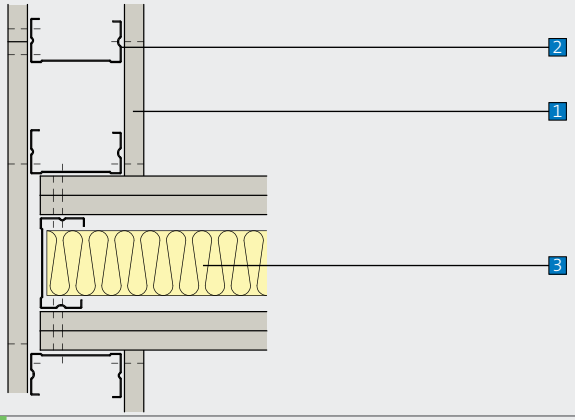
5 'T' junction - single layer



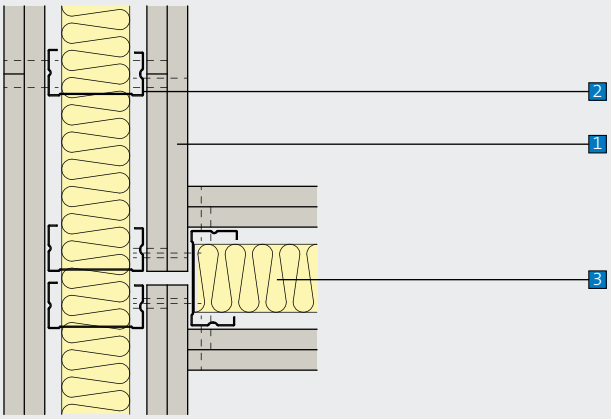
1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe Floor & Ceiling Channel
4 Sealant by others
5 Bulk fill with Gyproc jointing materials (where gap exceeds 5mm)
6 Skirting
7 Floating screed on resilient layer
8 Timber sole plate suitably fixed to structure
9 Internal blockwork
10 GypLyner wall lining system
11 Isover insulation

Construction details

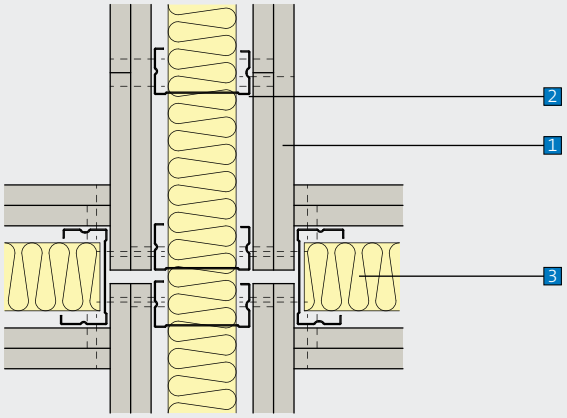
6 'T' Junction when partition with higher acoustic performance abuts a partition with lower acoustic performance. Acoustic principles only - detail may not be suitable for all solutions



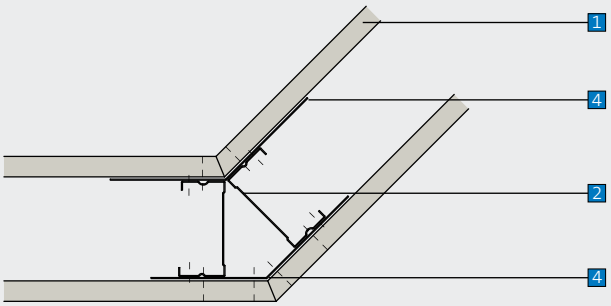
7 'T' junction to optimise acoustic performance and reduce flanking transmission



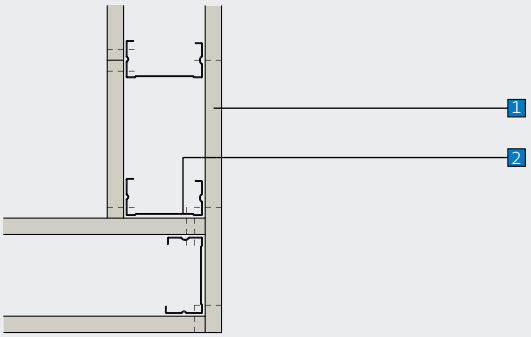
8 Four way junction to optimise acoustic performance and reduce flanking transmission



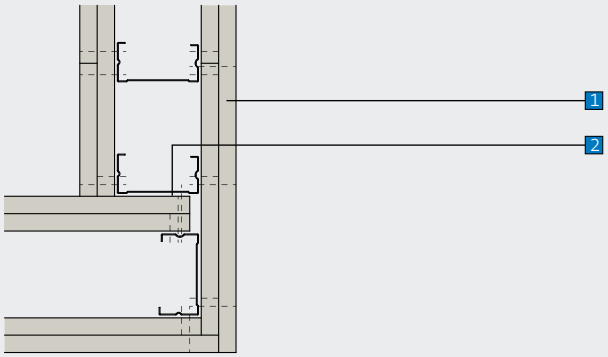
9 Splayed corner



10 Corner detail - single layer



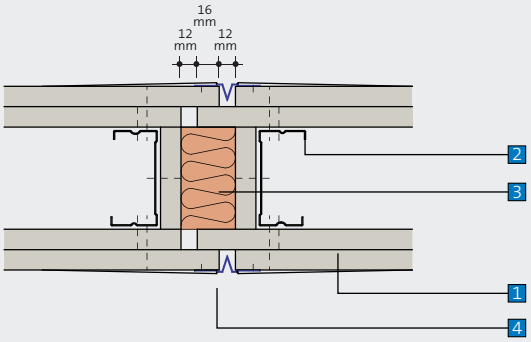
11 Corner detail - double layer



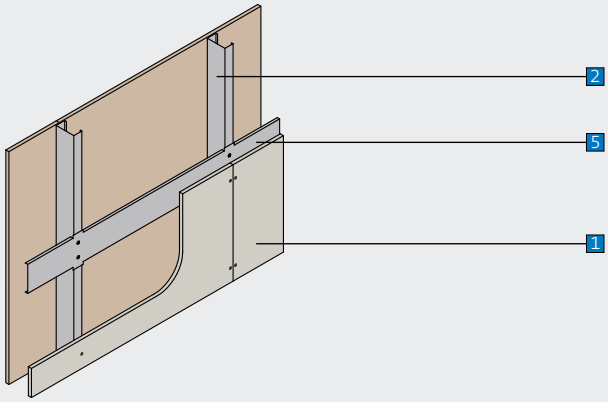
1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Isover insulation
4 Splayed Angle

Construction details

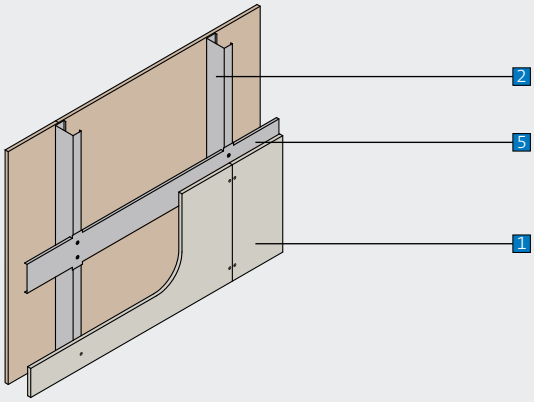
12 Typical control joint



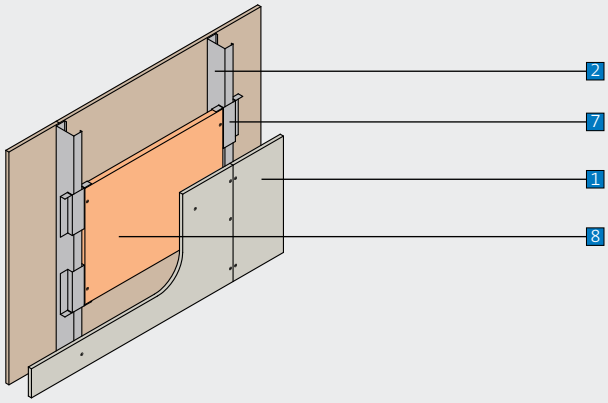
13 Gypframe 103 FC 50 Fixing Channel (short legs flattened at stud positions) for medium weight fixtures



14 Gypframe 103 FC 90 Fixing Channel for medium weight fixtures



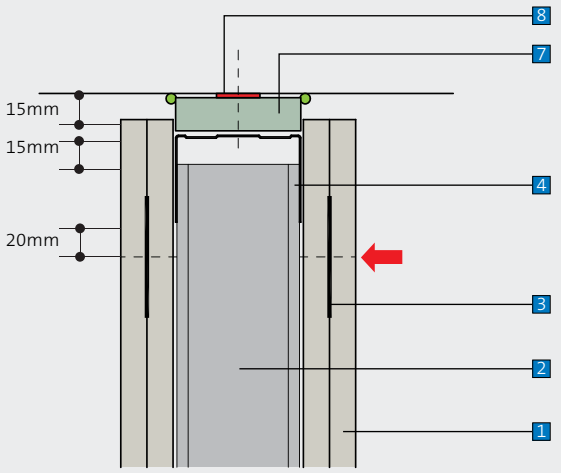
15 Gypframe Service Support Plate



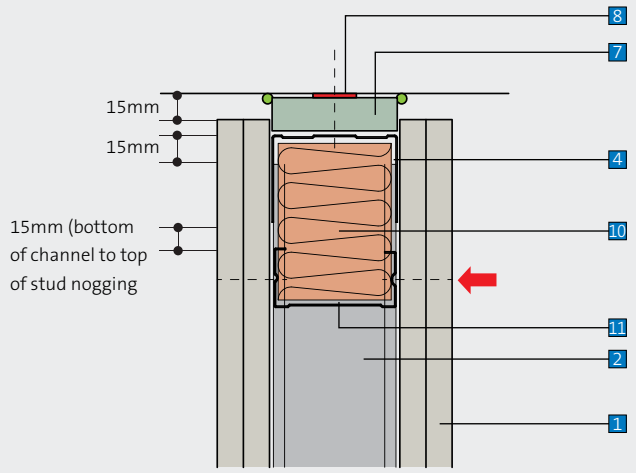
1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Stone mineral wool (minimum density 23kg/m³) (by others)
4 Control Joint
5 Gypframe 103 FC 50 Fixing Channel
6 Gypframe 103 FC 90 Fixing Channel
7 Gypframe Service Support Plate
8 18mm plywood

Construction details

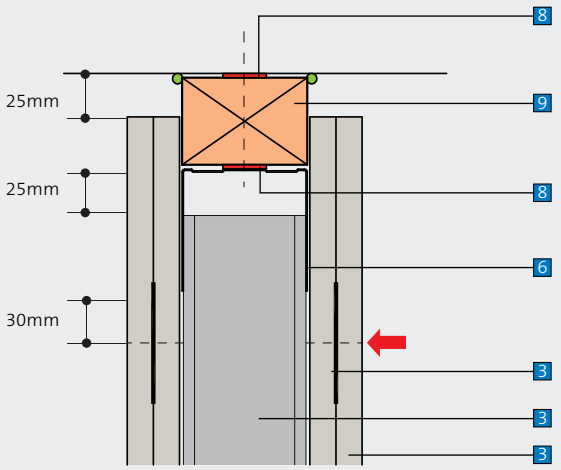
16 Deflection head for 15mm downward movement and 60 minutes fire resistance



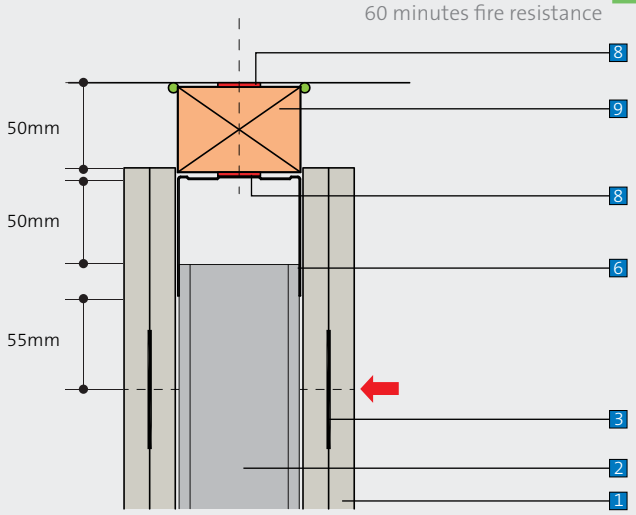
17 Deflection head for 15mm downward movement and up to 120 minutes fire resistance



18 Deflection head for plus or minus 25mm movement and 60 minutes fire resistance



19 Deflection head for 50mm downward movement and 60 minutes fire resistance

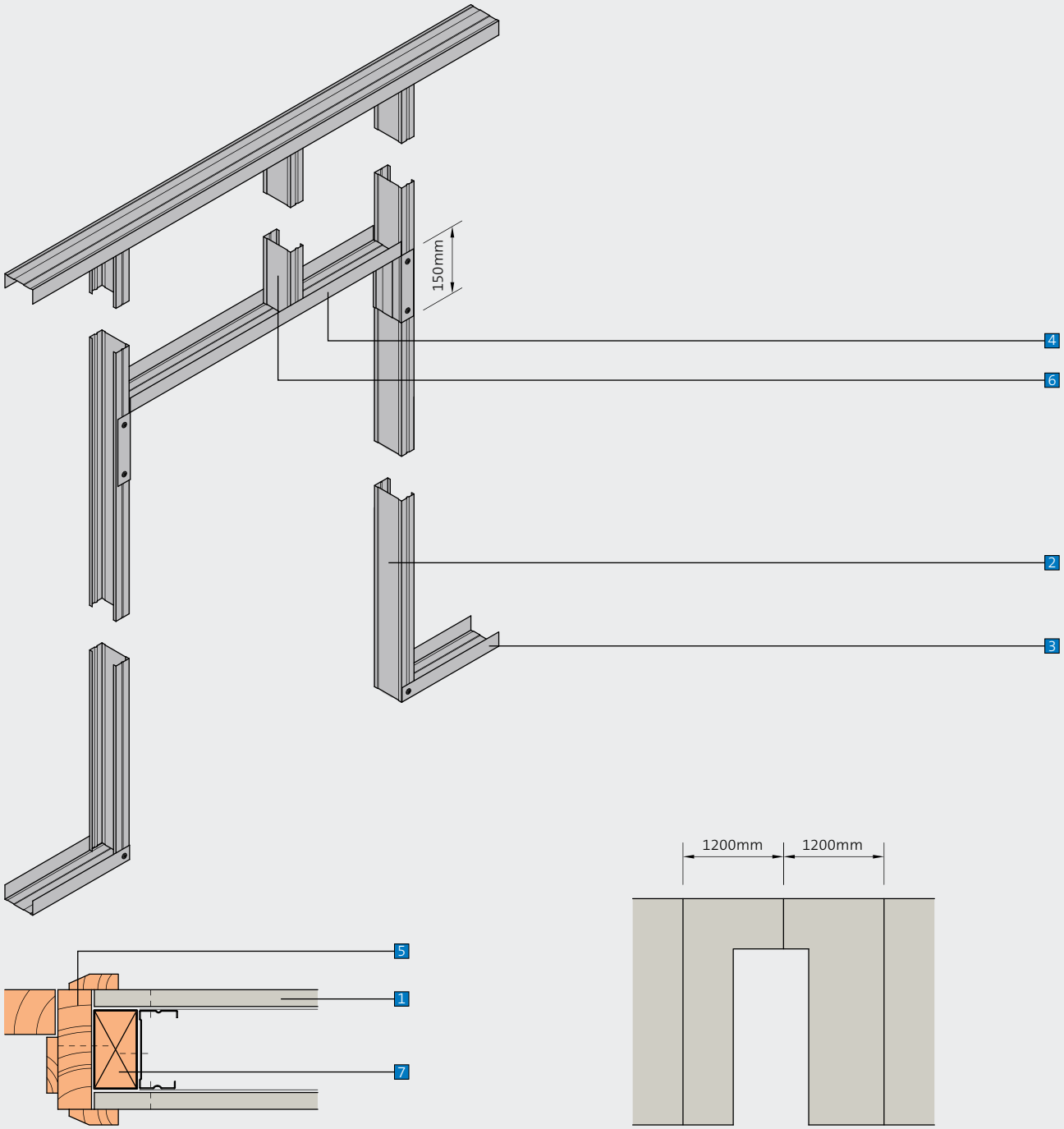


1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe GFS1 Fixing Strap
4 Gypframe Deep Flange Floor & Ceiling Channel suitably fixed through fire-stop to structure at 600mm
5 Gypframe Extra Deep Flange Floor & Ceiling Channel suitably fixed through fire-stop to structure at 600mm
6 Gypframe Extra Deep Flange Floor & Ceiling Channel fixed to timber head plate
7 Gyproc CoreBoard
8 Intumescent Firestrip (continuous) - by others
9 Timber head plate suitably fixed to structure
10 Stone mineral wool (minimum 33kg/m^3) retained by stud nogging (by others)
11 Nogging cut from Gypframe 'C' Stud

NB No fixings should be made through the boards into the flanges of the head channel. The arrow (←) denotes the position of the uppermost board fixing, which should be made into Gypframe GFS1 Fixing Strap (or stud nogging in Construction details - 16). Continuous Intumescent Firestrip must be installed as shown to maintain fire performance. Where there is a need for a deflection head in a 90 minute wall, the 120 minute solution can be used (refer to Construction details - 16) or alternatively, please contact the Gyproc Technical Team for further guidance.

Construction details

20 Door frame to satisfy BS 5234: Parts 1 & 2: 1992 - Light and Medium Duty

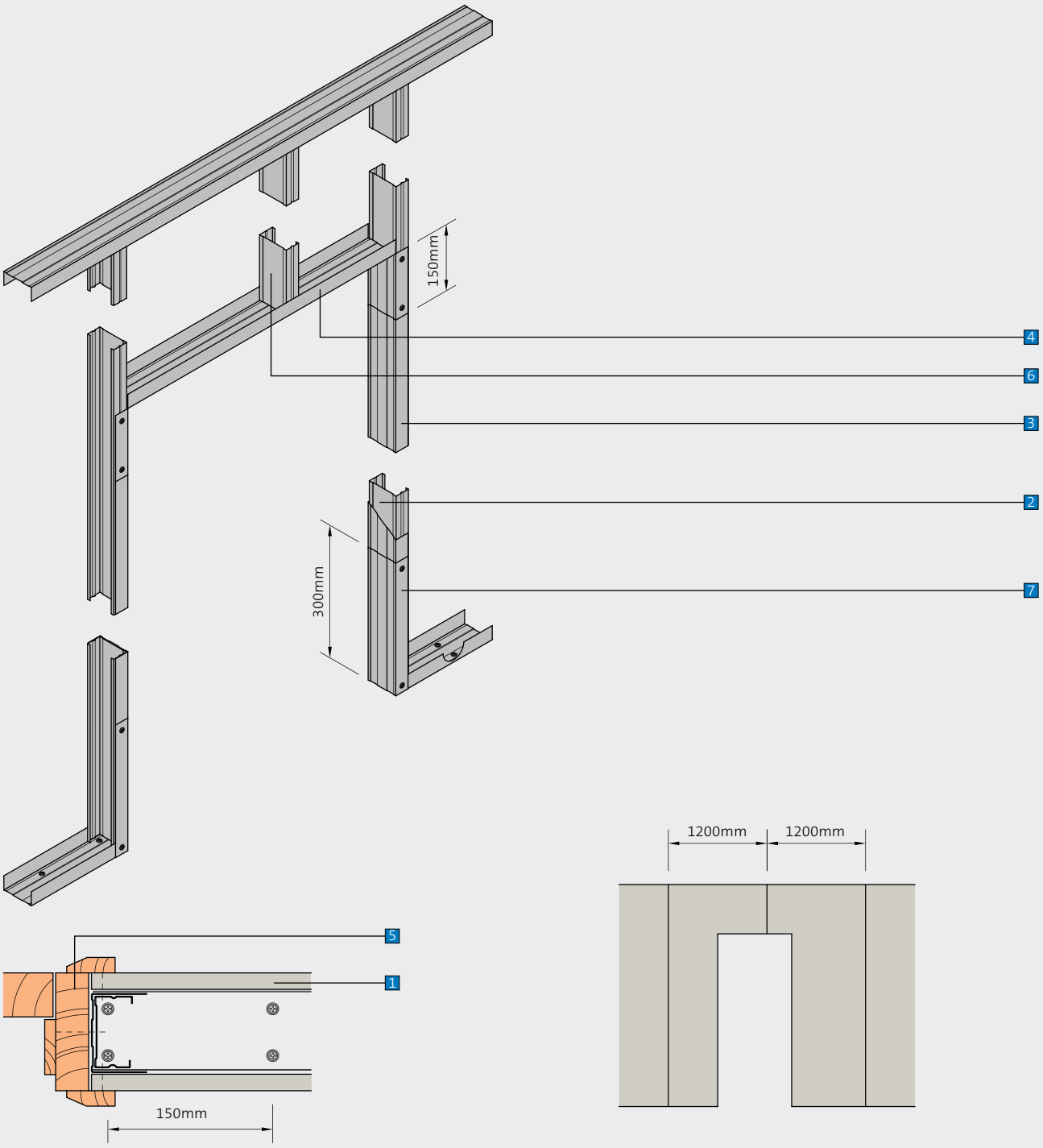


1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe Floor & Ceiling Channel
4 Gypframe Floor & Ceiling Channel cut and bent to form door head
5 Timber door frame and architrave
6 Gypframe 'C' Stud to maintain stud module
7 Timber sub-frame

NB Advice should be sought from the door manufacturer prior to the construction of these details.

Construction details

21 Door frame to satisfy BS 5234: Parts 1 & 2: 1992 - Heavy and Severe Duty



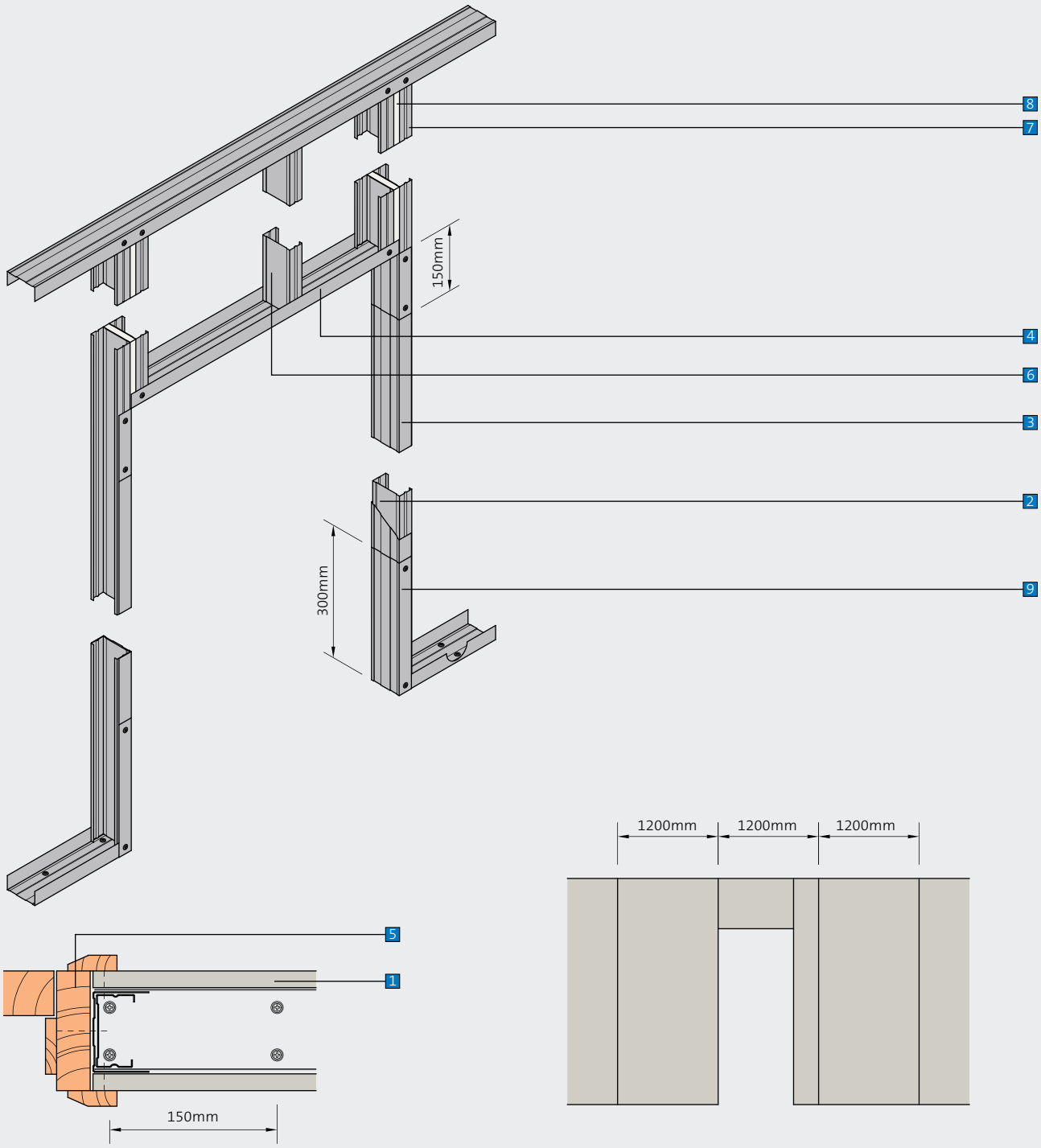
1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe Floor & Ceiling Channel to sleeve studs
4 Gypframe Floor & Ceiling Channel cut and bent to form door head
5 Timber door frame and architrave
6 Gypframe 'C' Stud to maintain stud module
7 Gypframe Floor & Ceiling Channel cut and bent to extend up studs

NB Advice should be sought from the door manufacturer prior to the construction of these details.

NB At the base, the channel is cut and bent to extend 300mm up the studs and fixed each side with two Gyproc Wafer Head Drywall Screws. The studs each side of the opening are sleeved full height of opening with Gypframe Floor & Ceiling Channel.

Construction details

22 Alternative 'reduced plasterboard waste' door frame detail to satisfy BS 5324: Parts 1 & 2: 1992 - Heavy and Severe Duty



1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe Floor & Ceiling Channel to sleeve studs
4 Gypframe Floor & Ceiling Channel cut and bent to form door head
5 Timber door frame and architrave
6 Gypframe 'C' Stud to maintain stud module
7 Gypframe 'C' Studs fixed back to back with Gyproc Drywall Screws at 300mm centres staggered
8 Plasterboard infill (same type as lining) cut to fit between studs
9 Gypframe Floor & Ceiling Channel cut and bent to extend up studs

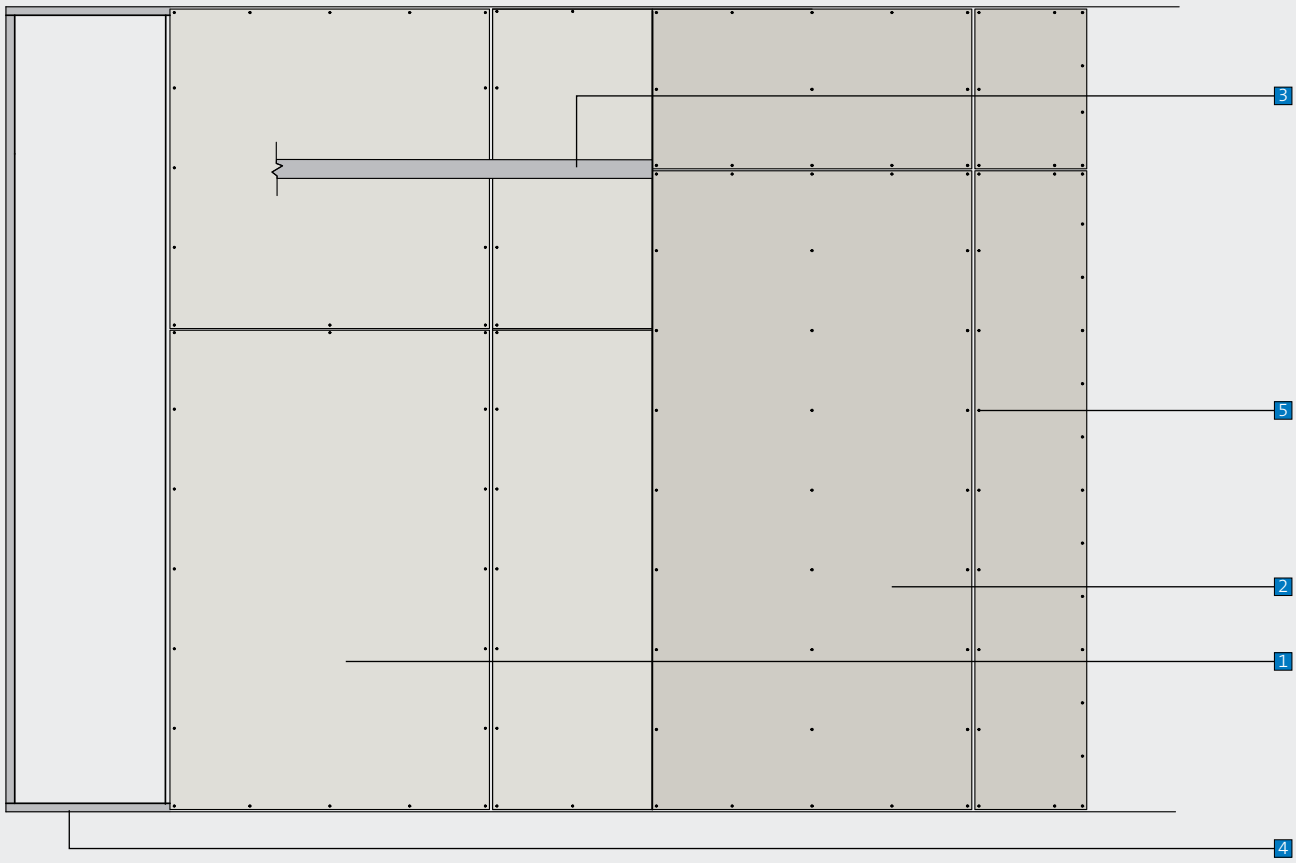
NB Advice should be sought from the door manufacturer prior to the construction of these details.

NB At the base, the channel is cut and bent to extend 300mm up the studs and fixed each side with two Gyproc Wafer Head Drywall Screws. The studs each side of the opening are sleeved full height of opening with Gypframe Floor & Ceiling Channel.

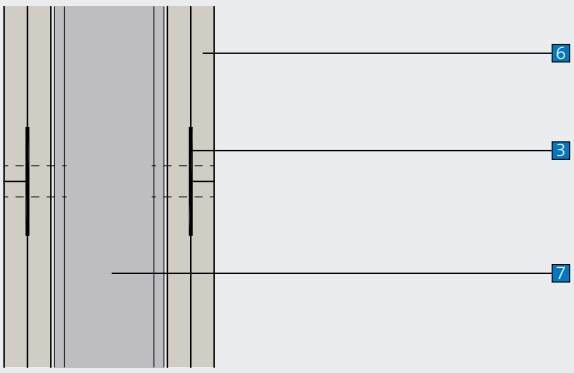
NB The principle of this alternative detail is only suitable for GypWall CLASSIC and GypWall ROBUST for fixed head situations only.

Construction details

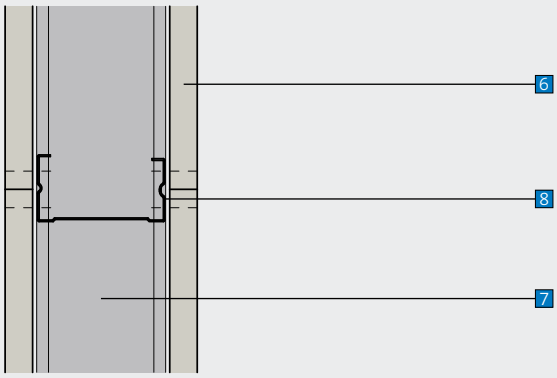
23 Board layout - typical configuration



24 Horizontal board joint - double layer



Horizontal board joint - single layer 25

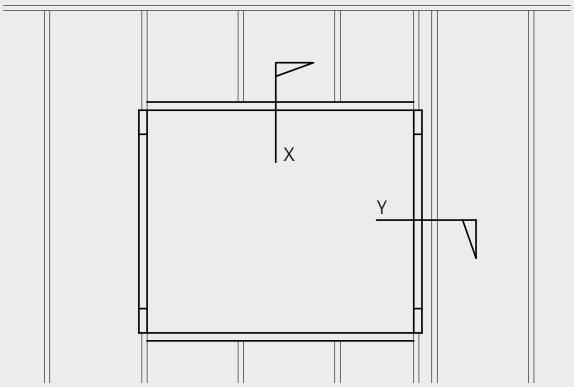


1 Inner layer of Gyproc plasterboard
2 Outer layer of Gyproc plasterboard
3 Gypframe GFS1 Fixing Strap
4 Gypframe metal framing
5 Gyproc Drywall Screws
6 Gyproc plasterboard
7 Gypframe 'C' Stud
8 Nogging cut from Gypframe 'C' Stud

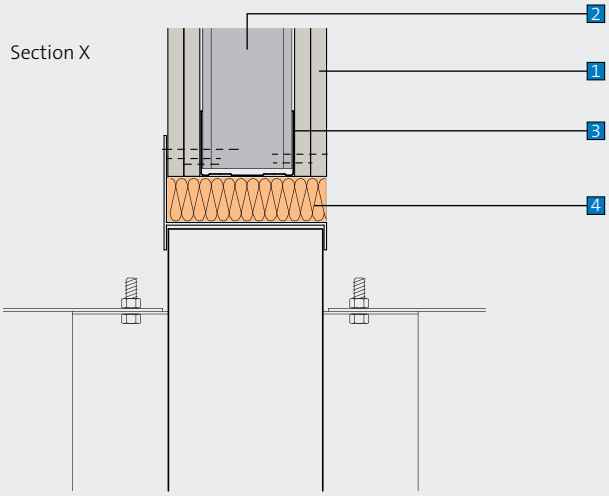
Construction details

26 Opening for service penetrations in fire-rated partitions

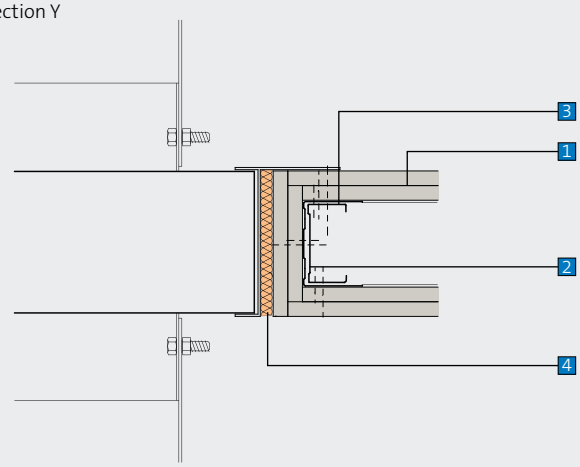
Elevation



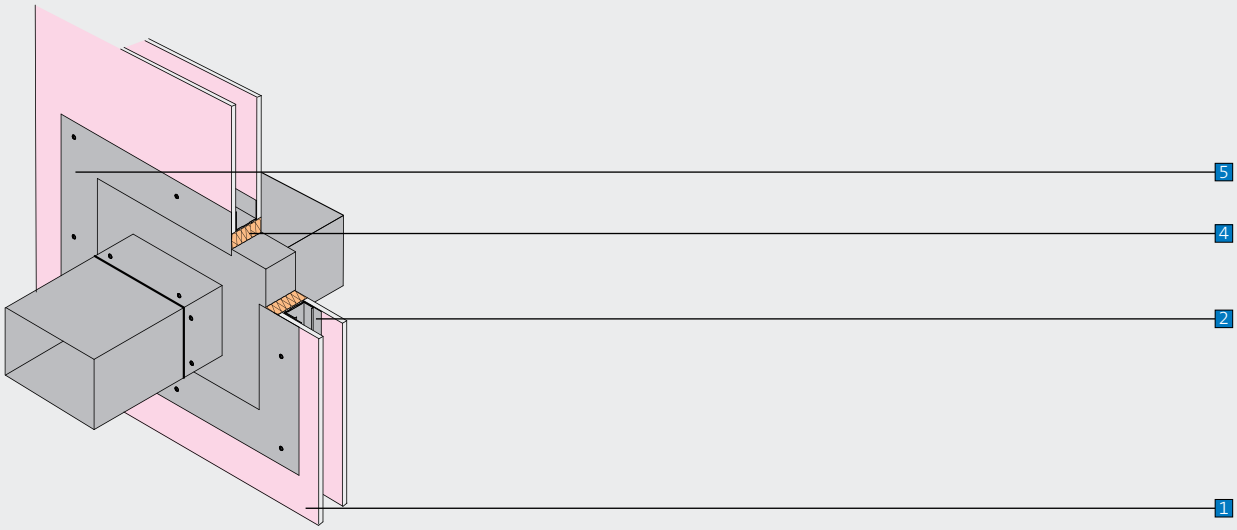
Section X



Section Y



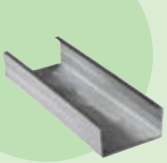
27 Fire tested construction in which the damper is supported by the partition (isometric view)



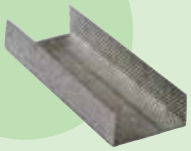
1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe Floor & Ceiling Channel
4 Penetration seal as tested by damper manufacturer or proprietary alternative, confirmed as compatible by system designer / specifier (Plasterboard lining around opening may not be required)
5 Damper (by others). Weight of damper should not exceed 57kg. Size of damper should not exceed 1400 x 1200mm

GypWall CURVE is a highly cost-effective system designed to provide curved walls and linings.
This system can be installed in all types of buildings to deliver design flexibility and aesthetic impact.

A
Gypframe
'C' Stud



B
Gypframe
Channel



Key facts

- Minimum radii 600mm
- Gypframe channel can be easily shaped to radius
- Choice of linings to suit performance requirements and to maintain continuity
- Boards can be jointed in the normal way

Applications

A wide range of applications, for example receptions, communal areas and atria.

Sector

- ✓ Office / commercial
- ✓ Retail
- ✓ Sport and leisure
- ✓ Education
- ✓ High-rise multi-occupancy
- ✓ Healthcare
- ✓ Auditoria

GypWall CURVE

System components

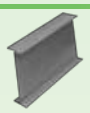
Gypframe metal products

50 S 50 'C' Stud — **Length** 3000mm

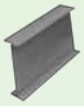
70 S 50 'C' Stud — **Length** 3000mm

100 S 50 'C' Stud — **Length** 3000mm

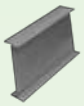
150 S 50 'C' Stud — **Length** 3000mm



70 I 70 'I' Stud — **Length** 3000mm



100 I 80 'I' Stud — **Length** 3000mm



150 I 90 'I' Stud — **Length** 3000mm

Floor & Ceiling Channels
Standard (C), Deep Flange Floor & Ceiling Channel (DC) and Extra Deep Flange Floor & Ceiling Channel (EDC). All channels are available in 3000mm.

103 FC 50 Fixing Channel — **Length** 3000mm

Board products

Gyproc Regular
Thickness 9, 12.5, 15mm
Width 1200mm

Gyproc FireStop[1]
Thickness 12.5, 15mm
Width 1200mm

Gyproc DuraLine[1]
Thickness 15mm
Width 1200mm

Glasroc F MULTIBOARD
Thickness 6, 10, 12.5mm
Width 1200mm

1 Moisture resistant (MR) versions of the above boards are specified in intermittent wet use areas, e.g. shower cubicles.

Fixing and finishing products

Gyproc Wafer Head Drywall Screws
For Gypframe metal-to-metal fixing less than 0.8mm thick.
or
Gyproc Wafer Head Jack-Point Screws
For Gypframe metal-to-metal fixing 0.8mm thick or greater

Gyproc Drywall Screws
For fixing boards to Gypframe metal framing less than 0.8mm thick.
or
Gyproc Jack-Point Screws
For fixing boards to Gypframe metal framing 0.8mm thick or greater.

Gyproc Jointing Compound
For seamless jointing.

Gyproc Paper Tape
For joint reinforcement.

Gyproc Fibre Tape
For joint reinforcement.

Insulation products

Isover Acoustic Partition Roll
For improved acoustic performance.

Eligible for the SpecSure warranty from Gyproc

Installation overview

Gypframe channel is snipped and bent to the required radius to acheive a smooth and un-faceted line, and suitably fixed to the floor and ceiling using two rows of fixings at 300m centres. Gypframe studs are fitted vertically within channel sections, and to abutments, to form the framework. Studs are fixed into the channel at both head and base and must all face the same way. If a deflection head is required, the studs should not be fixed into the head channel and alternative temporary support may be required to stabalise the stud at the head whilst boarding proceeds. Additional framing is installed as required to support heavy fixtures.

For single layer board linings, fix boards horizontally. Stagger board joints and avoid vertical joints occuring on the apex of the curve.

For double layer board linings, inner boards are fixed horizontally to all supports. Face layer boards are fixed horizontally with joints staggered in relation to the first layer. Vertical joints occuring on the apex of the curve in the face layer should be avoided. Additional studs may be required where multiple layers are specified to account for the difference that arises between inner and outer radii.

Services
Electrical and other services are normally installed after one side is boarded.

GypWall CURVE

Performance

Fire resistance
There is no specific standard against which to test curved walls and linings, but ad hoc testing has been carried out which confirms that a similar performance can be achieved to that claimed for the straight partition.

Impact resistance
Glasroc F MULTIBOARD offers a high degree of impact resistance. It also has excellent mechanical properties, is not brittle and therefore is not prone to cracking or shattering when handled.

Degree of curvature
In common with other sheet materials, board-ends have a tendency to remain straight. The minimum radius, therefore, will be influenced by the board characteristics, the length of curve, the support centres, and the occurrence of board joints.

Sound insulation
Reducing the centres of the metal studs within **GypWall CURVE** can have a detrimental effect on sound insulation. Include 25mm Isover APR in the cavity for improved acoustic performance.

Refer to – Principles of robust design.

Table 1 – Minimum bending radii and stud centres

Board type	Thickness mm	Minimum radius[1] mm	Stud centres mm[2]
Glasroc F MULTIBOARD	6	600	300
Gyproc Regular	9	1800	300
	12.5	3600	300
	15	4800	300
Gyproc FireStop	12.5	4800	300
	15	5700	400
Gyproc DuraLine	15	5700	400

1 Concave or convex.

2 For any radius 7000mm or more, studs can be installed at 600mm centres irrespective of board type with the exception of 6mm Glasroc F MULTIBOARD.

NB Double layer specifications can be used if required to meet specific performance criteria.

Design

Planning
The positioning of vertical board joints on exposed board layers at the apex of the curve should be avoided. The positioning of all studs, therefore, needs to be determined at the design stage. Where straight runs occur within curved partitions or linings, stud centres can be increased as determined by the specification.

Fixing floor and ceiling channels
Gypframe channels must be securely fixed in two rows of fixings at 300mm centres. If the floor is uneven, a 38mm thick timber sole plate equal to the width of the channel should be used.

If the concrete or screeded floor is new, consideration should be given to the installation of a damp-proof membrane between the floor surface and the channel or sole plate.

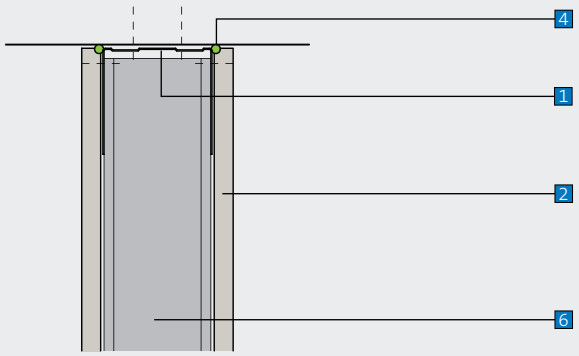
Cavity fire barriers
Minimum 12.5mm Gyproc plasterboard can be used to form a cavity closure within the partition to prevent the spread of fire or smoke.

Electrical
The installation of electrical services should be carried out in accordance with the relevant controlling authority and / or procedures. The cut-outs in the studs can be used for routing electrical and other small services (see **GypWall CLASSIC Construction details – 1**). Switch boxes and socket outlets can be supported from stud noggings or Gypframe Fixing Channels fixed horizontally between studs, or a high performance socket box detail where higher acoustic performance is required.

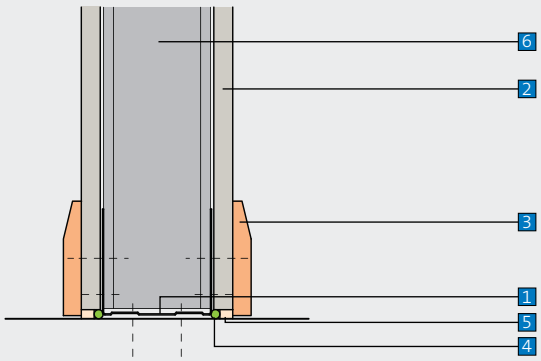
Cables should be protected by conduit, or other suitable precautions taken to prevent abrasion when they pass through the metal frame.

Construction details

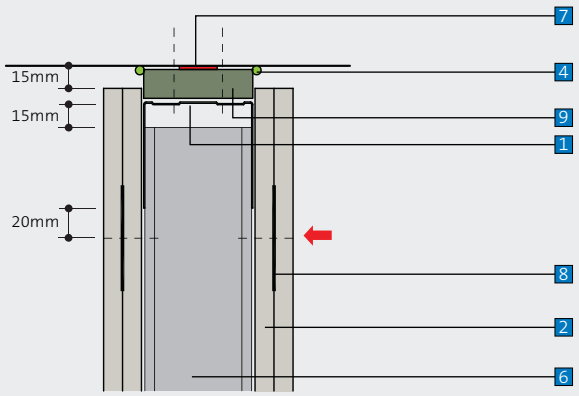
1 Head



Base 2



3 Deflection head for 15mm downward movement and 60 minutes fire resistance



1 Gypframe Channel
2 Gyproc plasterboard or Glasroc F MULTIBOARD
3 Skirting
4 Sealant by others
5 Bulk fill with Gyproc jointing materials (where gap exceeds 5mm)
6 Gypframe 'C' Stud
7 Intumescent Firestrip by others
8 Gypframe GFS1 Fixing Strap
9 Gyproc CoreBoard cut to required curve

NB No board fixings should be made into the head channel. The arrow (←) denotes the uppermost board fixing, which should be made into Gypframe GFS1 Fixing Strap. Continuous Intumescent Firestrip must be installed as shown to maintain fire performance.

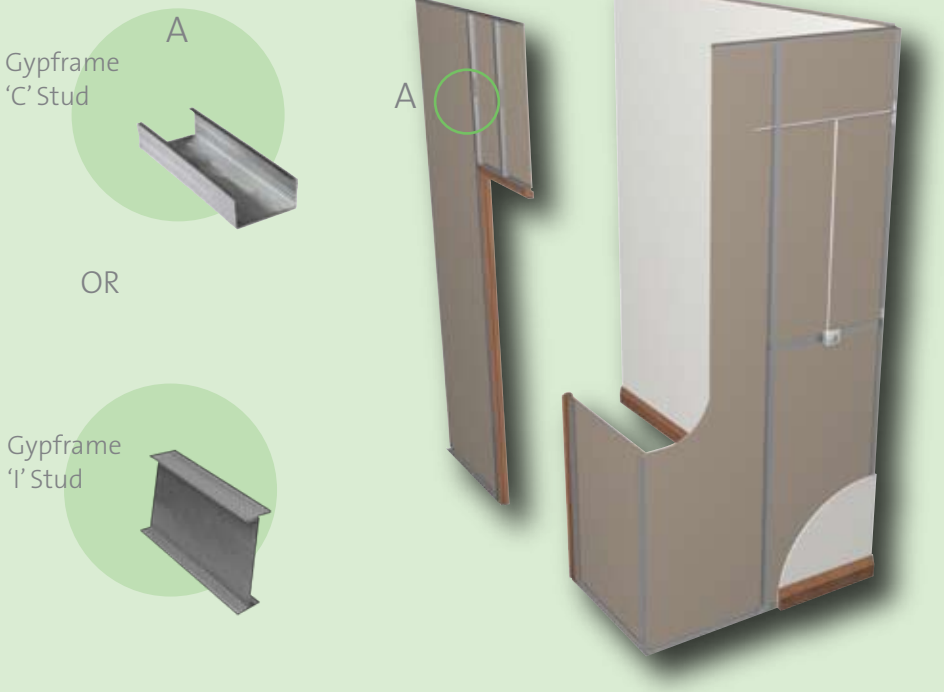
GypWall ROBUST

Durable impact resistant partition system

GypWall ROBUST

42 – 51 R_w dB | 60 mins

GypWall ROBUST is a high impact-resistant partition system for use where a more durable structure is required. It provides a lightweight, cost-effective, non-loadbearing partition suitable for all types of commercial, healthcare and educational buildings.



Key facts

In addition to the benefits of **GypWall CLASSIC**:

- High impact resistance
- Satisfies BS 5234 requirements to Severe Duty[1] in a single layer
- Single layer 60 minutes fire resistance
- Available in 70mm, 100mm and 150mm stud options also available
- Accommodates services within the stud cavity
- Achieves high levels of sound insulation with single layer

1 Refer to - Principles of robust design.

Applications

Major circulation areas, for example corridors and stairwells.

Sector

✓ Sport and leisure ✓ Education ✓ Healthcare

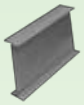
✓ Industrial ✓ Custodial ✓ High-rise multi-occupancy

GypWall ROBUST

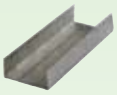
System components

Gypframe metal products

70 S 60'C' Stud — **Length** 3000mm



70 I 70'I' Stud — **Length** 3000mm



Deep Flange Floor & Ceiling Channel
72 DC 60
Extra Deep Flange Floor & Ceiling Channel
72 EDC 80
All channels are available in 3000mm.

GFS1 Fixing Strap — **Length** 2400mm

Board products

Gyproc DuraLine[1]
Thickness 15mm
Width 1200mm

1 Moisture resistant (MR) version of the above board is specified in intermittent wet use areas, e.g. shower cubicles.

Fixing and finishing products

Gyproc Wafer Head Drywall Screws
For Gypframe metal-to-metal fixing less than 0.8mm thick.
or

Gyproc Wafer Head Jack-Point Screws
For Gypframe metal-to-metal fixing 0.8mm thick or greater

Gyproc Drywall Screws
For fixing boards to Gypframe metal framing less than 0.8mm thick.
or

Gyproc Jack-Point Screws
For fixing boards to Gypframe metal framing 0.8mm thick or greater.

Gyproc Jointing Compound
For seamless jointing.

Gyproc Paper Tape
For joint reinforcement.

Gyproc Fibre Tape
For joint reinforcement.

Insulation products

Isover Acoustic Partition Roll
25mm, 50mm and 75mm for improved acoustic performance.

Eligible for the SpecSure warranty from Gyproc

Installation overview

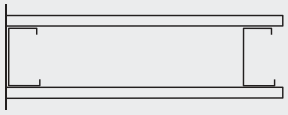
Gypframe Deep Flange Floor & Ceiling Channel is fixed to the floor and soffit. Gypframe studs are fitted vertically to a friction-fit at 600mm centres within the channel sections, and to abutments, to form the framework. This allows for adjustment during boarding. Gypframe 'C' Studs are fitted so as to all face the same way. Additional framing is installed as required to support heavy fixtures.

Gyproc DuraLine boards are screw-fixed to framing members to form the lining. Horizontal board-end joints should be backed with stud nogging off-cut or Gypframe GFS1 Fixing Strap.

Services
Electrical and other services are normally installed after one side is boarded. Horizontal runs are routed through cut-outs in the studs. Gypframe 103 FC 50 fixing channel can be installed between studs to support recessed switch boxes / socket outlets.

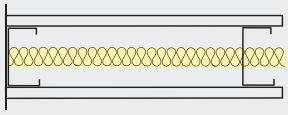
Table 1 – GypWall ROBUST 70mm Gypframe 'C' Studs - single layer board linings Solutions to satisfy the requirements of BS 476: Part 22: 1987

1



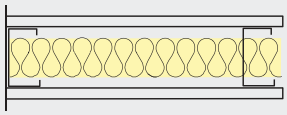
One layer of board each side of Gypframe 70 S 60 'C' Studs at 600mm centres. Linings as in table.

2



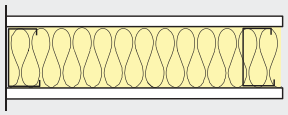
One layer of board each side of Gypframe 70 S 60 'C' Studs at 600mm centres. 25mm Isover APR 1200 in the cavity Linings as in table.

3



One layer of board each side of Gypframe 70 S 60 'C' Studs at 600mm centres. 50mm Isover APR 1200 in the cavity. Linings as in table

4



One layer of board each side of Gypframe 70 S 60 'C' Studs at 600mm centres. 75mm Isover APR 2000 in the cavity. Linings as in table

Detail	Partition thickness mm	Board type	Lining thickness mm	Maximum partition height[1] mm	Sound insulation R_w db	Duty rating	Approx. weight kg/m²	System reference
	60 minutes fire resistance BS							
1	102	DuraLine	1 x 15	4000	42	Severe	29	Q606043
2	102	DuraLine	1 x 15	4000	47	Severe	29	Q606044
3	102	DuraLine	1 x 15	4000	48	Severe	29	Q606045
4	102	DuraLine	1 x 15	4000	51	Severe	29	Q606048

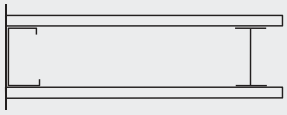
1 Based on a limiting deflection of L/240 at 200 Pa. Greater heights can be achieved through the use of reduced stud centres. Refer to Principles of robust design.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

NB For heights between 4200mm and 8000mm, Gypframe Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

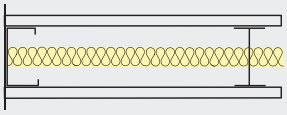
Table 2 – GypWall ROBUST 70mm Gypframe 'I' Studs - single layer board linings Solutions to satisfy the requirements of BS 476: Part 22: 1987

1



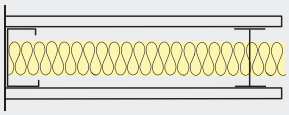
One layer of board each side of Gypframe 70 I 70 'I' Studs at 600mm centres. Linings as in table.

2



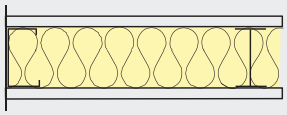
One layer of board each side of Gypframe 70 I 70 'I' Studs at 600mm centres. 25mm Isover APR 1200 in the cavity. Linings as in table.

3



One layer of board each side of Gypframe 70 I 70 'I' Studs at 600mm centres. 50mm Isover APR 1200 in the cavity. Linings as in table.

4



One layer of board each side of Gypframe 70 I 70 'I' Studs at 600mm centres. 75mm Isover APR 2000 in the cavity. Linings as in table.

Detail	Partition thickness mm	Board type	Lining thickness mm	Maximum partition height[1] mm	Sound insulation R_w db	Partition duty	Approx. weight kg/m²	System reference
	60 minutes fire resistance BS							
1	102	DuraLine	1 x 15	4700	42	Severe	29	Q606049
2	102	DuraLine	1 x 15	4700	47	Severe	29	Q606050
3	102	DuraLine	1 x 15	4700	48	Severe	29	Q606051
4	102	DuraLine	1 x 15	4700	51	Severe	29	Q606048

1 Based on a limiting deflection of L/240 at 200 Pa. Greater heights can be achieved through the use of reduced stud centres. Refer to Principles of robust design.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc's recommendations. The quoted performances are achieved only if Gyproc's components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc's.

NB For heights between 4200mm and 8000mm, Gypframe Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

Design

Services
The position of services and heavy fixtures should be pre-determined and their installation planned into the frame erection stage. Timber sole plates should be considered where the floor is uneven.

Cavity fire barriers
Minimum 12.5mm Gyproc plasterboard screw-fixed into the web of perimeter channels or vertical studs will provide a satisfactory closure to flame or smoke.

Independent support
When designing for the installation of services such as fire dampers and associated ductwork through a GypWall partition, consideration should be given to the size and weight of the damper - this will determine whether it can be supported directly from the partition or needs to be independently supported from the structure.

Refer to – Service installations.

Electrical
The installation of electrical services should be carried out in accordance with the relevant controlling authority and / or procedures. The cut-outs in the studs can be used for routing electrical and other small services (see **GypWall CLASSIC Construction details – 1**). Switch boxes and socket outlets can be supported from stud noggings or Gypframe 103 FC 50 Fixing Channels fixed horizontally between studs, or a high performance socket box detail where higher acoustic performance is required.

Cables hould be protected by conduit, or other suitable precautions taken to prevent abrasion when they pass through the metal frame.

Fixing floor and ceiling channels
Gypframe Floor & Ceiling Channels must be securely fixed with a row of fixings at 600mm maximum centres. For 102mm channels and above, two rows of staggered fixings are required, each row at 600mm centres and each fixing 25mm in from the flange. If the floor is uneven, a 38mm thick timber sole plate equal to the width of the channel should be used.

If the concrete or screeded floor is new, consideration should be given to the installation of a damp-proof membrane between the floor surface and the channel or sole plate.

Door openings
The designer should consider the thickness tolerances of the partition types in relation to the proposed door frame detail. To satisfy BS 5234: Part 2 requirements for Heavy and Severe Duty partitions, door framing should be specified as shown in **Construction details – 6 - 7**. The door manufacturer should also be consulted in relation to the door detail.

Control joints
Control joints may be required in the partition to relieve stresses induced by expansion and contraction of the structure. They should coincide with movement joints within the surrounding structure.

Deflection heads
Partition head deflection designs may be necessary to accommodate deflections in the supporting floor. Deflection heads may also be required to the underside of roof structures subjected to positive and negative pressures.

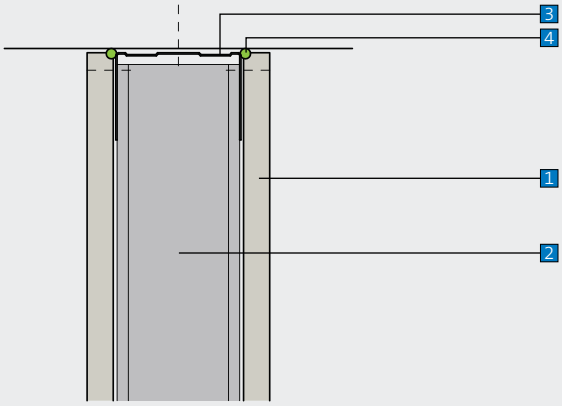
For deflection head design:

Refer to Partition and wall systems, **GypWall CLASSIC Construction details.**

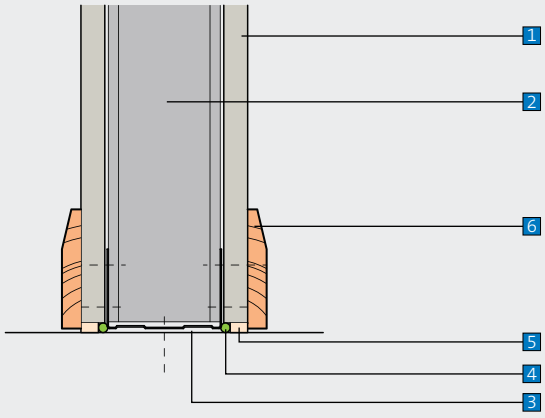
Access for maintenance
Gyproc Access Panels are available to provide access for maintenance. Access panels must be fully compatible with drywall construction and match the fire rating of the partition.

Construction details

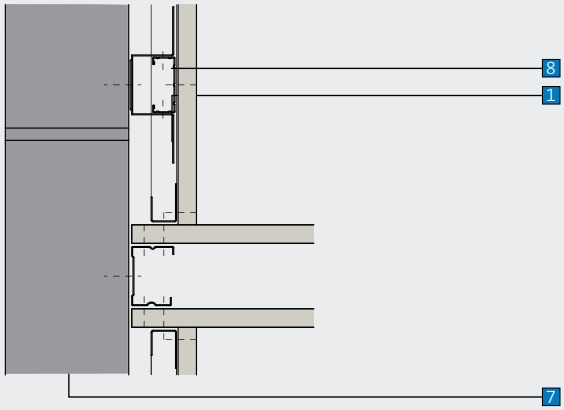
1 Head



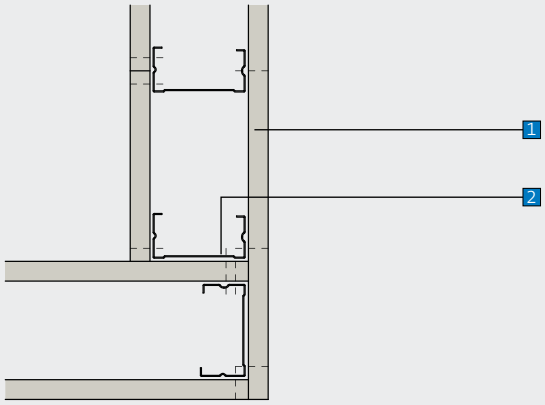
Base 2



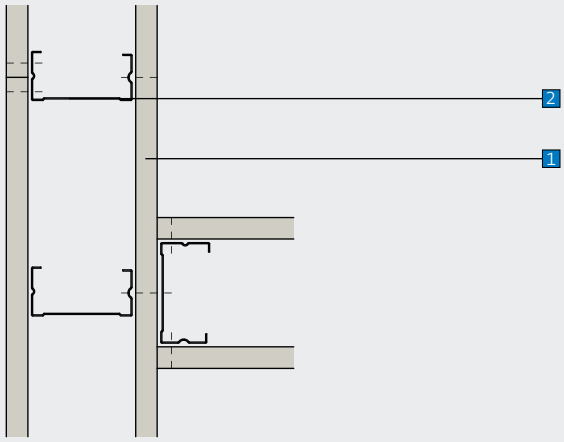
3 Junction with masonry and stop end detail



Internal / external corner 4



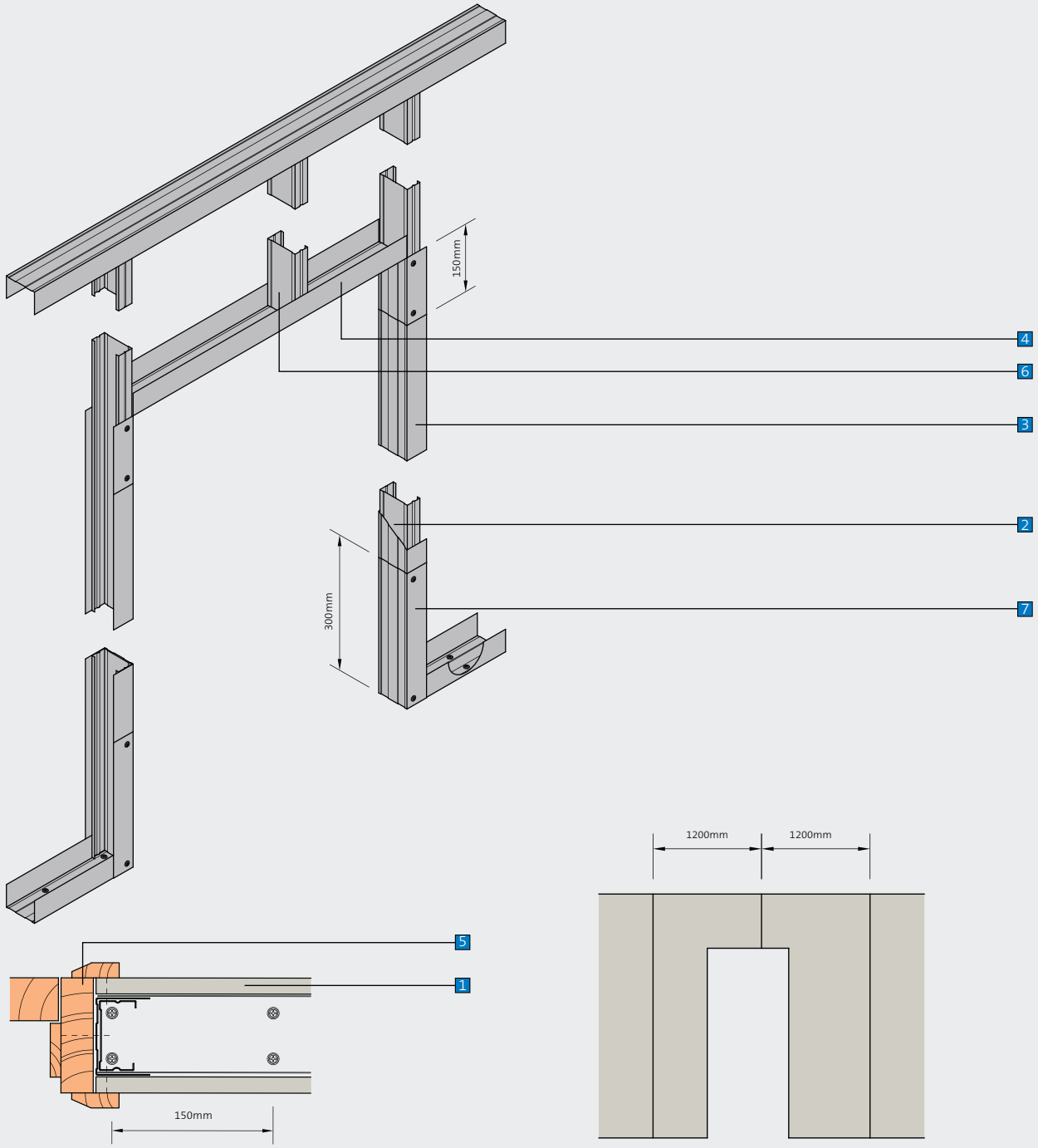
5 'T' junction



1 Gyproc DuraLine
2 Gypframe 'C' Stud
3 Gypframe Deep Flange Floor & Ceiling Channel
4 Sealant by others
5 Bulk fill with Gyproc jointing materials (where gap exceeds 5mm)
6 Skirting
7 Internal blockwork
8 GypLyner wall lining system

Construction details

6 Door frame to satisfy BS 5234: Parts 1 & 2: 1992 - Heavy and Severe Duty



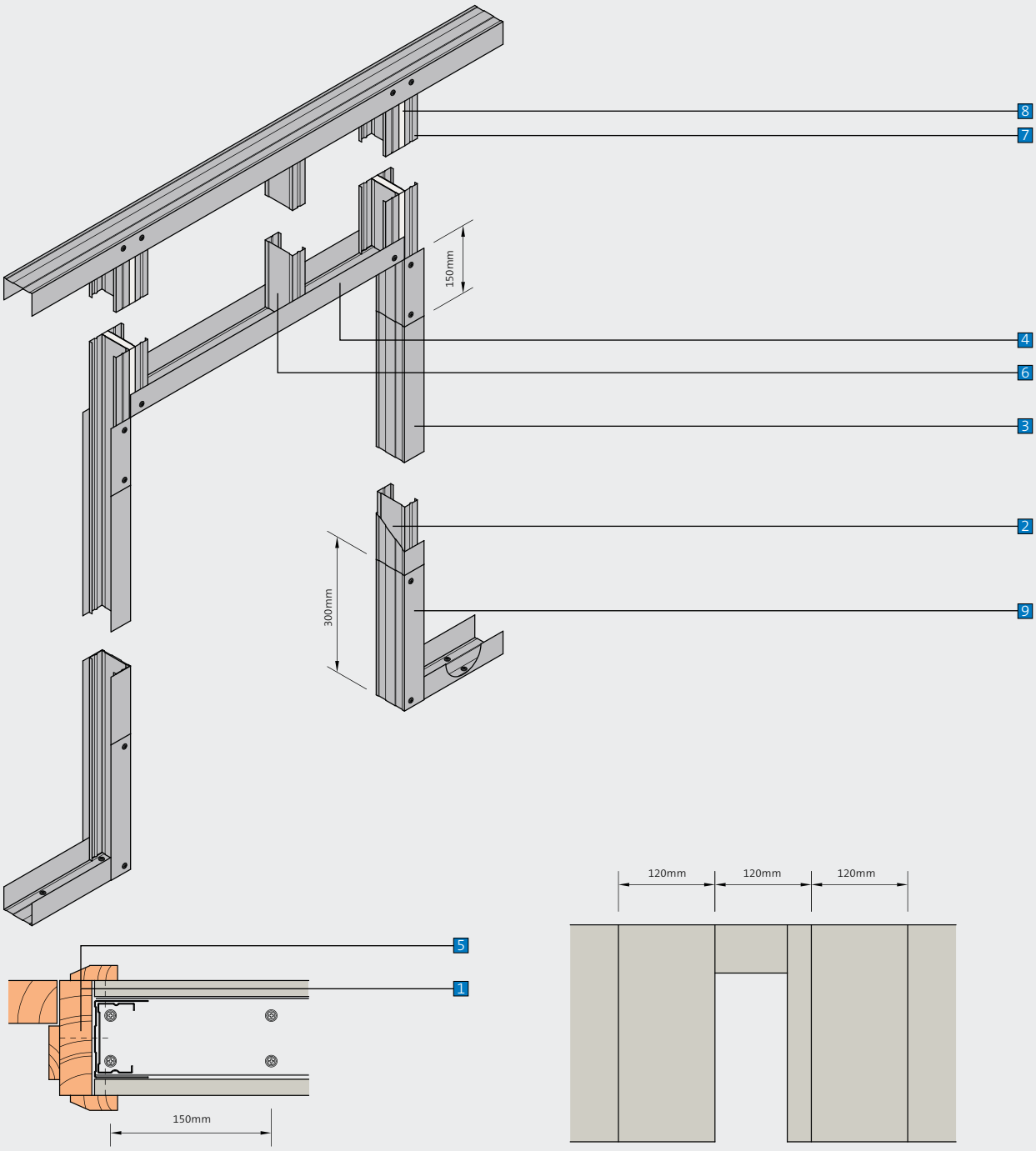
1 Gyproc DuraLine
2 Gypframe 'C' Stud
3 Gypframe Deep Flange Floor & Ceiling Channel to sleeve studs
4 Gypframe Deep Flange Floor & Ceiling Channel cut and bent to form door head
5 Timber door frame and architrave
6 Gypframe 'C' Stud to maintain stud module
7 Gypframe Deep Flange Floor & Ceiling Channel cut and bent to extend up studs

NB Advice should be sought from the door manufacturer prior to the construction of these details.

NB At the base, the channel is cut and bent to extend 300mm up the studs and fixed each side with two Gyproc Wafer Head Drywall Screws. The studs each side of the opening are sleeved full height of opening with Gypframe Deep Flange Floor & Ceiling Channel.

Construction details

7 Alternative reduced plasterboard waste door frame detail to satisfy BS 5234: Parts 1 & 2: 1992 - Heavy and Severe Duty



1 Gyproc DuraLine
2 Gypframe 'C' Stud
3 Gypframe Deep Flange Floor & Ceiling Channel to sleeve studs
4 Gypframe Deep Flange Floor & Ceiling Channel cut and bent to form door head
5 Timber door frame and architrave
6 Gypframe 'C' Stud to maintain stud module
7 Gypframe 'C' Studs fixed back to back with Gyproc Drywall Screws at 300mm centres staggered
8 Plasterboard infill (same type as lining) cut to fit between studs
9 Gypframe Deep Flange Floor & Ceiling Channel cut and bent to extend up studs

NB Advice should be sought from the door manufacturer prior to the construction of these details.

NB At the base, the channel is cut and bent to extend 300mm up the studs and fixed each side with two Gyproc Wafer Head Drywall Screws. The studs each side of the opening are sleeved full height of opening with Gypframe Deep Flange Floor & Ceiling Channel.

NB The principle of this reduced plasterboard waste door detail is only suitable for GypWall CLASSIC and GypWall ROBUST for fixed head situations only.

GypWall QUIET

Acoustic separating wall system

GypWall QUIET

61 – 63 R_w dB 60 – 120 mins

GypWall QUIET is a lightweight, non-loadbearing, twin framed acoustic separating wall, primarily used as a sound resisting wall in residential units such as flats and apartments. The system can also be specified in commercial and industrial buildings to meet a specific level of sound insulation performance.

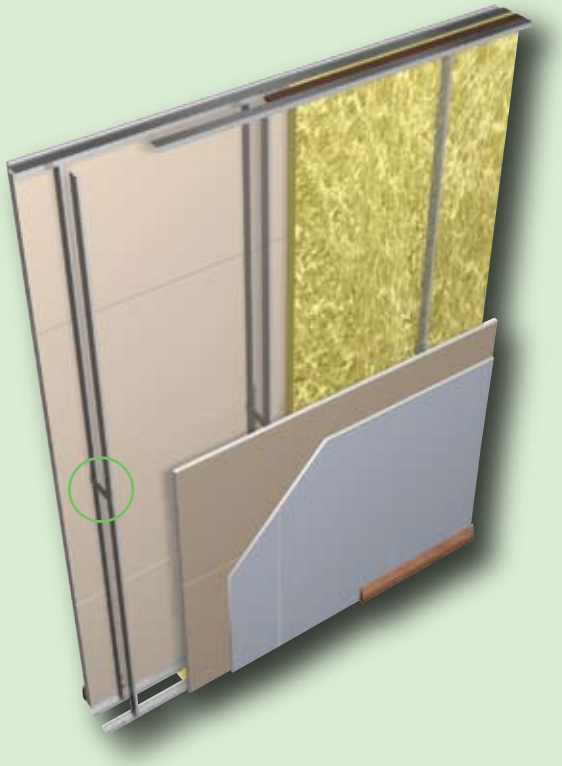
Gypframe
'C' Stud

+

Gypframe
103 FC 50

+

Gypframe
'C' Stud



Key facts

- Provides sound insulation solutions between residential dwellings
- Accommodates services between the twin stud frameworks
- Satisfies BS 5234 requirements up to and including Severe Duty[1]
- Accommodates concrete or steel columns within the cavity

1 Refer to Principles of robust design.

Applications

A wide range of applications, primarily used in flats and apartments.

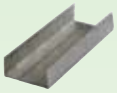
Sector

✓ Education
✓ Healthcare
✓ High-rise multi-occupancy
✓ Apartment buildings

System components

Gypframe metal products

50 S 50'C' Stud — **Length** 3000mm



Standard Floor & Ceiling Channel
52 C 50
Deep Flange Floor & Ceiling Channel
52 DC 60
Extra Deep Flange Floor & Ceiling Channel
52 EDC 80
All channels are available in 3000mm.

103 FC 50 Fixing Channel — **Length** 3000mm

Board products

Gyproc Regular[1]
Thickness 12.5, 15mm
Width 1200mm

Gyproc FireStop[1]
Thickness 15mm
Width 1200mm

1 Moisture resistant (MR) versions of the above boards are specified in intermittent wet use areas, e.g. shower cubicles.

Fixing and finishing products

Gyproc Wafer Head Drywall Screws
For Gypframe metal-to-metal fixing less than 0.8mm thick.
or

Gyproc Wafer Head Jack-Point Screws
For Gypframe metal-to-metal fixing 0.8mm thick or greater

Gyproc Drywall Screws
For fixing boards to Gypframe metal framing less than 0.8mm thick.
or

Gyproc Jack-Point Screws
For fixing boards to Gypframe metal framing 0.8mm thick or greater.

Gyproc Jointing Compound
For seamless jointing.

Gyproc Paper Tape
For joint reinforcement.

Gyproc Fibre Tape
For joint reinforcement.

Insulation products

Isover Acoustic Partition Roll
25mm, 50mm and 75mm for improved acoustic performance.

Eligible for the SpecSure warranty from Gyproc

Installation overview

Gypframe Floor & Ceiling Channels are fixed to the floor and soffit to achieve the specified wall thickness. Gypframe 'C' Studs are fitted vertically to a friction-fit within the channel sections, and to abutments, to form the framework. This allows for adjustment during boarding. Studs are fitted to face the same way and extended by splicing to the specified height.

The frameworks are braced using Gypframe 103 FC 50 Fixing Channel at 1200mm maximum centres, or mid-height for walls less than 2400mm high. Additional framing is installed as required to support heavy fixtures. The specified Isover insulation is installed between frameworks. Sealant is applied to the framework perimeters to seal airpaths.

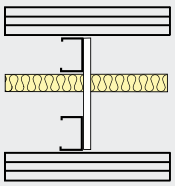
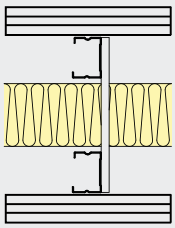
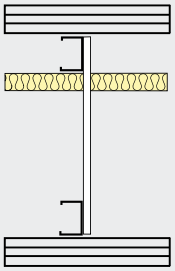
Boards are screw-fixed to framing members to form the lining. Horizontal board-end joints should be backed with Gypframe GFS1 Fixing Strap.

Openings
Openings must be constructed with care to maintain the acoustic performance. Specialist heavy acoustic door sets may be required.

Services
Electrical and other services are normally installed after one side is boarded. Horizontal runs are routed through cut-outs in the studs. Gypframe 103 FC 50 Fixing Channel is installed between studs to support recessed switch boxes / socket outlets, or a high performance socket box detail used where higher acoustic performance is required.

Performance (▸Refer to **Basic principles of system design**)

Table 1b – GypWall QUIET 50mm Gypframe 'C' Studs with cross braces. Solutions to satisfy the requirements of BS 476: Part 22: 1987

1	2	3
		
Two Gypframe 'C' Stud frameworks braced at max. 1200mm centres. Studs at 600mm centres. Isover APR in the cavity. Linings and insulation as in table.	Two Gypframe 'C' Stud frameworks braced at max. 1200mm centres. Studs at 600mm centres. Isover APR in the cavity. Linings and insulation as in table.	Two Gypframe 'C' Stud frameworks braced at max. 1200mm centres. Studs at 600mm centres. Isover APR in the cavity. Linings and insulation as in table.

Detail	Partition thickness[1] mm	Board type	Lining thickness mm	Maximum partition height[2] mm	Insulation thickness mm	Sound insulation R_w (R_w + Ctr) db	Partition duty	Approx. weight kg/m²	System reference
	90 minutes fire resistance BS								
1	200	Regular	3 x 12.5	7500	50	62 (56)	Severe	55	A216009
2	250	Regular	3 x 12.5	7500	75	63 (57)	Severe	55	A216011
3	300	Regular	3 x 12.5	7500	25	63 (57)	Severe	55	A216008
	120 minutes fire resistance BS								
1	200	FireStop	2 x 15	7500	50	60 (53)	Severe	52	A216010

1 Increasing cavity width improves acoustic performance, especially at low frequencies (Rw + Ctr).
2 Based on a limiting deflection of L/240 at 200 Pa.

NB For heights above 4200mm Gypframe Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled according to Gyproc's recommendations. The quoted performances are achieved only if Gyproc & Gypframe components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

Design

Planning - key factors
The position of services and heavy fixtures should be pre-determined and their installation planned into the frame erection stage. All penetrations will need to be adequately stopped for fire and acoustics.

Cross-bracing
The Gypframe 'C' Stud frameworks must be braced using short lengths of Gypframe 103 FC 50 Fixing Channel. Braces should be installed at 1200mm maximum centres, or at mid-height for walls less than 2400mm high. Braces must be fixed using two Gyproc Wafer Head Drywall Screws into each Gypframe 'C' Stud.

Cavity fire barriers
Stone mineral wool cut neatly to fit across the cavity forms a suitable closure.

Services
Penetrations
Penetrations of fire-resistant or sound-insulating constructions for services need careful consideration to ensure that the performance of the element is not downgraded and also that the services themselves do not act as the mechanism of fire spread or sound transmission.

Refer to **Service installations**.

Electrical
The installation of electrical services should be carried out in accordance with BS 7671. The cut-outs in the studs can be used for routing electrical and other small services (see **GypWall CLASSIC Construction details – 1**). Switch boxes and socket outlets can be supported from Gypframe 103 FC 50 Fixing Channel fixed horizontally between studs, or a high performance socket box detail where higher acoustic performance is required.

Cables should be protected by conduit, or other suitable precautions taken to prevent abrasion when they pass through the metal frame.

Refer to **Service installations.**

Fixing floor and ceiling channels
Gypframe Floor & Ceiling Channels must be securely fixed with a row of fixings at 600mm maximum centres. For 102mm channels and above, two rows of staggered fixings are required, each row at 600mm centres and each fixing 25mm in from the flange. If the floor is uneven, a 38mm thick timber sole plate equal to the width of the channel should be used.

If the concrete or screeded floor is new, consideration should be given to the installation of a damp-proof membrane between the floor surface and the channel or sole plate.

Deflection heads
Partition head deflection designs may be necessary to accommodate deflections in the supporting floor. Deflection heads may also be required to the underside of roof structures subjected to positive and negative pressures.

For special detailing which minimises the loss of acoustic performance:

Refer to **Principles of building acoustics.**

For deflection head design:

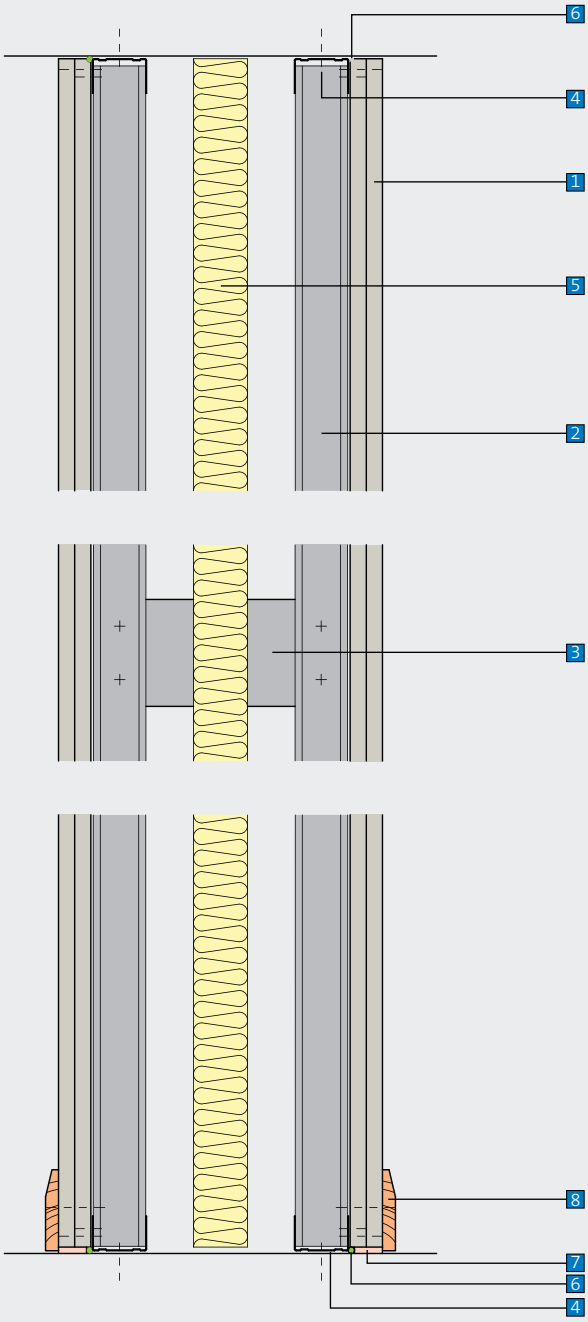
Refer to **Partition and wall systems, GypWall CLASSIC Construction details.**

Fixtures
Lightweight fixtures can be made directly to the partitions. Medium weight fixtures can be made to Gypframe 103 FC 50 Fixing Channel. Heavyweight fixtures (to BS 5234), such as wash basins and wall cupboards, can be fixed using Gypframe 103 FC 50 Fixing Channel.

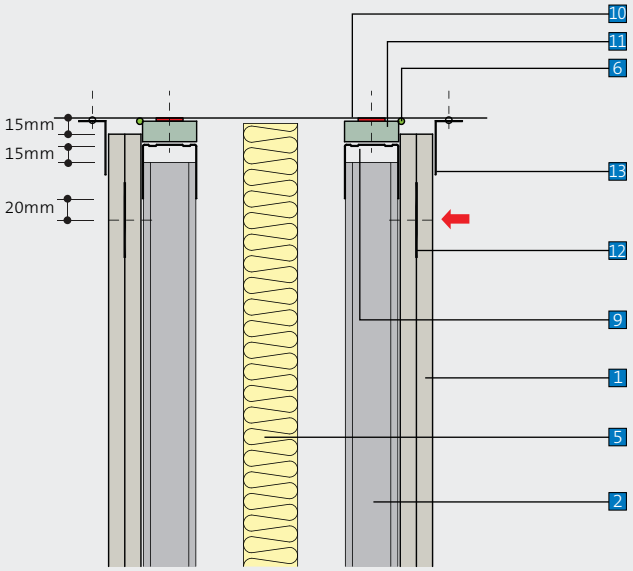
Refer to **Service penetrations and fixing into drywall systems.**

Construction details

1 Head and base



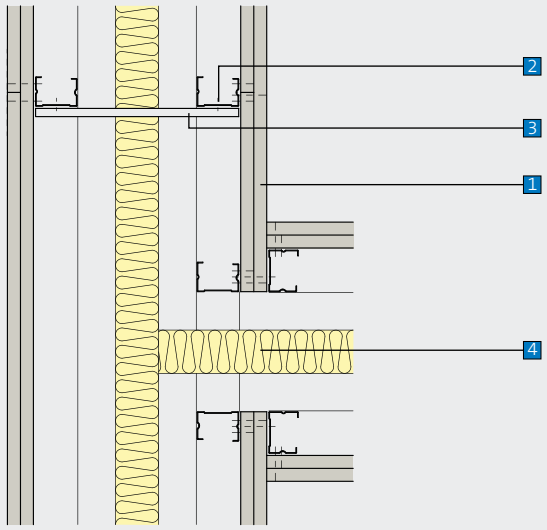
2 Deflection head for 15mm downward movement and 60 minutes fire resistance



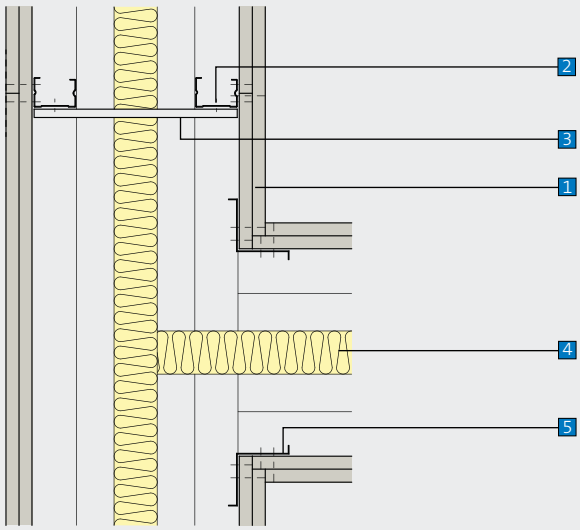
1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe 103 FC 50 Fixing Channel (at 1200mm vertical centres)
4 Gypframe Standard Floor & Ceiling Channel
5 Isover insulation
6 Sealant by others
7 Bulk fill with Gyproc jointing materials (where gap exceeds 5mm)
8 Skirting
9 Gypframe Deep Flange Floor & Ceiling Channel suitably fixed through fire-stop to structure
10 Firestrip by others
11 Gyproc CoreBoard
12 Gypframe GFS1 Fixing Strap
13 Gypframe Steel Angle where required

NB No fixings should be made through the boards into the flanges of the head channel. The arrow (⬅) denotes the position of the uppermost board fixing, which should be made into Gypframe GFS1 Fixing Strap. Continuous Firestrip must be installed as shown to maintain fire performance.

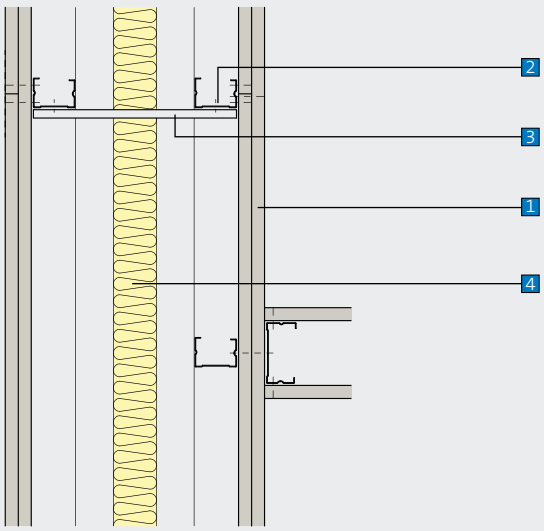
3 'T' junction



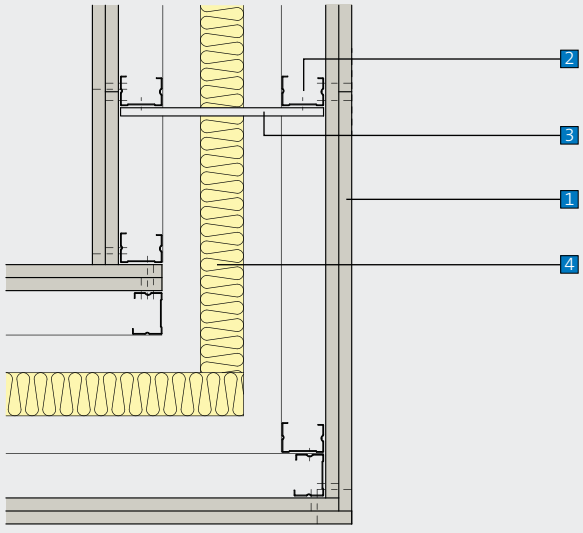
Alternative 'T' junction with Gypframe GA5 Internal Fixing Angle 4



5 'T' junction with GypWall CLASSIC partition



Internal / external corner 6



1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe 103 FC 50 Fixing Channel
4 Isover insulation

GypWall AUDIO

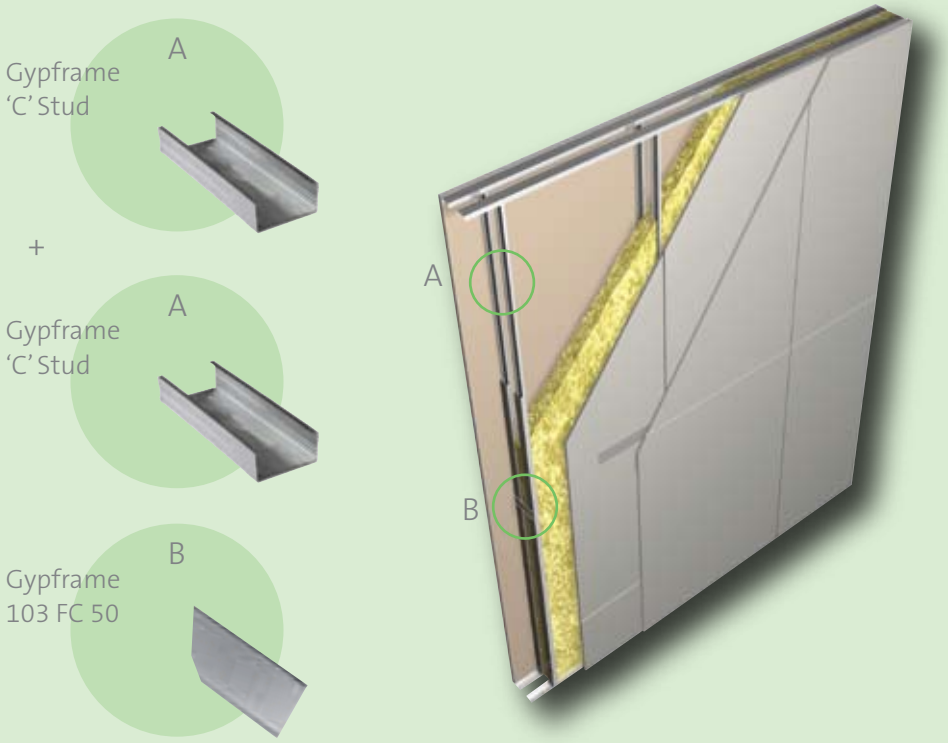
The ultimate sound insulating wall system

GypWall AUDIO

67 – 80 R_w dB

60 – 180 mins

GypWall AUDIO is a non-loadbearing, twin frame high performance wall system that provides exceptionally high levels of sound insulation. It is used to separate multiple use facilities, such as lecture theatres, music rooms, multi-screen cinemas, exhibition and conference centres.



Key facts

- Exceptionally high levels of sound insulation
- Designed to satisfy sound insulation requirements for cinemas equipped with high performance sound systems
- Lightweight, compared to masonry alternatives
- Up to 180 minutes fire resistance
- Can provide fire protection to structural steel within the wall cavity

Applications

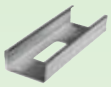
Applications requiring high performance acoustic partitioning, such as cinema walls.

Sector

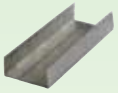
✓ Entertainment

System components

Gypframe metal products



100 S 90 'C' Stud — **Length** 3000mm



Standard Floor & Ceiling Channel
102 C 50
Deep Flange Floor & Ceiling Channel
102 DC 60
Extra Deep Flange Floor & Ceiling Channel
102 EDC 80
All channels are available in 3000mm

103 FC 50 Fixing Channel — **Length** 3000mm

Board products

Gyproc Regular
Thickness 12.5, 15mm
Width 1200mm

Gyproc FireStop
Thickness 12.5, 15mm
Width 1200mm

Gyproc DuraLine
Thickness 15mm
Width 1200mm

Fixing and finishing products

Gyproc Wafer Head Jack-Point Screws
For Gypframe metal-to-metal fixing 0.8mm thick or greater.

Gyproc Jack-Point Screws
For fixing boards to Gypframe metal framing 0.8mm thick or greater.

Gyproc Jointing Compound
For seamless jointing.

Gyproc Paper Tape
For joint reinforcement.

Gyproc Fibre Tape
For joint reinforcement.

Insulation products

Isover Acoustic Partition Roll
For improved acoustic performance.

Stone mineral wool (by others)
For fire-stopping and to achieve acoustic performance.

Eligible for the SpecSure warranty from Gyproc

Installation overview

Gypframe Floor & Ceiling Channels are fixed at the head and base to achieve the specified wall thickness. Gypframe 'C' Studs are fitted vertically to friction-fit within the channel sections and to abutments, to form the framework. This allows for adjustment during boarding. Studs should be fitted to face the same way and extended by splicing to the specified height. Additional framing is installed as required to support heavy fixtures. Insulation is installed into the cavity-formed frameworks. The frames are braced using Gypframe 103 FC 50 at specified centres. Sealant is applied to the frame perimeters to seal airpaths. Boards are screw-fixed to framing members to form the lining. Horizontal joints in face layer boards should be backed with Gypframe GFS1 Fixing Strap.

Services

Electrical and other services are normally installed after one side is boarded. Horizontal runs are routed through cut-outs in the studs. A high performance service box detail must be used.

Refer to Service penetrations and fixing into drywall systems.

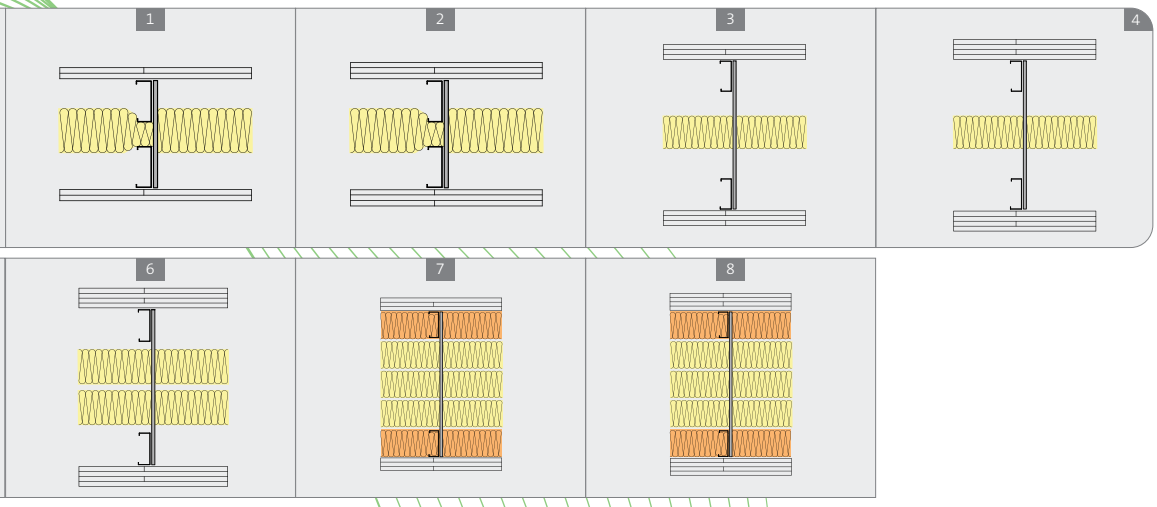
GypWall AUDIO incorporating alternative stud sizes

Whilst the system solutions shown in the following pages show Gypframe 100 S 90 'C' Studs, other Gypframe stud sizes can be used depending on the maximum height requirements. Contact the Gyproc Technical Team for further guidance.

GypWall AUDIO

Table 1 – GypWall AUDIO 100mm Gypframe 'C' Stud Solutions to satisfy the requirements of BS 476: Part 22: 1987

Two frames of Gypframe 100 S 90 'C' Studs spaced at 600mm centres with Gypframe 103 FC 50 at 3600mm centres. Linings and insulation as in table.



Detail	Partition thickness mm	Board type[1]	Lining thickness mm	Recommended maximum partition heights[2] Braces at 3600mm centres L/240 mm	L/125[3] mm	Acoustic Partition Roll mm	Sound insulation R_w (R_w + Ctr) dB	Duty rating	Approx. weight kg/m²	System reference
	90 minutes fire resistance BS									
1	300	Regular	2 x 15	8000	9500	100	67	Severe	46	A326011
2	300	Regular	3 x 12.5	8000	9500	100	69	Severe	53	A326002
	120 minutes fire resistance BS									
1	300	FireStop	2 x 12.5	8000	9500	100	65	Severe	42	BTC2917A
1	300	FireStop	2 x 15	8000	9500	100	66	Severe	51	BTC2918A
	180 minutes fire resistance BS									
3	550	FireStop	3 x 15	9000	11500	100	73 (67)	Severe	73	A326016
4	550	FireStop	4 x 12.5	9000	11500	100	75 (69)	Severe	74	A326016
5	550	FireStop	3 x 15	9000	11500	200	74 (66)	Severe	73	A326013
6	550	FireStop	4 x 12.5	9000	11500	200	76 (68)	Severe	74	A326013
7	600	FireStop	3 x 15	9000	11500	3 x 100 + 2 x 100 stone mineral wool	75 (67)	Severe	87	A326018
8	600	FireStop	4 x 12.5	9000	11500	3 x 100 + 2 x 100 stone mineral wool	77 (69)	Severe	96	A326018
7	700	FireStop	3 x 15	9000	11500	3 x 100 + 2 x 100 stone mineral wool	76 (69)	Severe	87	A326019
8	700	FireStop	4 x 12.5	9000	11500	3 x 100 + 2 x 100 stone mineral wool	78 (71)	Severe	96	A326019
7	800	FireStop	3 x 15	9500	11500	3 x 100 + 2 x 100 stone mineral wool	78 (69)	Severe	87	A326019
8	800	FireStop	4 x 12.5	9500	11500	3 x 100 + 2 x 100 stone mineral wool	80 (71)	Severe	96	A326019

1 For improved durability and impact resistance, the outer layer of Gyproc FireStop or Gyproc Regular can be replaced with a layer of 15mm Gyproc DuraLine.
2 For heights between 4200mm and 8000mm, Gypframe Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).
3 Refer to deflection criteria, in **Design** section.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

NB The stud frames must be braced at least once irrespective of the partition height or specified bracing centres.

Performance (►Refer to Basic principles of system design)

Table 2 - GypWall AUDIO fire protection to structural steel Solutions to satisfy the requirements of ENV 13381-4: 2002 and BS 476: Part 21: 1987

Board type[1]	Minimum Lining thickness mm	Fire resistance mins	Section factor[2] A/V (Hp/A) m^{-1}
Regular	2 x 12.5	30	Up to 300
Regular	2 x 15	60	Up to 300
FireStop	2 x 12.5	60	Up to 300
FireStop	2 x 12.5	90	Up to 200
FireStop	2 x 15	90	Up to 300
FireStop	2 x 15	120	Up to 110
FireStop	3 x 15	120	Up to 300

1 For improved durability and impact resistance, the outer layer of Gyproc FireStop or Gyproc Regular can be replaced with a layer of 15mm Gyproc DuraLine.
2 Based on four-sided exposure, with no vertical joints aligning with the column, and boards not fixed to the column to maintain air space.

Design

Planning - key factors
The position of services and heavy fixtures should be pre-determined and their installation planned into the frame erection stage.

Deflection criteria
Partitions built to a maximum height based on L/125 at 200 Pa will exibit greater deflection compared to partitions built to a maximum height based on L/240 at 200 Pa. Partitions with deflection characteristics outside the standard L/240 criteria will exhibit more flex during installation and in general use, and therefore we recommend you verify the acceptibility of the deflections with the relevant interested parties before specifying / installing partitions based on L/125 criteria.

Cross bracing
Laboratory tests were carried out on walls without bracing. The results, however, are a realistic representation of site conditions in which Gypframe 103 FC 50 cross-braces are fitted at the recommended 3600mm maximum centres, provided that appropriate measures are taken on site to eliminate flanking sound transmission. Test evidence is provided by Gyproc Report ATR 1299, where a site test on a large multi-screen cinema wall achieved comparable performance to the equivalent specification tested in the laboratory without bracing.

Cavity fire barriers
Stone mineral wool cut neatly to fit across the cavity forms a suitable closure.

Refer to Cavity fire barriers.

Services
Penetrations
Penetrations of fire-resistant or sound-insulating constructions for services need careful consideration to ensure that the performance of the element is not downgraded and also that the services themselves do not act as the mechanism of fire spread or sound transmission.

Refer to Service installations.

Independent support
When designing for the installation of services, such as fire dampers and associated ductwork, through a **GypWall** partition, consideration should be given to the size and weight of the damper. This will determine whether it can be supported directly from the partition or needs to be independently supported from the structure.

Refer to Service installations.

Electrical
The installation of electrical services should be carried out in accordance with BS 7671. The cut-outs in the studs can be used for routing electrical and other small services (see **GypWall CLASSIC Construction details – 1**). Switch boxes and socket outlets can be supported from Gypframe 103 FC 50 Fixing Channels fixed horizontally between studs or a high performance socket box detail where higher acoustic performance is required.

Fixing floor and ceiling channels
Gypframe Floor & Ceiling Channels must be securely fixed with a row of fixings at 600mm maximum centres. For 102mm channels and above, two rows of staggered fixings are required, each row at 600mm centres and each fixing 25mm in from the flange. If the floor is uneven, a 38mm thick timber sole plate equal to the width of the channel should be used.

If the concrete or screeded floor is new, consideration should be given to the installation of a damp-proof membrane between the floor surface and the channel or sole plate.

Door openings
Any openings will require careful detailing if the acoustic performance is to be maintained. Specialist heavy acoustic doorsets may require additional support.

Framing surround for openings
Where services such as horizontal ducts, fire dampers and access panels are required to penetrate the wall, their position should be pre-determined in order that a framed opening can be provided.

Refer to Service installations.

Deflection heads
Partition head deflection designs may be necessary to accommodate deflections in the supporting floor. Deflection heads may also be required to the underside of roof structures subjected to positive and negative pressures.

Refer to section Principles of building acoustics.

Fixtures
Lightweight fixtures can be made directly to the partitions. Medium weight fixtures can be made to Gypframe 103 FC 50 Fixing Channel. Heavyweight fixtures (to BS 5234), such as wash basins and wall cupboards, can be fixed using Gypframe 103 FC 90 Gypframe Fixing Channel.

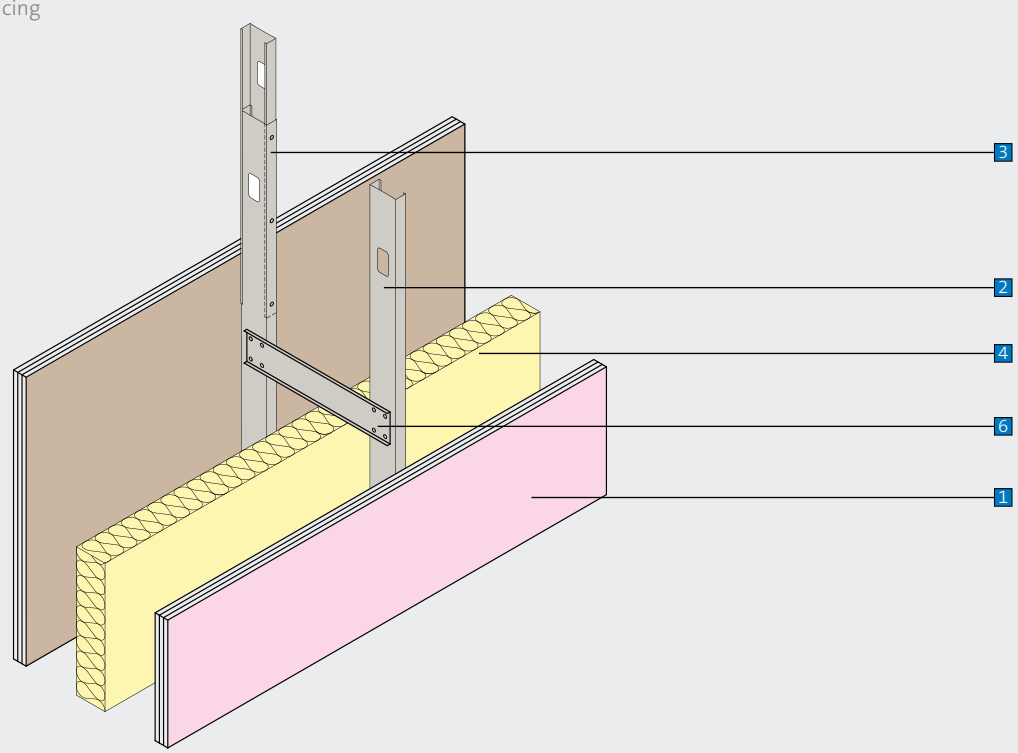
Refer to section Service penetrations and fixing into drywall systems.

Board finishing

Refer to Finishing systems.

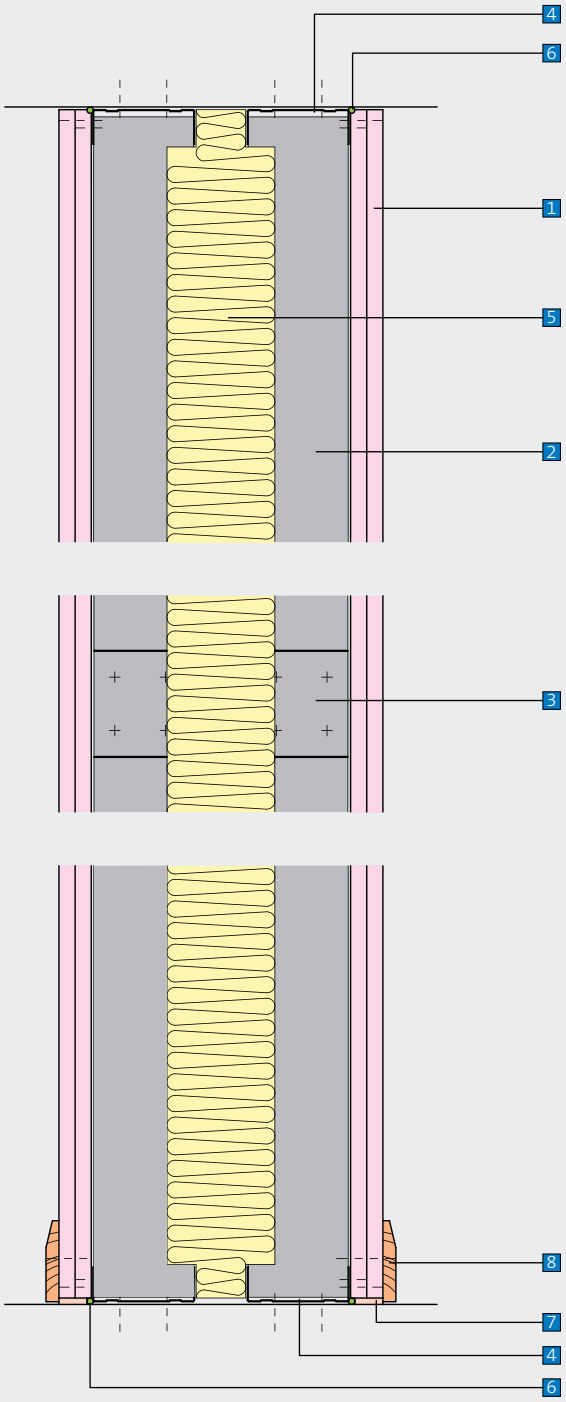
Construction details

1 Splicing and solid bracing

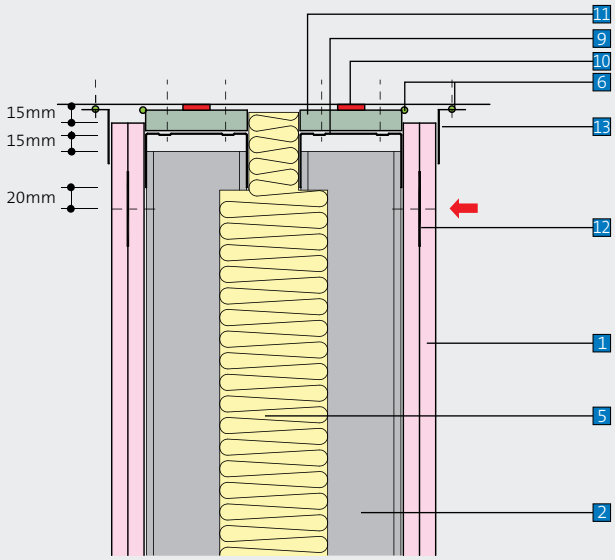


1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Splice - 600mm overlap with three Gyproc Wafer Head Jack-Point Screws into each flange
4 Isover insulation
6 Brace formed from Gypframe 103 FC 50

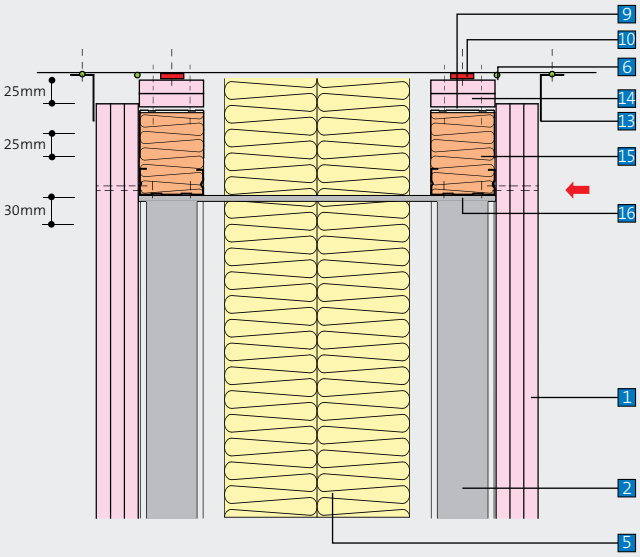
2 Head and base



3 Deflection head for 15mm downward movement and 90 minutes fire resistance



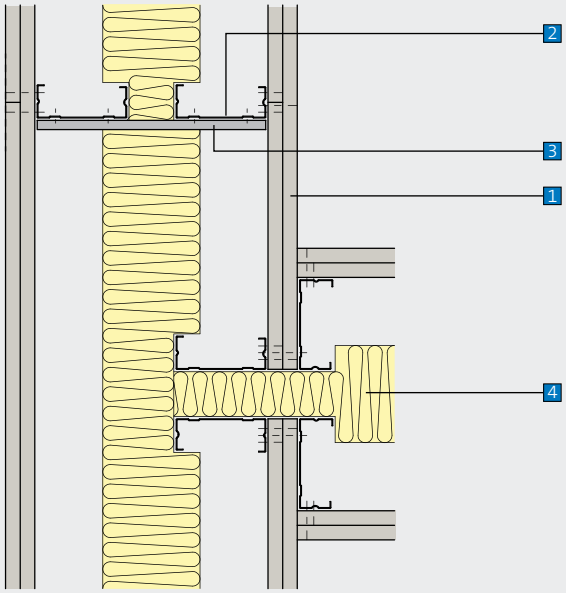
4 Deflection head for 25mm downward movement and 120 minutes fire resistance



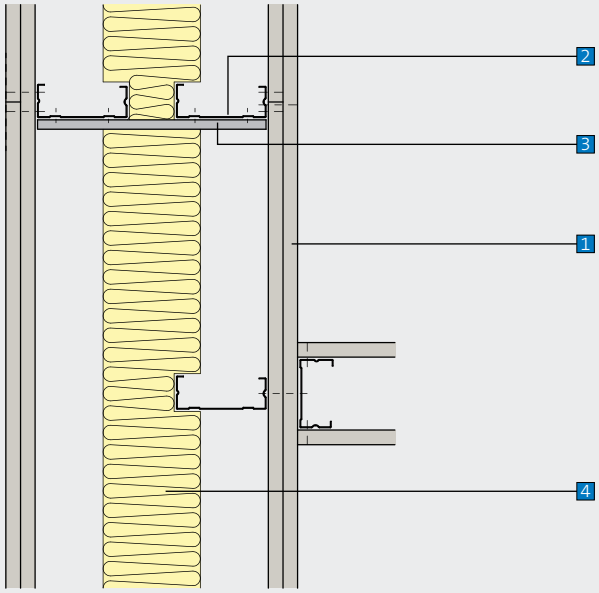
1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe 103 FC 50 Fixing Channel
4 Gypframe Standard Floor & Ceiling Channel
5 Isover insulation from KIMMCO
6 Sealant by others
7 Bulk fill with Gyproc jointing materials (where gap exceeds 5mm)
8 Skirting
9 Gypframe Deep Flange Floor & Ceiling Channel suitably fixed through fire-stop to structure
10 FireStrip by others
11 Gyproc CoreBoard
12 Gypframe GFS1 Fixing Strap
13 Steel Angle
14 2 layers of 15mm Gyproc FireStop Board
15 Stone mineral wool - 33kg/m³ minimum density
16 Stud noggings tied together with short lengths of Gypframe 103 FC 50 Fixing Channel

NB No fixings should be made through the boards into the flanges of the head channel. The arrow (←) denotes the position of the uppermost board fixing, which should be made into Gypframe GFS1 Fixing Strap. Continuous FireStrip must be installed as shown to maintain fire performance.

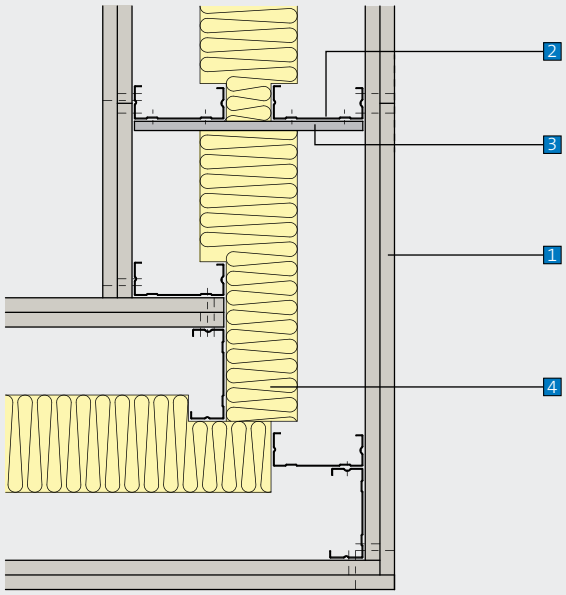
5 'T' junction



6 'T' junction with **GypWall** CLASSIC partition



7 Internal / external corner



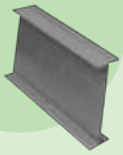
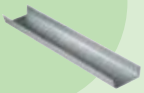
1 Gyproc plasterboard
2 Gypframe 'C' Stud
3 Gypframe 103 FC 50 Fixing Channel
4 Isover insulation

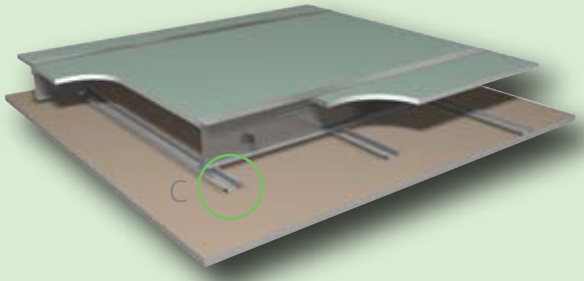

Theatres & Renal Research Labs
Elective Treatment Centre
Link to MRI, Purple Zone
The Manchester Heart Centre
Renal Dialysis Unit
Renal Administration
Respiratory Medicine
Rheumatology
Rheumatology

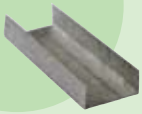
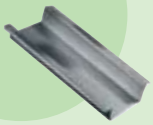
ShaftWall

39 – 52 R_w dB 60 – 120 mins

ShaftWall provides a lightweight, fire-resistant structure to protect elements in confined spaces wherever access is limited to one side only. The system provides a protective structure which can be incorporated at an early stage of the construction without the need for scaffolding. The system can also be built horizontally to provide a fire-rated membrane. StairWall is a derivative of the ShaftWall system, which is used to protect stairwells.

A
Gypframe 'I' Stud

+
Gypframe Retaining Channel




B
Gypframe Floor & Ceiling Channel

+
C
Gypframe MF5 Ceiling Section


Key facts

- Lightweight, fast-track construction
- Provides fire protective shaft enclosures, stairwells and horizontal membranes
- A solution for all enclosures and risers where access is limited to one side only
- Horizontal membranes built entirely from below
- Installation can commence earlier in construction
- Minimal wall thickness of 87mm
- Satisfies deflection and air pressure requirements

Applications

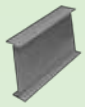
Service risers, lift shafts, service ducts and stairwells.

Sector

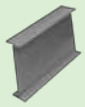
- ✓ Office / commercial
- ✓ Retail
- ✓ Healthcare
- ✓ Apartment buildings
- ✓ High-rise multi-occupancy

System components

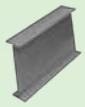
Gypframe metal products



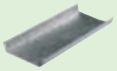
70 I 70 'I' Stud — **Length** 3000mm



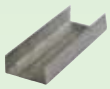
100 I 80 'I' Stud — **Length** 3000mm



150 I 90 'I' Stud — **Length** 3000mm



Starter Channels — **Length**
70 SC 70 3000mm
100 SC 80 3000mm
150 SC 90 3000mm

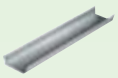


Standard Floor & Ceiling Channels
72 C 50
102 C 50
152 C 50

Deep Flange Floor & Ceiling Channels
72 DC 60
102 DC 60
152 DC 60

Extra Deep Flange Floor & Ceiling Channels
72 EDC 80
102 EDC 80
152 EDC 80

All channels are available in 3000mm.

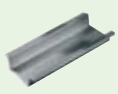


Retaining Channels Fixing
RC 70
RC 100
RC 150
All channels are available in 3000mm.

CoreBoard Joint Angle — **Length** 3000mm

103 FC 50 Fixing Channel — **Length** 3000mm

GFS1 Fixing Strap — **Length** 3000mm



MF5 Ceiling Section — **Length** 3000mm

GA1 Perimeter Angle
Perimeter support for MF5s — **Length** 3000mm

Board products

Gyproc FireStop[1]
Thickness 12.5, 15mm
Width 1200mm

Gyproc CoreBoard
Thickness 19mm
Width 598mm

Gyproc DuraLine[1]
Thickness 15mm
Width 1200mm

1 Moisture resistant (MR) versions of the above boards are specified in intermittent wet use areas, e.g. shower cubicles.

Fixing and finishing products

Gyproc Wafer Head Jack-Point Screws
For Gypframe metal-to-metal fixing 0.8mm thick or greater

Gyproc Drywall Screws
For fixing boards to Gypframe metal framing less than 0.8mm thick
or

Gyproc Jack-Point Screws
For fixing boards to Gypframe metal framing 0.8mm thick or greater

Gyproc Jointing Compound
For seamless jointing.

Gyproc Paper Tape
For joint reinforcement.

Gyproc Fibre Tape
For joint reinforcement.

Insulation products

Isover Acoustic Partition Roll
25mm for improved acoustic performance.

Eligible for the SpecSure warranty from Gyproc

Installation overview

Gypframe Floor & Ceiling Channel is fixed to the structure and Gypframe Starter Channel to vertical abutments. (Please reference to the relevant performance tables for head channels) where required Firestrip is used in a continuous line to seal at the head.

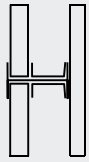
ShaftWall is assembled from the non-shaft side using Gypframe 'I' Stud framing. Gyproc CoreBoard is located between studs and secured using Gypframe Retaining Channel. All horizontal joints in the Gyproc CoreBoard layer are fire-stopped. Gyproc FireStop board linings are fixed to the non-shaft side of the frame. Deflection is accommodated at the head by incorporating plasterboard fire-stops cut on site. If specified, 25mm Isover APR is included in the cavity to enhance the acoustic performance.

Pressurised shafts and service ducts are sealed using sealant. This is applied to all board-to-metal junctions.

Services
Penetrations for services, ducting and access panels require the construction of a framed opening. Fire-stopping is installed by specialist contractors.

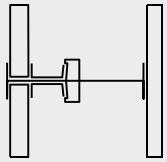
Table 1 – ShaftWall (vertical elements) - Solutions to satisfy the requirements of BS 476: Part 22: 1987

1



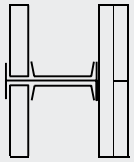
Gypframe 70 or 100mm 'I' Stud framework with Gyproc CoreBoard between studs, secured by Gypframe Retaining Channel.
25mm Isover APR 1200 in cavity (optional).
Lining boards to non-shaft side, see table.

2



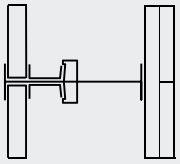
Gypframe 150 I 90 tabbed 'I' Stud framework with Gyproc CoreBoard between studs, secured by Gypframe Retaining Channel.
25mm Isover APR 1200 in cavity (optional).
Lining boards to non-shaft side, see table.

3



Gypframe 70 or 100mm 'I' Stud framework with Gyproc CoreBoard between studs, secured by Gypframe Retaining Channel.
25mm Isover APR 1200 in cavity (optional).
Lining boards to non-shaft side, see table.

4



Gypframe 150 I 90 tabbed 'I' Stud framework with Gyproc CoreBoard between studs, secured by Gypframe Retaining Channel.
25mm Isover APR 1200 in cavity (optional).
Lining boards to non-shaft side, see table.

Detail	Partition thickness mm	Lining boards to non-shaft side[1] Board type	Lining thickness mm	Maximum partition heights[2] mm	Stud size mm	Sound insulation R_w[3] No Insulation dB	Sealed structure[4] plus 25mm Isover APR 1200 dB	Duty rating[5]	Approx. weight kg/m²	System reference
	60 minutes fire resistance BS									
1	87	FireStop	1 x 15	4200	70	39	42	Heavy	30	A306001/010
1	117	FireStop	1 x 15	6000	100	40	43	Heavy	31	A306004/011
2	167	FireStop	1 x 15	7700	150	43	46	Heavy	33	A306007
	90 minutes fire resistance BS									
3	97	FireStop	2 x 12.5	4400	70	40	44	Severe	39	A306002/012
3	127	FireStop	2 x 12.5	6400	100	45	47	Severe	40	A306005/014
4	177	FireStop	2 x 12.5	7900	150	48	52	Severe	42	A306008/020
	120 minutes fire resistance BS									
3	102	FireStop	2 x 15	4500	70	42	45	Severe	43	A306003/023
3	132	FireStop	2 x 15	6700	100	44	46	Severe	44	A306006/025
4	182	FireStop	2 x 15	7900	150	48	50	Severe	46	A306009/028

1 For improved durability and impact resistance, the outer layer of Gyproc FireStop can be replaced with a layer of 15mm Gyproc DuraLine. On single layer linings this will improve duty rating to Severe Duty.

2 Based on a limiting deflection of L/240 at 200 Pa.

3 The acoustic performance figures quoted include **ShaftWall** partitions with deflection heads.

4 Gyproc CoreBoard and first layer of lining board are bedded onto sealant, as required for pressurised air shafts, in addition to normal sealing.

5 Estimated rating from non-shaft side only.

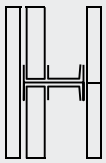
6 The temperature of exposed metal may exceed the requirements of BS 476: Part 22: 1987 within the fire test period, and therefore relaxation should be sought from the approving Authority on the basis that no combustible materials are likely to be stored adjacent to the structure. In situations where the full period of insulation is required, contact the Gyproc Technical Team for further guidance.

NB The fire resistance and sound insulation performances are for imperforate partitions, but incorporating deflection heads, with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

NB For heights up to 4200mm Gypframe Floor & Ceiling Channel should be used at the base and Gypframe Deep Flange Floor & Ceiling Channel at the head. For heights between 4200mm and 8000mm Gypframe Deep Flange Floor & Ceiling Channel should be used at the head and base. For heights in excess of 8000mm Gypframe Extra Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

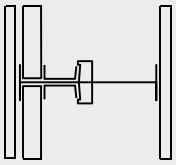
Table 2 – StairWall (vertical elements) - Solutions to satisfy the requirements of BS 476: Part 22: 1987

1



Gypframe 70 or 100mm 'I' Stud framework with Gyproc CoreBoard between studs, secured by Gypframe Retaining Channel. 25mm Isover APR 1200 in cavity (optional). Lining boards to both sides, see table.

2



Gypframe 150 I 90mm sabbed 'I' Stud framework with Gyproc CoreBoard between studs, secured by Gypframe Retaining Channel. 25mm Isover APR 1200 in cavity (optional). Lining boards to both sides, see table.

Detail	Partition thickness	Lining boards to non-shaft side[1]		Maximum partition heights[2]	Stud size	Sound insulation R_w[3]		Duty rating[5]	Approx. weight	System reference
		Board type	Lining thickness			No Insulation	Sealed structure[4] plus 25mm Isover APR 1200			
	mm		mm	mm	mm	dB	dB		kg/m²	
	90 minutes fire resistance BS									
1	97	FireStop	1 x 12.5	4400	70	42	45	Medium	39	A306046/048
1	127	FireStop	1 x 12.5	6100	100	44	48	Medium	40	A306046/048
2	177	FireStop	1 x 12.5	7900	150	48	50	Medium	42	A306046/048
	120 minutes fire resistance BS									
1	102	FireStop	1 x 15	4400	70	42	47	Heavy	43	A306047/049
1	132	FireStop	1 x 15	6500	100	45	49	Heavy	44	A306047/049
2	182	FireStop	1 x 15	7900	150	48	50	Heavy	46	A306047/049

1 For improved durability and impact resistance, Gyproc FireStop can be replaced with a layer of 15mm Gyproc DuraLine. On single layer linings this will improve duty rating to Severe Duty.

2 Based on a limiting deflection of L/240 at 200 Pa.

3 The acoustic performance figures quoted include StairWall partitions with deflection heads.

4 Gyproc CoreBoard and first layer of lining board are bedded onto sealant, as required for pressurised air shafts, in addition to normal sealing.

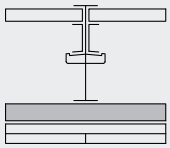
5 Estimated rating.

NB The fire resistance and sound insulation performances are for imperforate partitions, but incorporating deflection heads, with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

NB For heights up to 4200mm Gypframe Floor & Ceiling Channel should be used at the base and Gypframe Deep Flange Floor & Ceiling Channel at the head. For heights between 4200mm and 8000mm Gypframe Deep Flange Floor & Ceiling Channel should be used at the head and base. For heights in excess of 8000mm Gypframe Extra Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

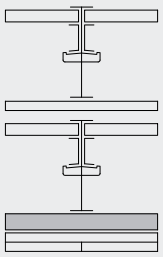
Table 3 – ShaftWall (horizantal elements) - Solutions to satisfy the requirements of BS 476: Part 22: 1987

1



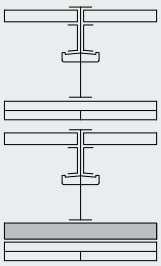
Gypframe 70 or 100mm 'I' Stud or Gypframe 150 I 90 tabbed 'I' Stud frames with Gyproc CoreBoard between studs, secured by Gypframe Retaining Channel. 25mm Isover APR 1200 in cavity (optional).
Gypframe MF5 Ceiling Sections fixed to ceiling side at 450mm centres.
Lining boards to ceiling side, see table.

2



Two Gypframe 150 I 90 tabbed 'I' Stud frames with Gyproc CoreBoard between studs, secured by Gypframe Retaining Channel. 25mm Isover APR 1200 in cavity (optional). On the lower framework only, Gypframe MF5 Ceiling Sections fixed to ceiling side at 450mm centres.
Lining boards to ceiling side, see table.

3



Two Gypframe 150 I 90 tabbed 'I' Stud frames with Gyproc CoreBoard between studs, secured by Gypframe Retaining Channel. 25mm Isover APR 1200 in cavity (optional). On the lower framework only, Gypframe MF5 Ceiling Sections fixed to ceiling side at 450mm centres.
Lining boards to ceiling side, see table.

Detail	Membrane thickness	Lining boards to ceiling side: Board type	Lining boards to ceiling side: Lining thickness	Maximum span[1]	Stud size	Sound insulation R_w: No Insulation	Sound insulation R_w: Sealed structure[2] plus 25mm Isover APR 1200	Approx. weight	System reference
	mm		mm	mm	mm	dB	dB	kg/m²	
	60 minutes fire resistance BS								
1	124	FireStop	2 x 15	2800	70	42	45	39	C106053
1	154	FireStop	2 x 15	3700	100	44	46	39	C106054
1	204	FireStop	2 x 15	5100	150	48	50	39	C106055
	90 minutes fire resistance BS								
2	391	FireStop upper frame / FireStop lower frame	1 x 15 / 2 x 15	5100	150	48	50	77	C106057
	120 minutes fire resistance BS								
3	406	FireStop upper frame / FireStop lower frame	2 x 15 / 2 x 15	5100	150	48	50	88	C106056

1 Based on a limiting deflection of L/400.

2 Gyproc CoreBoard and first layer of lining board are bedded onto sealant, as required for pressurised air shafts, in addition to normal sealing.

NB The fire resistance and sound insulation performances are for imperforate ceilings incorporating boards with all joints taped and filled according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

NB The fire resistances quoted are for imperforate constructions.

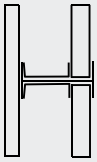
NB **ShaftWall** used horizontally should not be used for materials storage or for access for personnel.

NB Gypframe Extra Deep Flange Floor & Ceiling Channel should be used at perimeter.

Performance (▶Refer to Basic principles of system design)

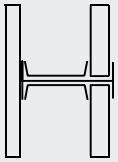
Table 4a - ShaftWall (vertical elements) - limiting heights at various air pressures and allowable deflections

1



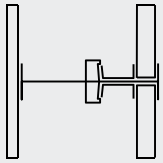
Gypframe 70 I 70 'I' Stud framework with one layer of 15mm Gyproc FireStop[1].

2



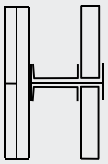
Gypframe 100 I 80 'I' Stud framework with one layer of 15mm Gyproc FireStop[1].

3



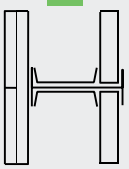
Gypframe 150 I 90 tabbed 'I' Stud framework with one layer of 15mm Gyproc FireStop[1].

4



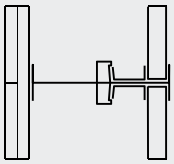
Gypframe 70 I 70 'I' Stud framework with two layers of 12.5mm Gyproc FireStop[1].

5



Gypframe 100 I 80 'I' Stud framework with two layers of 12.5mm Gyproc FireStop[1].

6



Gypframe 150 I 90 tabbed 'I' Stud framework with two layers of 12.5mm Gyproc FireStop[1].

Detail	System	Allowable deflection	Limiting height (mm) at stated air pressure (Pa) 200	240	300	360	400	480	500	600	650	System reference
		L/125	5000	4700	4400	4100	4000	3800	3700	3500	3400	
1	ShaftWall	L/240	4200	4000	3700	3500	3300	3200	3100	2900	2800	A306001/010
		L/360	3700	3500	3300	3100	2900	2800	2700	2600	2500	
		L/125	7500	7100	6600	6200	6000	5700	5500	5200	5100	
2	ShaftWall	L/240	6000	5700	5300	5000	4800	4600	4400	4200	4100	A306004/011
		L/360	5200	4900	4600	4300	4200	4000	3900	3600	3500	
		L/125	9600	9000	8400	7900	7600	7200	7100	6700	6500	
3	ShaftWall	L/240	7700	7300	6700	6400	6100	5800	5700	5400	5200	A306008/020
		L/360	6700	6400	5900	5500	5400	5000	5000	4700	4600	
		L/125	5200	4900	4600	4300	4200	4000	3800	3600	3500	
4	ShaftWall	L/240	4400	4100	3800	3600	3500	3300	3200	3000	2900	A306002/012
		L/360	3800	3600	3300	3100	3000	2900	2800	2600	2500	
		L/125	7900	7400	6900	6500	6300	5900	5800	5500	5300	
5	ShaftWall	L/240	6400	6000	5600	5200	5000	4800	4700	4400	4300	A306005/014
		L/360	5600	5200	4900	4600	4400	4200	4100	3900	3800	
		L/125	9800	9200	8600	8100	7800	7500	7200	6800	6600	
6	ShaftWall	L/240	7900	7400	6900	6500	6200	6000	5800	5500	5300	A306008/020
		L/360	6900	6500	6000	5600	5500	5200	5100	4800	4600	

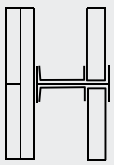
Table 4a gives the limiting heights for **ShaftWall** systems when subjected to air pressures ranging from 200 Pa through to 650 Pa and at three allowable deflection levels - L/125, L/240, L/360. Partition heights are normally quoted for air pressures of 200 Pa at an allowable deflection of L/240. Refer to **Limiting heights at different air pressures,** in **Design** section.

1 Gyproc FireStop can be replaced with Gyproc DuraLine.

NB For heights up to 4200mm Gypframe Floor & Ceiling Channel should be used at the base and Gypframe Deep Flange Floor & Ceiling Channel at the head. For heights between 4200mm and 8000mm Gypframe Deep Flange Floor & Ceiling Channel should be used at the head and base. For heights in excess of 8000mm Gypframe Extra Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

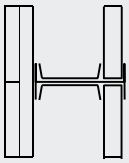
Table 4b - ShaftWall (vertical elements) - limiting heights at various air pressures and allowable deflections

1



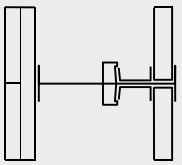
Gypframe 70 I 70 'I' Stud framework with two layers of 15mm Gyproc FireStop[1].

2



Gypframe 100 I 80 'I' Stud framework with two layers of 15mm Gyproc FireStop[1].

3



Gypframe 150 I 90 tabbed 'I' Stud framework with two layers of 15mm Gyproc FireStop[1].

Detail	System	Allowable deflection	Limiting height (mm) at stated air pressure (Pa)									System reference
			200	240	300	360	400	480	500	600	650	
		L/125	5200	4900	4600	4300	4100	4000	3800	3600	3500	
1	ShaftWall	L/240	4500	4200	3900	3700	3500	3400	3300	3100	3000	A306003/023
		L/360	3900	3700	3400	3200	3100	3000	2900	2700	2600	
		L/125	8400	7900	7300	6900	6600	6400	6200	5800	5600	
2	ShaftWall	L/240	6700	6300	5900	5500	5300	5100	5000	4700	4500	A306006/025
		L/360	5600	5300	4900	4600	4500	4300	4100	3900	3800	
		L/125	9900	9300	8600	8100	7800	7500	7200	6800	6600	
3	ShaftWall	L/240	7900	7400	6900	6500	6300	6000	5800	5500	5300	A306009/028
		L/360	6900	6500	6000	5700	5500	5300	5100	4800	4700	

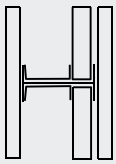
Table 4b gives the limiting heights for **ShaftWall** systems when subjected to air pressures ranging from 200 Pa through to 650 Pa and at three allowable deflection levels - L/125, L/240, L/360. Partition heights are normally quoted for air pressures of 200 Pa at an allowable deflection of L/240. Refer to **Limiting heights at different air pressures,** in **Design** section.

1 Gyproc FireStop can be replaced with Gyproc DuraLine.

NB For heights up to 4200mm Gypframe Floor & Ceiling Channel should be used at the base and Gypframe Deep Flange Floor & Ceiling Channel at the head. For heights between 4200mm and 8000mm Gypframe Deep Flange Floor & Ceiling Channel should be used at the head and base. For heights in excess of 8000mm Gypframe Extra Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

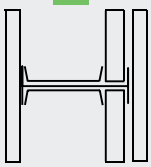
Table 4c - StairWall (vertical elements) - limiting heights at various air pressures and allowable deflections

1



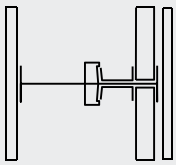
Gypframe 70 I 70 'I' Stud framework
with one layer of 12.5mm Gyproc FireStop on each side.

2



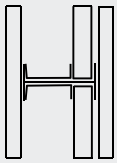
Gypframe 100 I 80 'I' Stud framework
with one layer of 12.5mm Gyproc FireStop on each side.

3



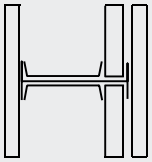
Gypframe 150 I 90 tabbed 'I' Stud framework
with one layer of 12.5mm Gyproc FireStop on each side.

4



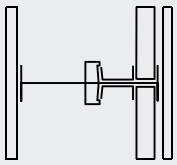
Gypframe 70 I 70 'I' Stud framework
with one layer of 15mm Gyproc FireStop on each side.

5



Gypframe 100 I 80 'I' Stud framework
with one layer of 15mm Gyproc FireStop on each side.

6



Gypframe 150 I 90 tabbed 'I' Stud framework
with one layer of 15mm Gyproc FireStop on each side.

Detail	System	Allowable deflection	Limiting height (mm) at stated air pressure (Pa) 200	240	300	360	400	480	500	600	650	System reference
		L/125	5300	5000	4700	4400	4200	4100	3900	3700	3600	
1	StairWall	L/240	4400	4100	3800	3600	3500	3300	3200	3000	2900	A306046/048
		L/360	3900	3600	3400	3200	3100	2900	2800	2700	2600	
		L/125	7600	7100	6600	6200	6000	5700	5600	5200	5100	
2	StairWall	L/240	6100	5700	5300	5000	4800	4500	4500	4200	4100	A306046/048
		L/360	5300	5000	4600	4300	4200	3900	3900	3700	3600	
		L/125	8100	7600	7000	6600	6400	6000	5900	5600	5400	
3	StairWall	L/240	6500	6100	5700	5300	5100	4800	4800	4500	4400	A306046/048
		L/360	5600	5300	4900	4600	4400	4200	4100	3900	3800	
		L/125	5400	5000	4700	4400	4200	4100	3900	3700	3600	
4	StairWall	L/240	4400	4100	3800	3600	3500	3300	3200	3000	2900	A306047/049
		L/360	3900	3600	3400	3200	3100	2900	2800	2700	2600	
		L/125	9800	9200	8600	8100	7800	7300	7200	6800	6600	
5	StairWall	L/240	7900	7400	6900	6500	6300	5900	5800	5500	5300	A306047/049
		L/360	6900	6500	6000	5700	5500	5200	5100	4800	4700	
		L/125	9800	9200	8600	8100	7800	7300	7200	6800	6600	
6	StairWall	L/240	7900	7400	6900	6500	6300	5900	5800	5500	5300	A306047/049
		L/360	6900	6500	6000	5700	5500	5200	5100	4800	4700	

Table 4c gives the limiting heights for **ShaftWall** systems when subjected to air pressures ranging from 200 Pa through to 650 Pa and at three allowable deflection levels - L/125, L/240, L/360. Partition heights are normally quoted for air pressures of 200 Pa at an allowable deflection of L/240. Refer to **Limiting heights at different air pressures,** in **Design** section.

1 Gyproc FireStop can be replaced with Gyproc DuraLine.

NB For heights up to 4200mm Gypframe Floor & Ceiling Channel should be used at the base and Gypframe Deep Flange Floor & Ceiling Channel at the head. For heights between 4200mm and 8000mm Gypframe Deep Flange Floor & Ceiling Channel should be used at the head and base. For heights in excess of 8000mm Gypframe Extra Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

Design

Planning - key factors
The position of services should be pre-determined and their installation planned into the frame erection stage. Timber sole plates should be considered, where allowed, where the floor is uneven.

Refer to Service installations.

It is important that a good standard of control is exercised on site to ensure that the adoption of drylining techniques at such an early stage of construction is fully integrated into the planning and site progress. If the building envelope is left unsealed while **ShaftWall** or **StairWall** is under construction, Gyproc FireStop MR or Gyproc DuraLine MR should be used for the lining. All penetrations will need to be adequately fire-stopped.

Limiting heights at different air pressures
The maximum heights quoted in the performance tables are based on a limiting deflection of L/240 at 200 Pa. In practice, deflection from L/125 to L/360 may be allowed and pressure conditions between 200 Pa and 650 Pa may be encountered. These variations will affect the maximum wall height. Refer to Tables 4a,4b and 4c.

Deflection criteria
Partitions built to a maximum height based on L/125 at 200 Pa will exibit greater deflection compared to partitions built to a maximum height based on L/240 at 200 Pa. Partitions with deflection characteristics outside the standard L/240 criteria will exhibit more flex during installation and in general use, and therefore we recommend you verify the acceptibility of the deflections with the relevant interested parties before specifying / installing partitions based on L/125 criteria.

Connection to the structure
Structural steelwork and its associated connections often result in complex junctions around shafts. If **ShaftWall** or **StairWall** is built on the same line as the beamwork framing the shaft, problems may arise in trying to seal the wall up to the steelwork. It is recommended that, wherever possible, the wall should be located to one side of the beams, and fixed from structural floor to structural soffit.

Fixing the floor channel
The floor channel must have continuous support along its length to maintain specified performance levels. If continuous support is not provided by the structure, e.g. Z-sections running transverse to a steel beam, the designer should detail the installation of a rigid non-combustible material between the Z-sections. In situations where the floor channel is fixed to diagonal structural steel, the studs should be accurately scribed to the rake of the channel to maintain the full bearing surface.

Fixing to metal decking
Where **ShaftWall** or **StairWall** is to be located transverse to the profiles of the decking, all slots or perforations above the head channel should be sealed using a proprietary fire barrier or fire spray. Fire-stopping material can be applied prior to the head channel being positioned, providing that any surplus is removed flush with the steel decking.

Fixing to fire-sprayed and stone mineral wool protected structural steel
If it should be necessary to build the wall on the line of steel beams, then a method must be used to minimise the disruption of the fire protection.

Z-section, with a depth equal to the thickness of the fire protection being applied, should be fixed to the beam at maximum 600mm centres prior to application of the fire protection.

The dimensions of the Z-section should be determined by the designer, but as a guide should not be less than 2mm gauge steel. The applied fire protection incorporating the Z-section should then provide a continuous fire-stopped support above the head channel of the **ShaftWall** or **StairWall** when this is secured into position (see **Construction details – 24**). The head channel should be securely fixed to each Z-section using two Gyproc Wafer Head Jack-Point Screws. Where it is necessary to fix Z-sections to previously fire protected beams, making good above the head channel and around the Z-sections is essential.

Fixing to structural steel encasements
Where **ShaftWall** abuts a column or beam encasement, the framing will generally require fixing to the structural steelwork.

Where ShaftWall abuts the web of the steelwork a Z-section can be located to provide a fixing point level with the flanges of the steelwork.

Off-set fixing
Where **ShaftWall** is off the line of the steelwork or supporting structure, it can be cantilevered back using Z-section or flat steel plate as determined by the designer. These will require separate fire protection to maintain the fire performance of the system.

Wall positioned adjacent to steel beams
Where **ShaftWall** abuts the floor decking adjacent to a steel beam, provision will be required to maintain fire protection of the composite structure, e.g. filling voids at head of partition with suitable fire-stopping materials.

Pressurised airshafts and service ducts
The use of pressure conditions in various types of shaft / duct requires that the boards should be sealed into the framing members using sealant in addition to the normal sealing of the framing to adjoining structures. It is essential that these areas are identified at a very early stage of the contract, and that other trades are instructed to recognise the need for the application of sealant and its replacement if subsequently damaged or removed.

In order that the integrity of the pressurised system can be maintained, sealant should be specified for all board-to-metal applications, and the sealing of Gyproc CoreBoard to the framing (see **Construction details – 19 - 22**).

Design

Deflection heads
Deflection heads, by definition, must be able to move and, therefore, achieving an airtight seal is difficult. Inevitably, this will have a detrimental effect on the acoustic performance of any wall that incorporates deflection at the head. In most cases, a suspended ceiling will assist in minimising loss of performance. Standard head details are shown in **Construction details – 11-14**. Firestrip must be applied as a continuous seal where indicated to maintain fire performance. Also, board fixings must not be inserted above the uppermost line depicted by the red arrow in each drawing. Where greater deflection needs to be accommodated, contact the Gyproc Technical Team for further guidance.

Control joints
Control joints may need to be considered in conditions where excessive movement is likely to occur, or to coincide with constructional expansion joints. In order that the deflection criteria can be maintained throughout the building, it is necessary to introduce horizontal movement joints in the lining where this would normally be required to extend through the height of the building, e.g. stairwells.

The horizontal movement joint can be accommodated adjacent to the floor slab (see **Construction details – 30**).

Doors
In the case of both normal access doors and lift doors, the door and frame assembly must have been shown by a fire resistance test to achieve the required standard of performance in this form of construction.

Lift doors must be substantiated in conjunction with ShaftWall complete with their framing members and transom panels. To achieve a satisfactory level of compatibility, a suitable starter channel should be mechanically fixed to the door frame at 300mm centres (see **Construction details – 21**).

Access for maintenance
For access doors, openings should be framed to avoid impairing the structural or fire-resistant properties of **ShaftWall**. To provide an opening ready to receive a door set, the jambs to storey height should be capped with Gypframe Channel incorporating a plasterboard packer. A pre-formed spandrel panel assembled between starter channels (see **Construction details – 20**) should be inserted between jambs and engaged into the head channel, retaining the 15mm gap for deflection at the head. Support is provided by a Gypframe Channel transom. The door frame is secured to both Gypframe 'I' Stud and Gypframe Channel jambs and also to the transom member (see **Construction details – 22**).

Service penetrations
Penetrations of fire-resistant constructions for services need careful consideration to ensure that the integrity of the element is not impaired, and also that the services themselves do not act as the mechanism of fire spread.

Refer to **Service installations.**

Independent support
When designing for the installation of services such as fire dampers and associated ductwork through a **GypWall** partition, consideration should be given to the size and weight of the damper – this will determine whether it can be supported directly from the partition or needs to be independently supported from the structure.

Refer to **Service installations.**

Opening bridging studs
Openings should be constructed using channels for the trimming members. The web of the channel should be rebated to allow the flanges to oversail the stud. The flanges are secured with two fixings. Channels are cut and inserted to maintain the 25mm gap surround and fixed to the trimming channels (see **Construction details – 18**).

Opening between studs
The opening is constructed using channels for the trimming members. The web should be rebated and the flanges allowed to oversail the studs. The stud is secured with two fixings. Channels are cut and inserted with the webs folded to provide fixings. A plasterboard packer is inserted adjacent to the stud.

Electrical services
The positions for light switches and other electrical outlets should be pre-determined in order that provision can be made for support, and also for the fire integrity of the system. Gypframe 103 FC 50 Fixing Channel should be cut to bridge adjoining studs, with the edges flattened to permit fixing. The fixing channel should be backed with stone mineral wool. Gyproc FireStop linings should be cut to allow a close fitting entry of the switch box which can be secured to the fixing channel (see **Construction details – 7**). Back switch boxes with stone mineral wool to maintain fire integrity.

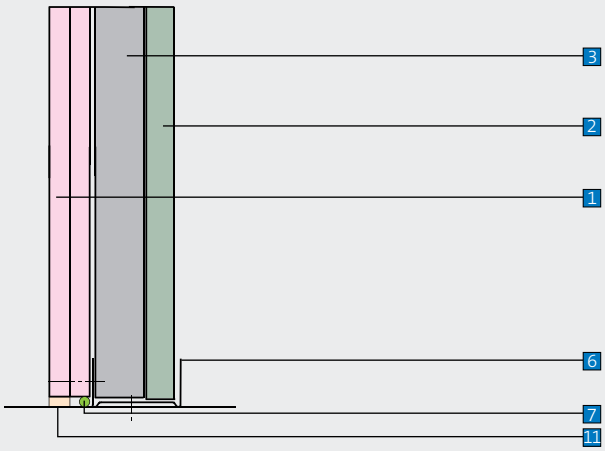
Horizontal ShaftWall
ShaftWall can be specified for horizontal applications as a free-spanning membrane with no support from the soffit. The membrane can be constructed entirely from below and can achieve spans up to 5100mm and fire resistance up to 120 minutes. A typical application is for fire escape corridors.

Supporting partitions should be of at least the same fire resistance period as the horizontal ShaftWall. Specifications for horizontal ShaftWall are complex and detailed, and therefore enquiries should be directed to the Gyproc Technical Team.

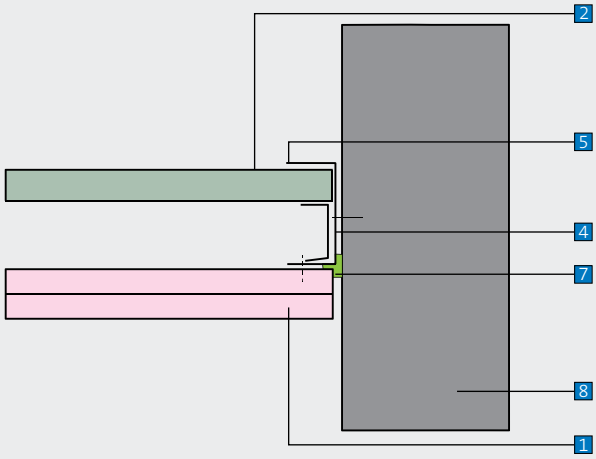
Board finishing
Refer to **Finishing systems**.

Construction details

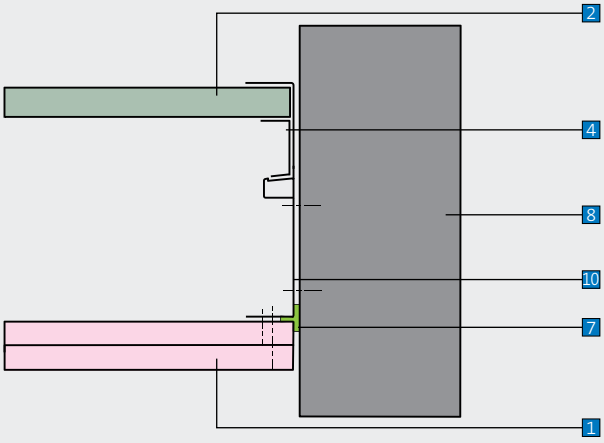
1 Base



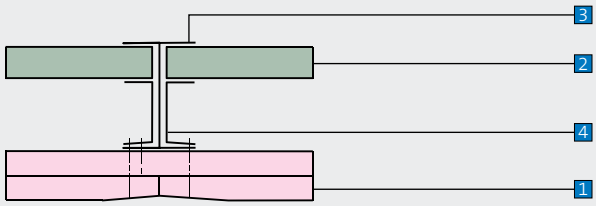
2 Junction with other elements



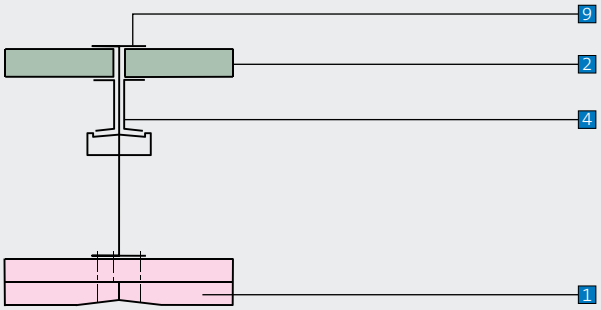
3 Junction with other elements (framework showing Gypframe Tabbed Starter Channel)



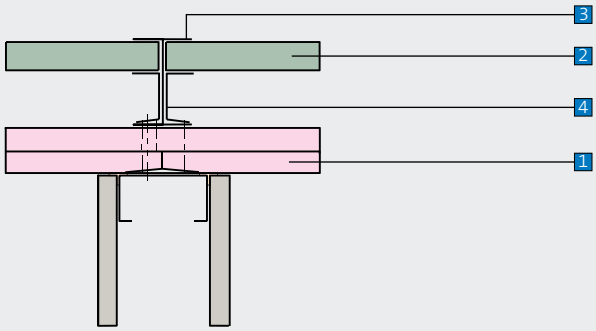
4 Intermediate stud



5 Intermediate stud (framework showing Gypframe Tabbed 'I' Stud)



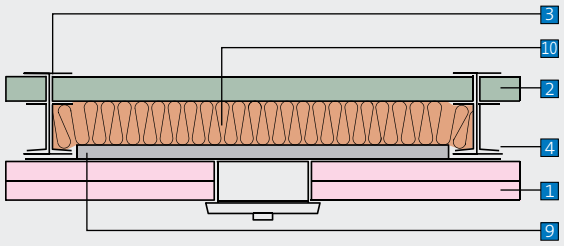
6 Partition junction (on-stud)

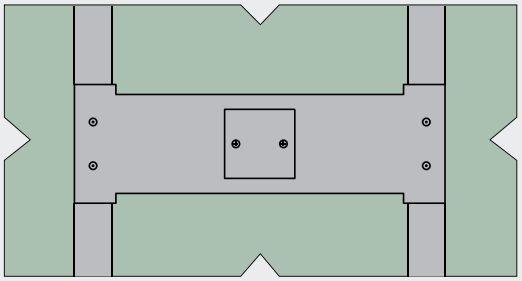


1 Gyproc FireStop
2 Gyproc CoreBoard
3 Gypframe 'I' Stud
4 Gypframe Retaining Channel
5 Gypframe Starter Channel
6 Gypframe Standard Floor & Ceiling Channel
7 Sealant
8 Structure
9 Gypframe 150 I 90 tabbed 'I' Stud
10 Gypframe 150 SC 90 tabbed Starter Channel
11 Bulk fill with Gyproc jointing materials (where gap exceeds 5mm)

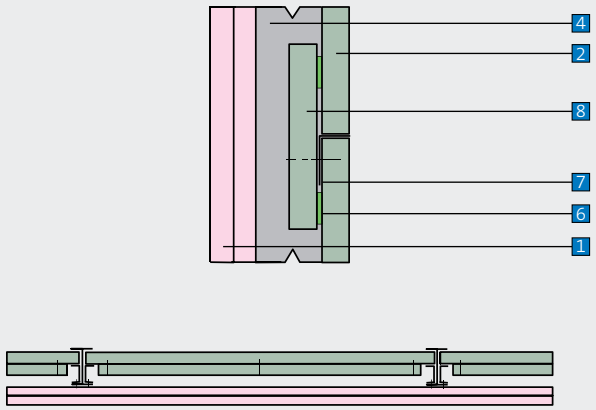
Construction details

7 Socket box

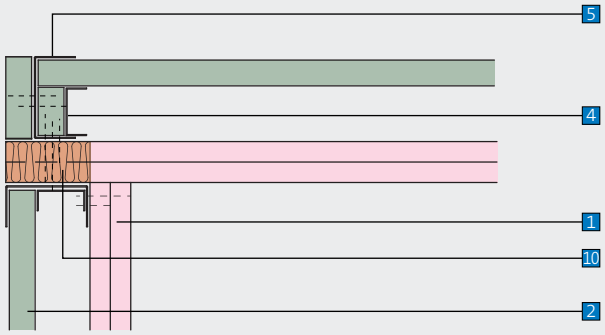




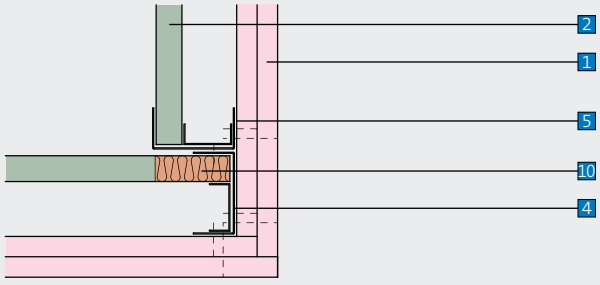
8 Horizontal Gyproc CoreBoard joints



9 Internal corner



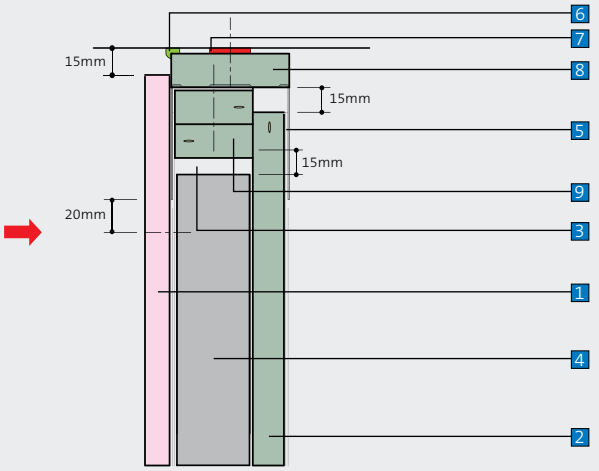
10 External corner



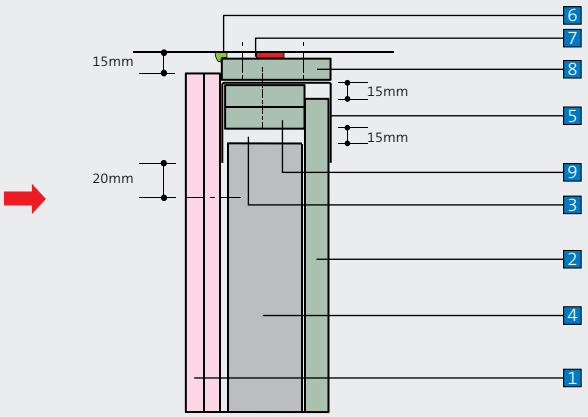
1 Gyproc FireStop
2 Gyproc CoreBoard
3 Gypframe 'I' Stud
4 Gypframe Retaining Channel
5 Gypframe Starter Channel
6 Sealant
7 Gypframe CoreBoard Joint Angle
8 Gyproc CoreBoard strip (cut on site)
9 Gypframe 103 FC 50 Fixing Channel
10 Stone mineral wool (by others)

Construction details

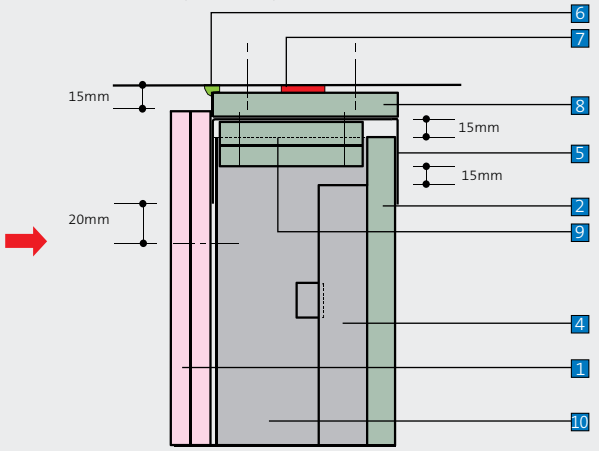
11 70mm framework (live loads)



12 100mm framework (live loads)



13 150mm framework (live loads)

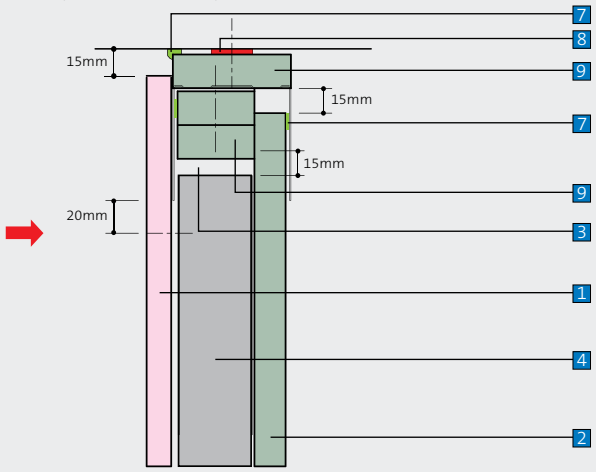


1 Gyproc FireStop
2 Gyproc CoreBoard
3 Gypframe 'I' Studs
4 Gypframe Retaining Channel
5 Gypframe Extra Deep Flange Floor & Ceiling Channel
6 Sealant
7 Firestrip
8 Gyproc CoreBoard as dropped soffit
9 Gyproc CoreBoard fire-stop
10 Gypframe 150 I 90 tabbed 'I' Stud

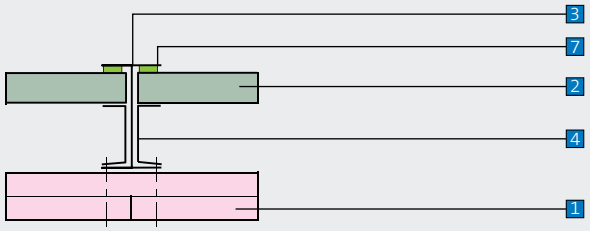
NB No fixings should be made through the boards into the flanges of the head channel. The arrow (➡) denotes the position of the uppermost board fixing.

Construction details

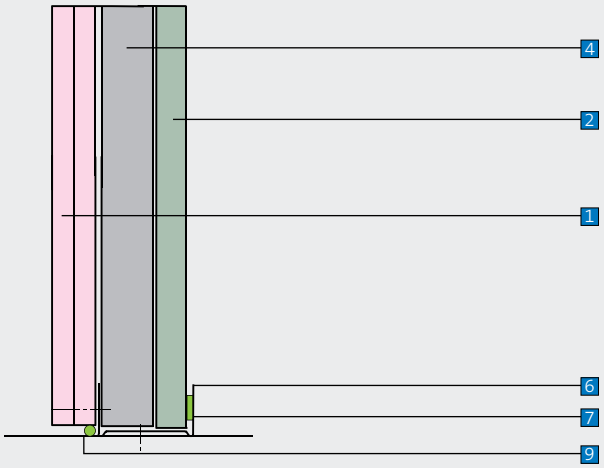
14 Head (sealed structure)



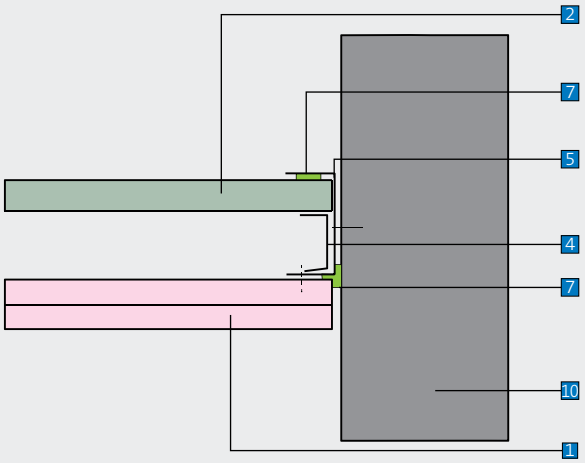
15 Intermediate stud (sealed structure)



16 Base (sealed structure)



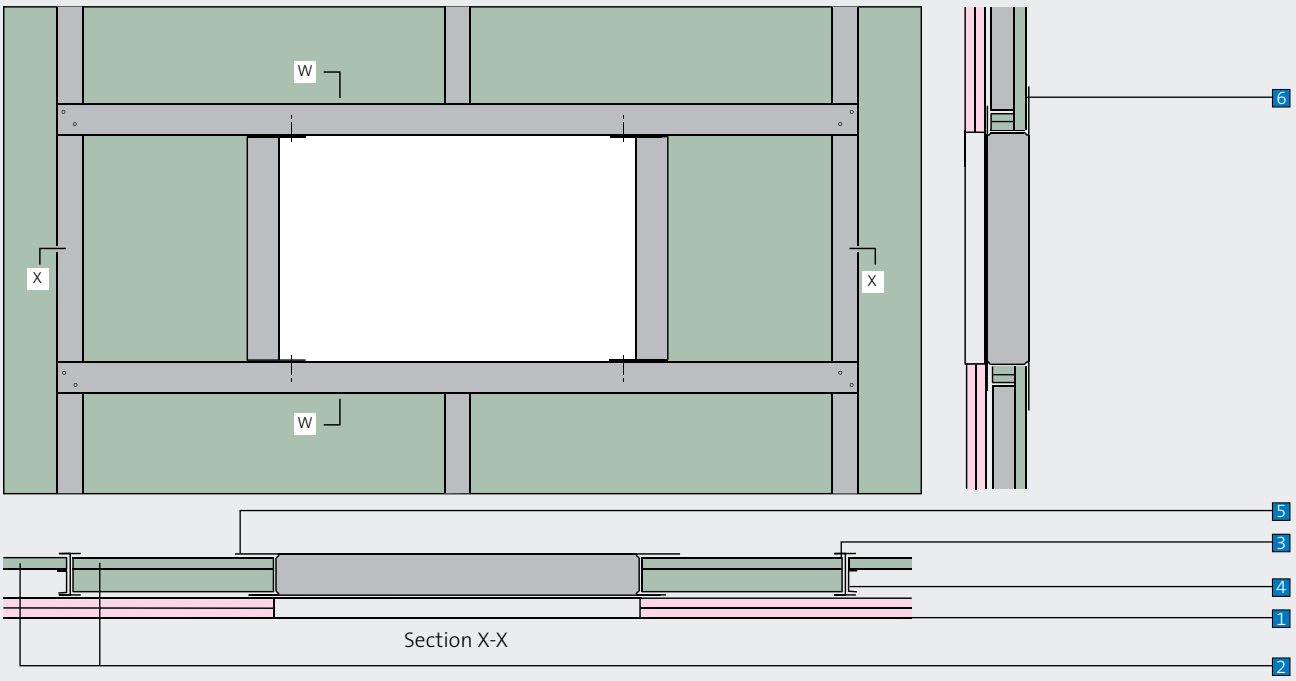
17 Junction with other elements (sealed structure)



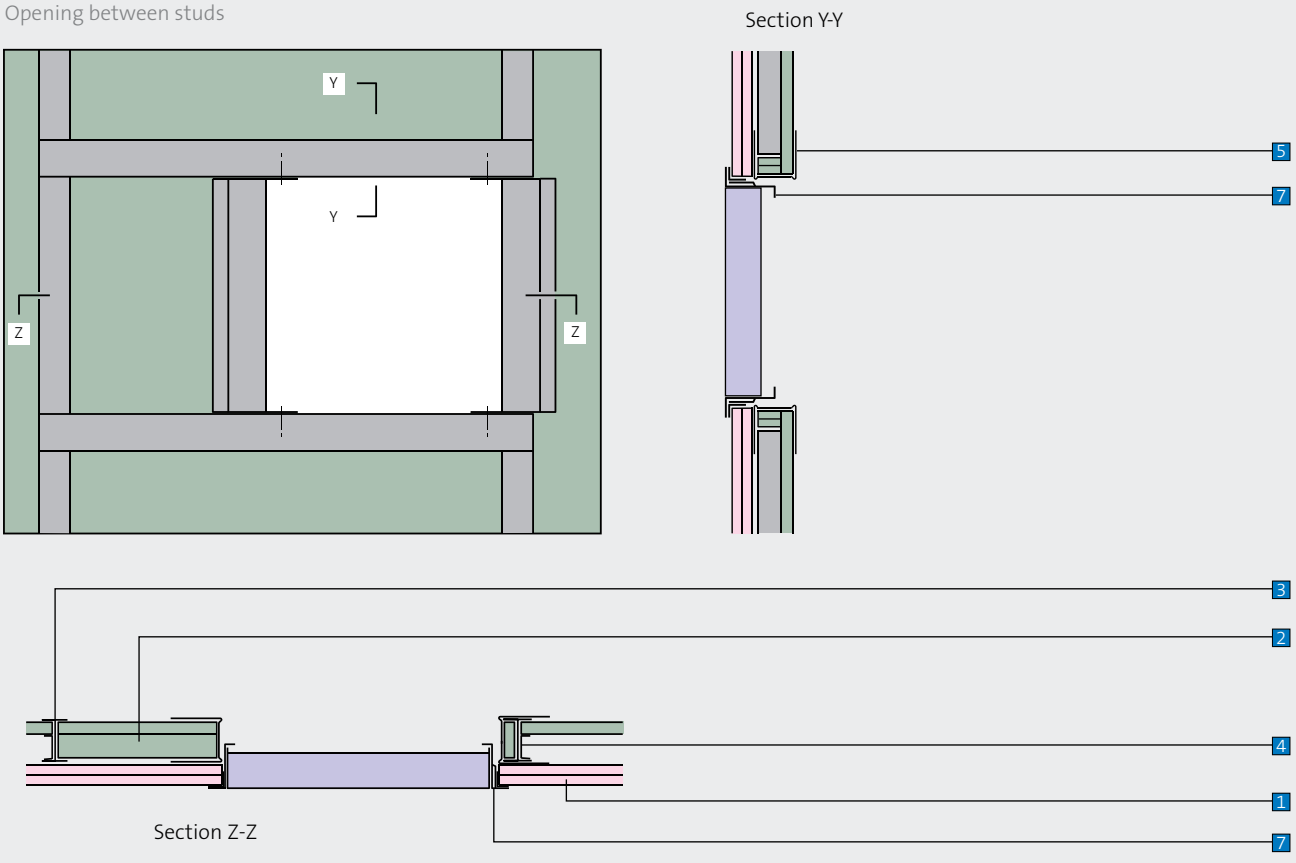
1 Gyproc FireStop
2 Gyproc CoreBoard
3 Gypframe 'I' Stud
4 Gypframe Retaining Channel
5 Gypframe Starter Channel
6 Gypframe Standard Floor & Ceiling Channel
7 Sealant
8 Firestrip
9 Gyproc CoreBoard fire-stop (cut on site)
10 Structure

Construction details

18 Opening bridging studs



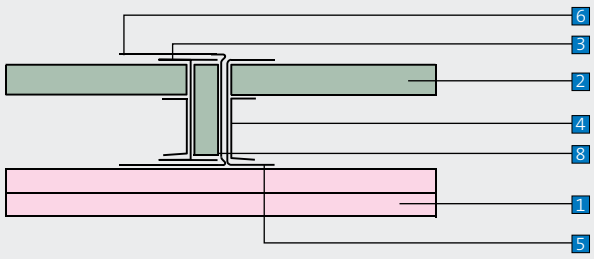
19 Opening between studs



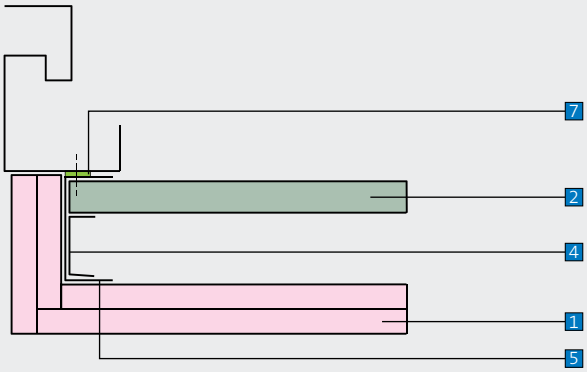
1 Gyproc FireStop
2 Gyproc CoreBoard
3 Gypframe 'I' Studs
4 Gypframe Retaining Channel
5 Gypframe Channel (to frame the opening)
6 Gyproc CoreBoard fire-stops (cut on site)
7 Access panel frame

Construction details

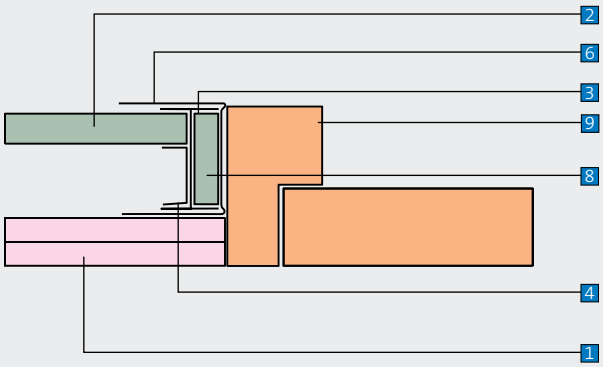
20 Access door - spandrel panel



Lift door (Gypframe Starter Channel mechanically fixed to frame) 21



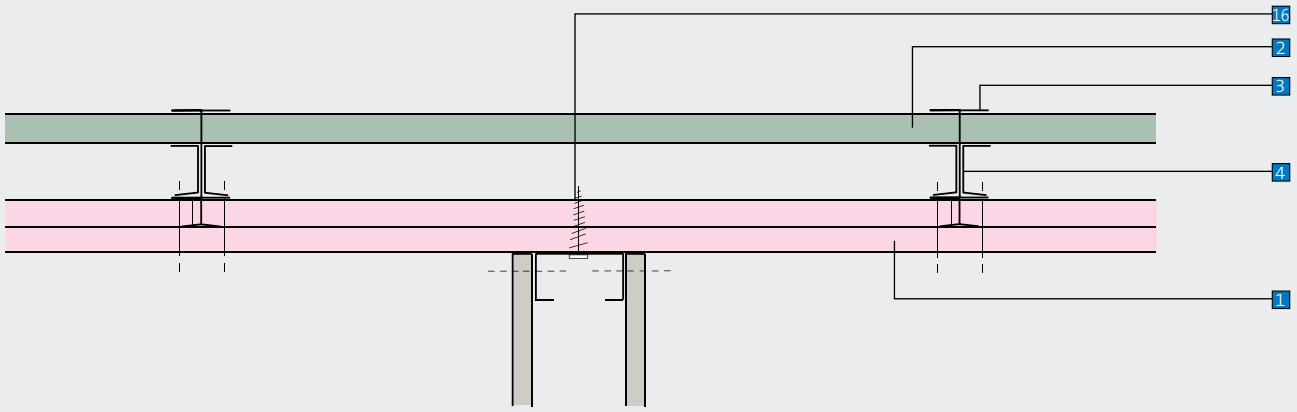
22 Access door jamb



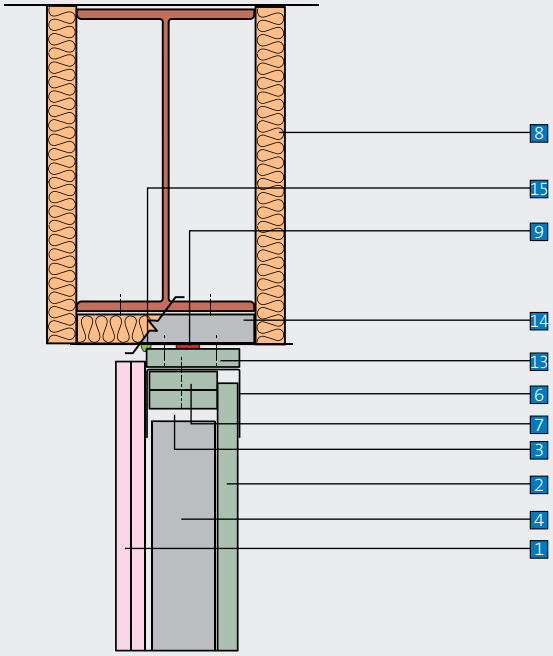
1 Gyproc FireStop
2 Gyproc CoreBoard
3 Gypframe 'I' Stud
4 Gypframe Retaining Channel
5 Gypframe Starter Channel
6 Gypframe Channel
7 Sealant
8 Gyproc CoreBoard packer (cut on site)
9 Door frame

Construction details

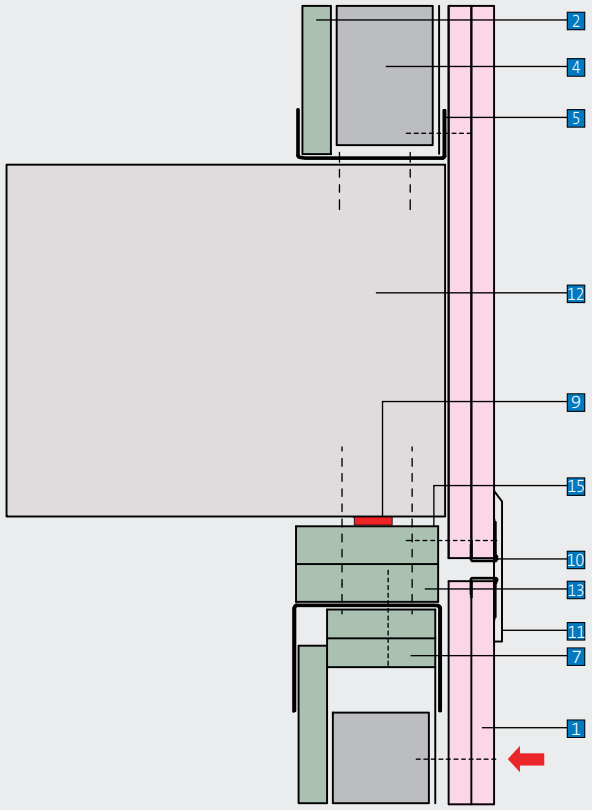
23 Retro-fit non-performance partition junction



24 Fixing head channel to Z-section at underside of beams



25 Movement joint at floor slab junction where lining boards continue



1 Gyproc FireStop
2 Gyproc CoreBoard
3 Gypframe 'I' Stud
4 Gypframe Retaining Channel
5 Gypframe Floor & Ceiling Channel
6 Gypframe Extra Deep Flange Floor & Ceiling Channel
7 Gyproc CoreBoard fire-stops
8 Beam encasement
9 Firestrip
10 Edge Bead - if no cover strip is used
11 Cover strip (by others)
12 Structure
13 Gyproc CoreBoard as dropped soffit
14 Z-section
15 Sealant by others
16 Suitable metal self-drive fixing (by others)

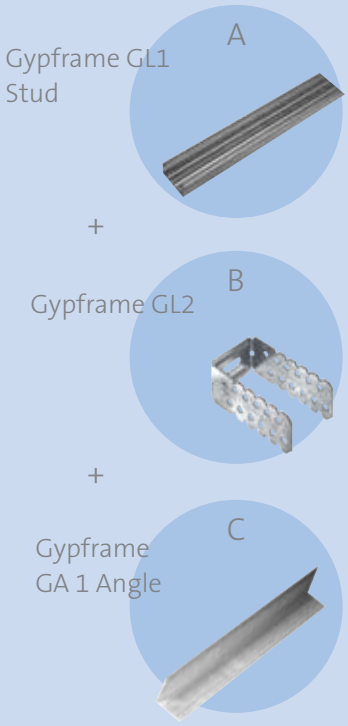
NB No fixings should be made through the boards into the flanges of the head channel. The arrow (➡) denotes the position of the uppermost board fixing.

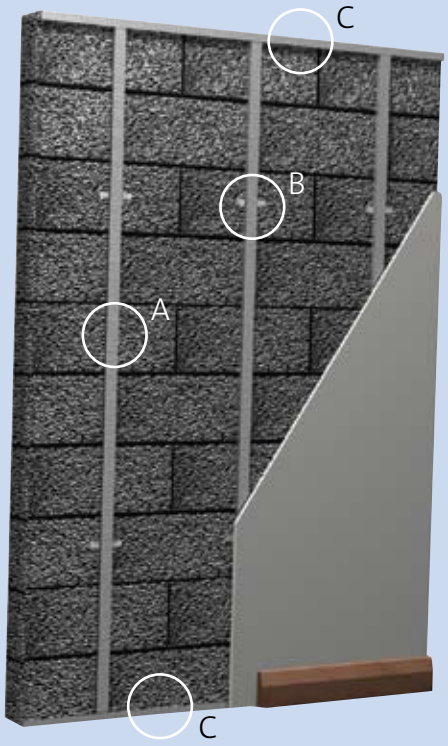

Bournville Place

GypLyner UNIVERSAL

49 – 66 R_w dB

GypLyner UNIVERSAL wall lining system is a cost-effective, virtually independent metal frame drylining. It is a general purpose system that is suitable for all internal non-loadbearing applications.





Key facts

- Commonality of ceiling and wall lining components • General purpose lining
- Minimal connection to the structure • Overcomes difficulties of background irregularities
- Can satisfy thermal performance and acoustic requirements • Provides service void of 25mm - 75mm
- Ideal for refurbishing existing walls where:
  - Wall surface quality is poor
  - Acoustic or thermal upgrades are required
  - A cavity is required to accommodate services, such as water and waste pipes

Applications

Due to the design flexibility of GypLyner UNIVERSAL, this system can be tailored to meet the requirements of a wide range of applications.

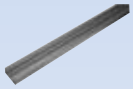
Sector

✓ Office / commercial ✓ Retail ✓ Sport and leisure ✓ Education ✓ Apartment buildings

✓ High-rise multi-occupancy ✓ Healthcare ✓ Industrial ✓ Housing

System components

Gypgrame metal products



GL1 Stud — **Length** 3000

GL2 Bracket
For maximum 75mm stand-off from wall
Length 75mm

GFS1 Fixing Strap — **Length** 3000mm

GA1 Angle — **Length** 3000mm

Board products

Gyproc Regular Board
Thickness 12.5, 15mm
Width 1200mm

Gyproc Moisture Resistant
Thickness 12.5, 15mm
Width 1200mm

Gyproc DuraLine[1]
Thickness 15mm
Width 1200mm

1 Moisture resistant (MR) version of the above board is specified in intermittent wet use areas, e.g. shower cubicles.

Fixing and finishing products

Gyproc Wafer Head Drywall Screws
For Gypframe metal-to-metal fixing less than 0.8mm thick

Gyproc Drywall Screws
For fixing boards to Gypframe metal framing less than 0.8mm thick.

Gyproc Jointing Compound
For seamless jointing.

Gyproc Paper Tape
For joint reinforcement.

Gyproc Fibre Tape
For joint reinforcement.

Insulation products

Isover Acoustic Partition Roll
25mm or 50mm for improved acoustic performance.

Eligible for the SpecSure warranty from Gyproc

Installation overview

The required cavity depth up to a maximum of 75mm is determined, and chalk lines marked to floor and ceiling to indicate positioning of the Gypframe GA1 Angle. Gypframe GA1 Angle is fixed to perimeters using appropriate fixings. Vertical lines are marked on the wall at appropriate intervals to indicate Gypframe GL2 fixing centres. Horizontal lines are marked at appropriate centres to determine individual bracket positions. Brackets are then fixed into position.

Gypframe GL1 Studs are screw fixed using Gyproc Wafer Head screws to the GA1 Angle at the head and base. Bracket legs are bent forward and each leg fixed to the Gypframe GL1 Studs. The protruding bracket legs are bent back to sit clear of the channel face.

At internal angles, a Gypframe GL1 Stud is positioned tight into the corner to provide support for the lining. Boards are fixed to all framing members.

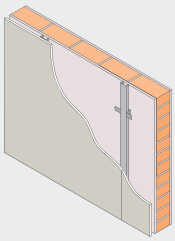
Openings

Gypframe GL1 Stud is positioned either side of the door opening and fixed to the Gypframe GA1 Angle at head and base. A section of Gypframe GA1 Angle is cut and bent to form the head of the opening. A short length of Gypframe GL1 Stud is positioned midway above the opening to provide additional support. At window openings, an edge bead is fixed to the perimeter of the window frame to protect and retain the lining. See Construction details – 5.

Performance (▶ Refer to Basic principles of system design)

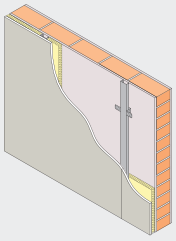
Table 3 – GypLyner UNIVERSAL refurbishment - upgrading sound insulation of solid internal walls

1



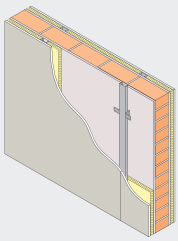
Solid brick wall (103mm) with 13mm plaster each side and Gypframe GL1 Lining Channel framework fixed to **one** side to give 35mm cavity.
Lining as in table.

2



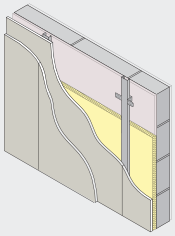
Solid brick wall (103mm) with 13mm plaster each side and Gypframe GL1 Lining Channel framework fixed to **one** side to give 35mm cavity. Cavity filled with 25mm Isover APR 1200.
Lining as in table.

3



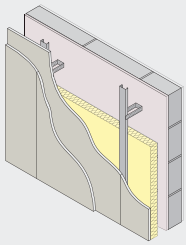
Solid brick wall (103mm) with 13mm plaster each side and Gypframe GL1 Lining Channel framework fixed to **both** sides to give 35mm cavities. Cavities filled with 25mm Isover APR 1200.
Linings as in table.

4



Solid block wall, of mass 200kg/m², with 13mm plaster each side. Gypframe GL1 Lining Channel framework fixed to **one** side to give 35mm cavity. Cavity filled with 25mm Isover APR 1200.
Linings as in table.

5



Solid block wall, of mass 200kg/m², with 13mm plaster each side. Gypframe GL1 Lining Channel framework fixed to **one** side to give 85mm* cavity. Cavity filled with 50mm Isover APR 1200.
Linings as in table.

* For fixing details contact the Gyproc Technical Team

Detail	Board type	Lining thickness mm	Sound insulation R_w (R_w + Ctr) dB	Improvement over existing wall R_w (R_w + Ctr) dB	System reference
1	Regular	1 x 15	49 (43)	+2 (-1)	B226009
2	Regular	1 x 15	57 (50)	+10 (+6)	B226008
3	Regular	1 x 15	60 (42)	+13 (-2)	B226010
4	Regular	1 x 15	57 (50)	+10 (+6)	B226008
4	Regular	2 x 15	60 (55)	+13 (+11)	B226003
5	Regular	1 x 15	64 (56)	+17 (+12)	B226007
5	Regular	2 x 15	66 (59)	+19 (+15)	B226005

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc's recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

Design

Planning - key factors
The depth of the cavity is determined by the positioning of the fixing brackets. Allow for a stand-off of 25mm - 75mm plus the lining thickness for Gypframe GL2 Brackets. The stand-off will determine the lining dimension required at door and window reveals and soffits. Ceilings should be installed prior to installing GypLyner UNIVERSAL wall linings. Any abutting partitions should also be installed prior to drylining.

Cavity barriers
Building regulations may require the provision of vertical cavity barriers to long runs of lining. Minimum 12.5mm plasterboard, cut to cavity depth and screw-fixed to the leg of Gypframe GL1 Lining Channel, will provide a satisfactory cavity barrier.

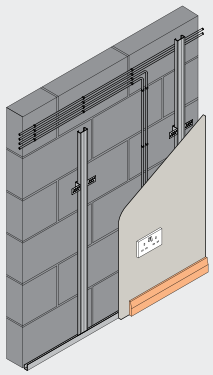
Thermal performance
Uncontrolled air movement through the drylining cavity can result in loss of cooling energy from the building. Optimum thermal performance for GypLyner UNIVERSAL wall lining is achieved using a sealed and insulated cavity between the lining and the background. This is achieved in practice if the abutting elements and the background are well fitted, and all junctions are sealed.

When the perimeter of the cavity is to be sealed by the drylining contractor, the recommended method is to closely fit the plasterboard lining and apply a continuous fillet / ribbon of sealant to the perimeter of the external wall and around any openings.

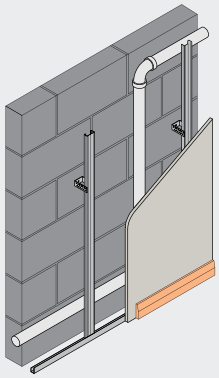
Wall lining rigidity
Brackets should be positioned equidistant at maximum 800mm vertical centres. Where there is a requirement for increased rigidity, these support centres should be reduced accordingly, although acoustic performance may be downgraded.

Services
The cavity between the metal framework and the background facilitates the incorporation of services. Pipes and conduits should be fixed in position before installing the framing.

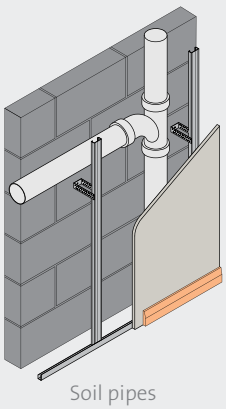
Refer to Service installations.



Cabling



Water and waste pipes



Soil pipes

Fixtures

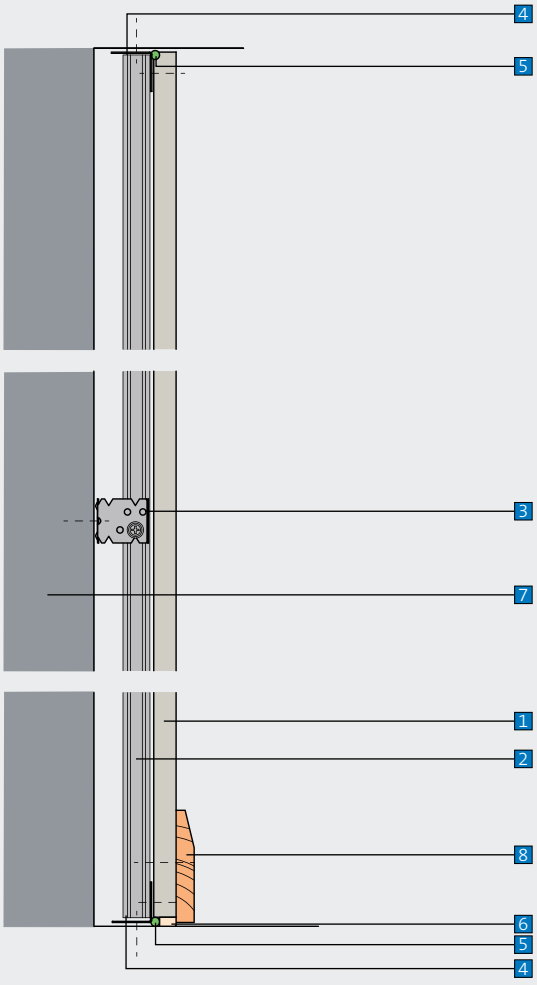
Lightweight fixtures can be made directly to the lining. Medium weight fixtures should be made to Gypframe 103 FC 50 fixing channel. Heavyweight fixtures (to BS 5234), such as wash basins and wall cupboards, can be fixed using Gypframe 103 FC 90 fixing channel.

Refer to Service penetrations and fixing into drywall systems.

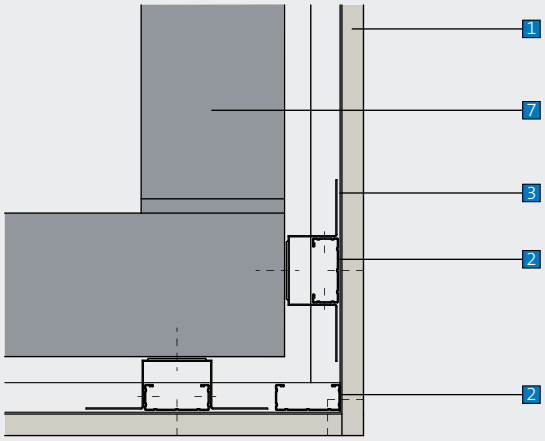
Board finishing
Refer to Finishing systems.

Construction details

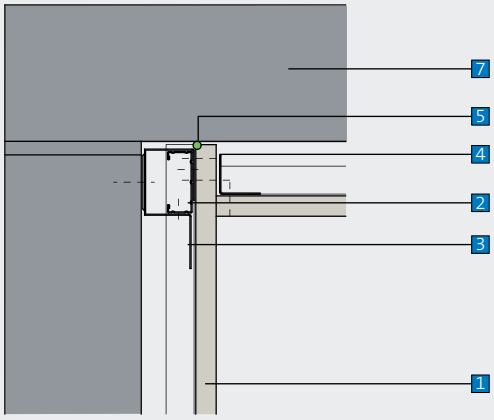
1 Head and base



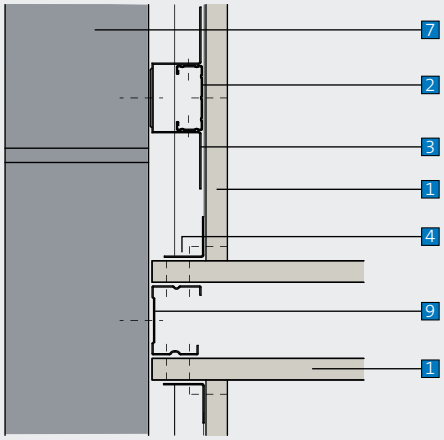
2 External angle



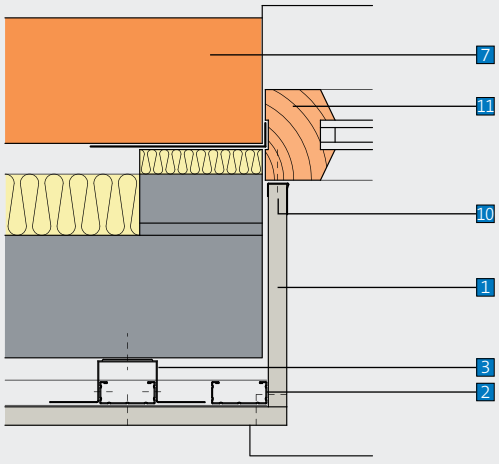
3 Internal angle



4 Partition junction



5 Window reveal



1 Gyproc plasterboard
2 Gypframe GL1 Lining Channel
3 Gypframe GL2 Bracket
4 Gypframe GA1 Angle
5 Sealant
6 Bulk fill with Gyproc jointing materials (where gap exceeds 5mm)
7 Wall structure
8 Skirting
9 Gypframe 'C' Stud
10 Drywall edge bead from others
11 Window frame

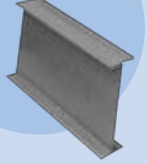
GypLyner IWL

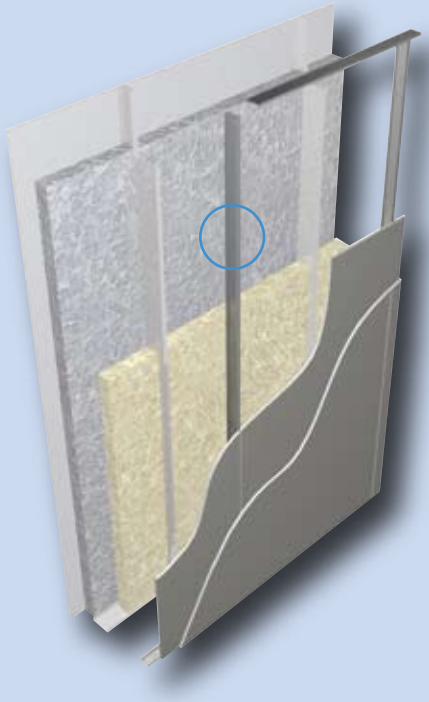
59 – 61 R_w dB

30 – 90 mins

GypLyner IWL independent wall lining is a lightweight, non-loadbearing system, which is built independently of the external wall construction. The system is used in all types of building, but is particularly suitable for those with reinforced concrete or steel frames. The lining provides fire resistance to structural steel sections clad with lightweight metal sheeting, and can also be used in association with new or existing masonry walls to increase sound insulation and meet thermal performance requirements.

Gypframe
'I' Stud





Key facts

- Fully independent wall lining
- Compatable with external wall constructions including curtain walling, rainscreen claddings, industrial claddings, brickwork and glazed atria
- Used to line non fire-rated service risers
- Used horizontally to form a corridor ceiling
- Satisfies BS 5234 requirements up to and including Severe Duty[1]
- Provides fire protection to structural steelwork
- Provides fire resistance in association with external structure
- Used to upgrade the sound and thermal performance of an existing masonry wall
- Provides service void

1 Refer to section Principles of robust design.

Applications

Due to the design flexibility of GypLyner IWL this system can be tailored to meet the requirements of a wide range of applications.

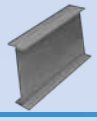
Sector

- ✓ Office / commercial
- ✓ Retail
- ✓ Sport and leisure
- ✓ Education
- ✓ Healthcare
- ✓ Industrial
- ✓ Housing
- ✓ Apartment buildings
- ✓ High-rise multi-occupancy

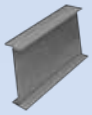
GypLyner IWL

System components

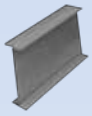
Gypframe metal products



70 I 70 — **Length** 3000mm

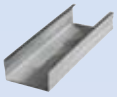


100 I 80 — **Length** 3000mm



150 I 90 — **Length** 3000mm

For abutments and openings only

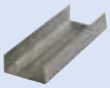


Equivalent 'C' Studs

70 S 50 — **Length** 3000mm

100 S 50 — **Length** 3000mm

150 S 50 — **Length** 3000mm



Standard Floor & Ceiling Channels
72 C 50
102 C 50
152 C 50

Deep Flange Floor & Ceiling Channels
72 DC 60
102 DC 60
152 DC 60

Extra Deep Flange Floor & Ceiling Channels
72 EDC 80
102 EDC 80
152 EDC 80

All channels are available in 3000mm.

GFS 1 Fixing Strap — **Length** 3000mm

103 FC 50 Fixing Channel — **Length** 3000mm

Board products

Gyproc Regular
Thickness 12.5, 15mm
Width 1200mm

Gyproc Moisture Resistant
Thickness 12.5, 15mm
Width 1200mm

Gyproc FireStop[1]
Thickness 12.5, 15mm
Width 1200mm

Gyproc DuraLine[1]
Thickness 15mm
Width 1200mm

1 Moisture resistant (MR) versions of the above boards are specified in intermittent wet use areas, e.g. shower cubicles.

Fixing and finishing products

Gyproc Wafer Head Drywall Screws
For Gypframe metal-to-metal fixing less than 0.8mm thick

Gyproc Drywall Screws
For fixing boards to Gypframe metal framing less than 0.8mm thick.

Gyproc Jointing Compound
For seamless jointing.

Gyproc Paper Tape
For joint reinforcement.

Gyproc Fibre Tape
For joint reinforcement.

Insulation products

Isover Acoustic Partition Roll
50mm for improved acoustic and thermal performance.

Eligible for the SpecSure warranty from Gyproc

Installation overview

Gypframe Floor & Ceiling Channels are fixed at the head and base. Gypframe 'I' Studs are friction-fitted vertically within the channel sections to form the framework. This allows for adjustment during boarding. If specified, Isover insulation is fitted between studs. Additional framing is installed as required to support heavy fixtures.

Boards are screw-fixed to framing members to form the lining. Horizontal board joints should be backed with Gypframe GFS1 Fixing Strap.

Services
Electrical and other services are normally installed at the frame erection stage. Horizontal runs are fixed to the background or can be routed through cut-outs in the studs. Gypframe 103 FC 50 Fixing Channel can be installed between studs to support recessed switch boxes/socket outlets.

GypLyner IWL

Performance (►Refer to Basic principles of system design)

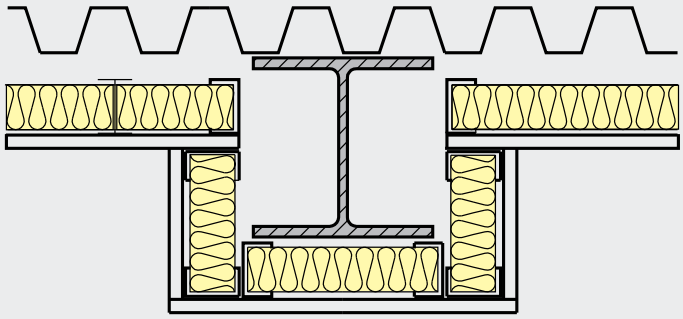
Table 1 – GypLyner IWL maximum heights[1] for Gypframe 'I' Studs at 600mm centres

Stud type	12.5mm boards maximum heights		12.5mm boards maximum heights	
	single mm	double mm	single mm	double mm
70 I 70	3600	4200[2]	3900	4300[2]
100 I 80	5100[2]	5700[2]	5400[2]	6000[2]
150 I 90	6900[2]	7200[2]	7200[2]	7500[2]

1 Based on a limiting deflection of L/240 at 200 Pa. Greater heights can be achieved by reducing stud centres. Contact Gyproc Technical Team for further advice.
2 For heights between 4200mm and 8000mm, Gypframe Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to defiection criteria).

Table 2 – GypLyner IWL linings to steel clad external walls[1]. Solutions to satisfy the requirements of BS EN 1364-1: 1999 and BS 476: Part 22: 1987

1



Board linings to one side of Gypframe 'I' Stud framework and 50mm Isover Insulation forming an independent lining to structural steel columns, in association with external steel cladding. Linings as in table.

Detail	Board type[3]	Lining thickness mm	Duty rating	System reference
	Fire resistance – 30 minutes integrity[2] : 30 minutes insulation[2] BS			
1	Regular	2 x 12.5	Severe	B216003
1	Regular	2 x 15	Severe	B216004
	Fire resistance – 60 minutes integrity[2] : 30 minutes insulation[2] BS			
1	FireStop	1 x 12.5	Medium	B216025
1	FireStop	1 x 15	Heavy	B216026
	Fire resistance – 90 minutes integrity[2] : 30 minutes insulation[2] BS			
1	FireStop	2 x 12.5	Severe	B216027
1	FireStop	2 x 15	Severe	B216028

1 The fire resistances apply to external walls, whose construction incorporates structural steel sections with a profiled steel cladding, when the inside of the wall is exposed to fire.
2 The figures quoted relate to the complete wall structure including the external cladding. The lining also offers fire protection to steel columns from the lining side, subject to A/V (Hp/A) factor. Refer to Table 3.
3 For improved durability and impact resistance, the outer layer of board can be replaced with a layer of Gyproc DuraLine.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc's recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

GypLyner IWL

Performance (▶ Refer to Basic principles of system design)

Table 3 – GypLyner IWL fire protection to structural steel Solutions to satisfy the requirements BS 476: Part 21: 1987

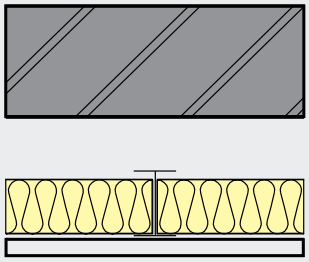
Board type	Lining thickness mm	Fire protection mins	Section factor[1] A/V (Hp/A) m^{-1}
FireStop	1 x 12.5	30	Up to 300
FireStop	1 x 12.5	60	Up to 165
DuraLine	1 x 15	30	Up to 300
Regular	2 x 12.5	30	Up to 300
FireStop	2 x 12.5	60	Up to 300
FireStop	2 x 12.5	90	Up to 200
FireStop	2 x 15	90	Up to 300

1 Based on four-sided exposure. Protection is afforded to universal column sections as described in BS 4: Part 1. Based on critical temperature 550°C (information on other critical temperatures is available).

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc's recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc .

Table 4 – GypLyner IWL linings to masonry construction Solutions to satisfy the requirements of BS 476: Part 21: 1987

1



Single or double layer board to one side of Gypframe 'I' Stud framework and 50mm Isover insulation forming an independent lining to masonry construction with a sealed surface mass of 178 kg/m² (minimum). Linings as in table.

Detail	Board type	Lining thickness mm	Sound insulation R_w (R_w + C_{tr}) db	Duty rating	Approx. weight kg/m²	System reference
	180 minutes fire resistance[1] BS					
1	Regular	1 x 12.5	59 (51)	Medium	11	B216001
1	Regular	1 x 15	59 (51)	Medium	13	B216002
1	Regular	2 x 12.5	61 (54)	Severe	20	B216031
1	Regular	2 x 15	61 (54)	Severe	23	B216033

1 The fire resistance quoted is that provided by the masonry wall without contribution from the lining.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc's recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

Design

Planning - key factors
The position of services should be pre-determined and their installation planned into the frame erection stage. It is important that all parts of the lining system, including the insulation, should remain independent of the external walling. The lining is erected with the external walling in place and the windows and doors fixed.

Extended heights
Where the wall height exceeds the available length of the 'I' stud, sections of stud can be spliced together to the required length using 600mm lengths of the appropriate floor and ceiling channel, fixed with four Gyproc Wafer Head Drywall Screws in each flange to each side, (**see Construction details – 2**). Where greater heights than listed in **Table 1** are required, it may be possible to brace the lining back to the structure. Note that the system is non-loadbearing and should not be used to provide lateral restraint to masonry or other external wall constructions.

Acoustic performance
GypLyner IWL can be used as an independent lining to improve the sound insulation of new or existing masonry walls. Acoustic testing on a basic masonry wall construction achieving Rw 45 dB sound insulation gave a 14 dB improvement when the wall was lined with **GypLyner IWL** (single board). A 16 dB improvement was achieved with a double layer lining. Please see **Table 4**. Special detailing is required at junctions with sound insulating partitions in order to maintain acoustic performance, (**see Construction details – 5**).

Fixing floor and ceiling channels
Gypframe Floor & Ceiling Channels must be securely fixed with a row of fixings at 600mm maximum centres. For 102mm channels and above, two rows of staggered fixings are required, each row at 600mm centres and each fixing 25mm in from the flange. If the
floor is uneven, a 38mm thick timber sole plate equal to the width of the channel should be used.

If the concrete or screeded floor is new, consideration should be given to the installation of a damp-proof membrane between the floor surface and the channel or sole plate.

Deflection heads
The system can accommodate deflection at the head with suitable detailing incorporating Gypframe Deep Flange or Extra Deep Flange Floor & Ceiling Channels. Contact the Gyproc Technical Team for further guidance.
Refer to Principles of building acoustics.

Thermal performance
Uncontrolled air movement through the drylining cavity can result in loss of cooling energy from the building. This can be reduced in practice if the abutting elements and the background are well fitted, and junctions are sealed.

The designer should also specify a method of restricting air movement around the perimeter of suspended timber floors, such as the provision of a flexible seal between the floor and walls.

Services
The stud cut-outs can be used for services provided that the Isover insulation remains in place. The positioning of stud cut-outs is shown in **Construction details – 1**.

Surface mounted services should be located against the plasterboard lining, and fixed through the lining to the stud framework. Any interruptions in the lining integrity will downgrade its performance. The installation of electrical services should be carried out in accordance with BS 7671.

Refer to Service installations.

Fixtures
Lightweight fixtures can be made directly to the partition linings. Medium weight fixtures can be made to Gypframe 103 FC 50 Fixing Channel. Heavyweight fixtures (to BS 5234), such as wash basins and wall cupboards, can be fixed using Gypframe 103 FC 90 Fixing Channel.

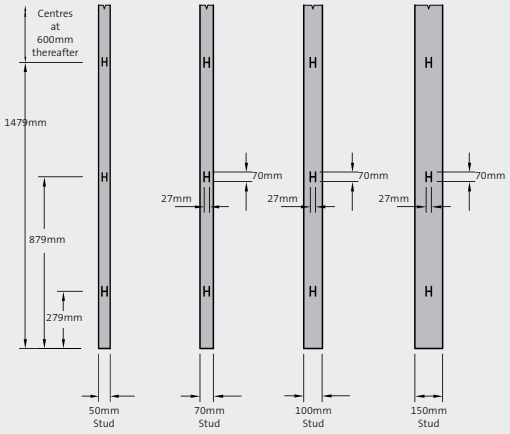
Refer to Service Installations.

Board finishing

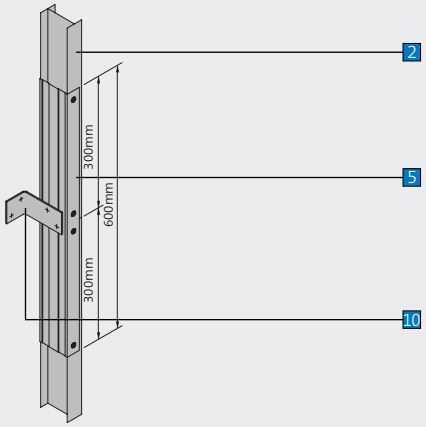
Refer to Finishing systems.

Construction details

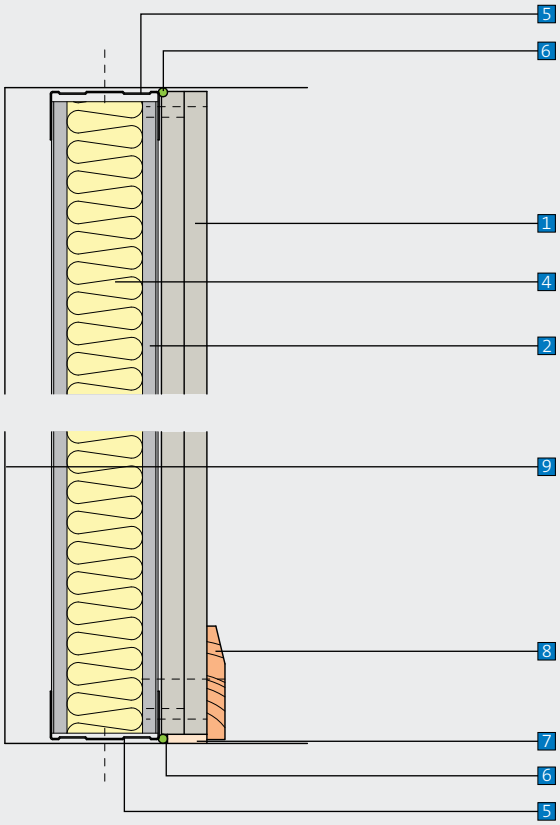
1 Service cut-outs - Gypframe 'C' Studs and Gypframe 'I' Studs



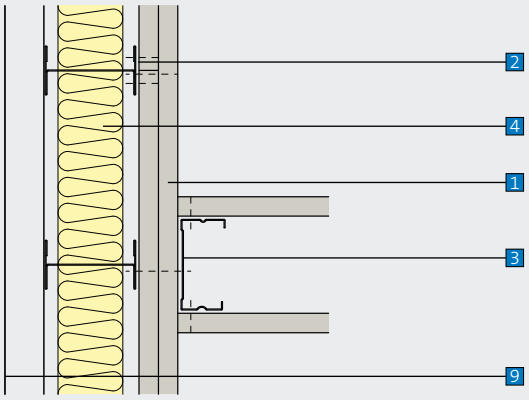
2 Gypframe 'I' Stud / splicing and bracing



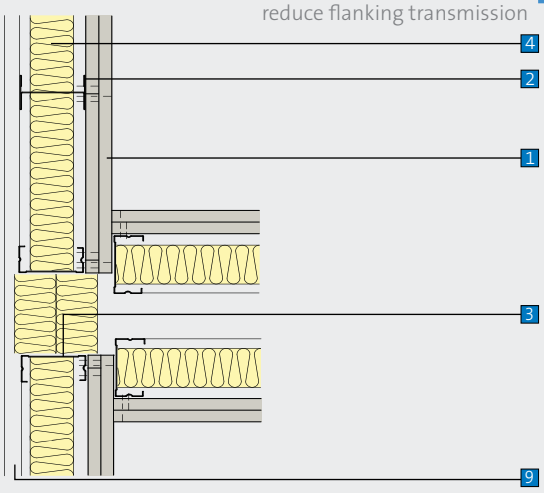
3 Head and base



4 Partition junction

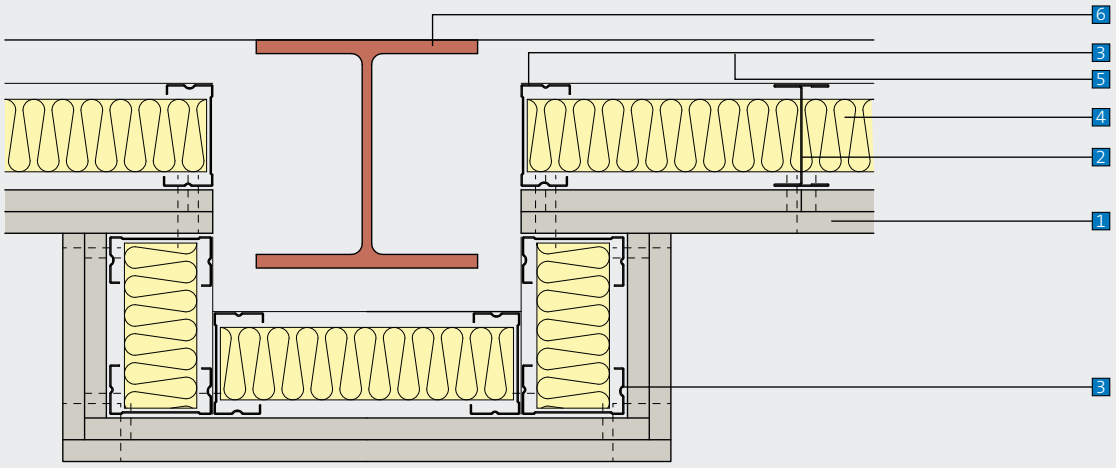


5 Partition junction to optimise acoustic performance and reduce flanking transmission

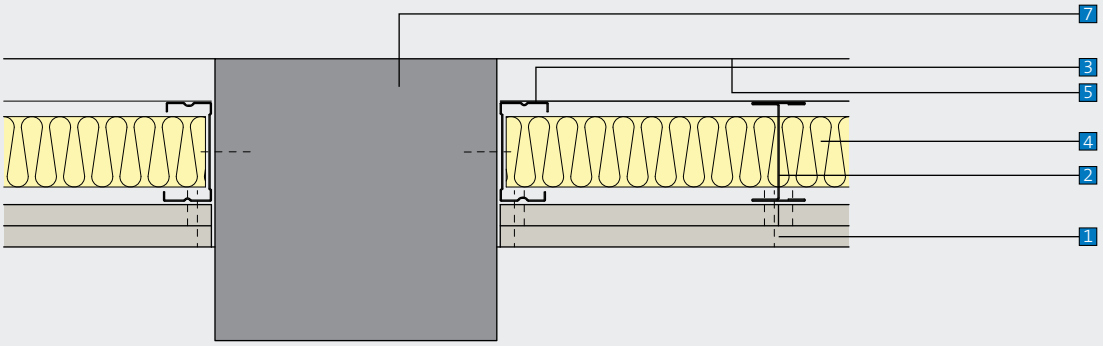


1 Gyproc plasterboard
2 Gypframe 'I' Stud
3 Gypframe 'C' Stud
4 Isover insulation
5 Gypframe Standard Floor & Ceiling Channel
6 Gyproc Sealant
7 Bulk fill with Gyproc jointing materials (where gap exceeds 5mm)
8 Skirting
9 Wall structure
10 Suitable size angle brace by others

6 Lining around steel column



7 Concrete column junction



1 Gyproc plasterboard
2 Gypframe 'I' Stud
3 Gypframe 'C' Stud
4 Isover insulation
5 Wall structure
6 Steel column
7 Concrete column

Gyproc MF

Concealed grid MF Suspended ceiling system

Gyproc MF

0.40 – 0.75 NRC Sound absorption

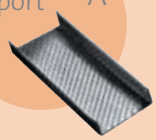
57 – 64 R_w dB Airborne

67 – 57 L_{nw} dB Impact

30 – 120 mins

Gyproc MF is a suspended ceiling system suitable for most internal drylining applications. The fully concealed grid and ceiling lining can be used in conjunction with Gyproc plasterboards and Gyptone boards to create a seamless, monolithic appearance.

Gypframe MF7 Primary Support Channel A



+

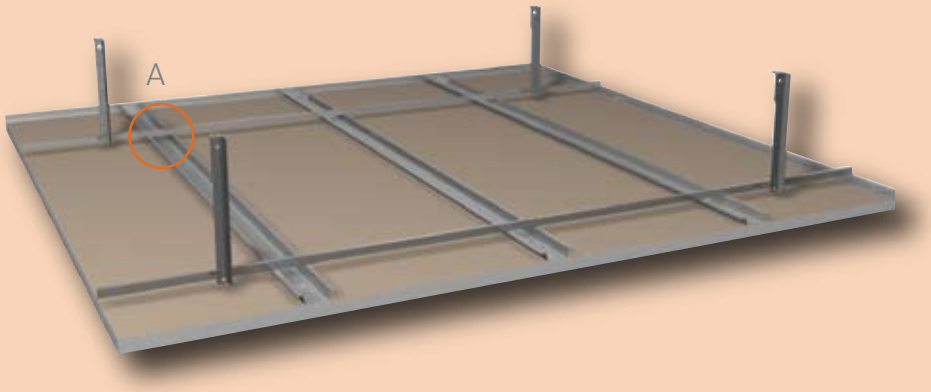
Gypframe GA1 Perimeter Support Angle

+

Gyproc Wafer Head Jack-Point Screws

+

Gypframe MF5 Ceiling Section



Key facts

- Monolithic appearance
- Suspension from concrete floors and purlins
- Durable ceiling lining
- Ventilation ducts and other services accommodated in plenum
- Simple accommodation of access panels
- Easy to create bulkheads and level change

Applications

A wide range of residential and commercial applications.

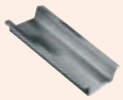
Sector

✓ Education ✓ Healthcare ✓ Apartment buildings ✓ High-rise multi-occupancy

Gyproc MF

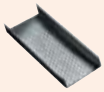
System components

Gypgrame metal products



MF5 Ceiling Section
Secondary section below Gypframe MF7 Primary Support Channel.

Length
3000mm



MF7 Primary Support Channel
Primary support section.

Length
3000mm

GA1 Steel Angle

Length
3000mm

Board products

Gyproc Regular
Thickness
Width

12.5, 15mm
1200mm

Gyproc Moisture Resistant
Thickness
Width

12.5, 15mm
1200mm

Gyproc FireStop[1]
Thickness
Width

12.5, 15mm
1200mm

1 Moisture resistant (MR) version of the above boards is specified in intermittent wet use areas, e.g. shower cubicles.

Fixing and finishing products

Gyptone Access Panels
To integrate with the Gyptone range of ceiling boards - LINE 6, QUATTRO 41, 46 and 47.

Gyproc Wafer Head Drywall Screws
For Gypframe metal-to-metal fixing less than 0.8mm thick.

Gyproc Wafer Head Jack-Point Screws
For fixing hanger to Gypframe MF7 Primary Support Channel, and for fixing Gypframe MF5 Ceiling Section to Gypframe MF7 Primary Support Channel.

Gyproc Drywall Screws
For fixing boards to Gypframe metal framing less than 0.8mm thick.

Gyproc Jointing Compound
For seamless jointing.

Gyproc Paper Tape
For joint reinforcement.

Gyproc Fibre Tape
For joint reinforcement.

Insulation products

Isover Acoustic Partition Roll
25mm and 50mm for improved acoustic and thermal performance.

Stone mineral wool (by others)
For increased fire performance.

Eligible for the SpecSure warranty from Gyproc

System components (continued)

Gyptone board products

Gyptone QUATTRO 41

Thickness	12.5mm
Length	2400mm
Width	1200mm

Gyptone QUATTRO 42

Thickness	12.5mm
Length	2400mm
Width	1200mm

Gyptone QUATTRO 46

Thickness	12.5mm
Length	2400mm
Width	1200mm

Gyptone QUATTRO 47

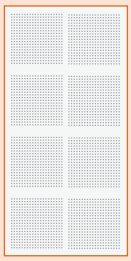
Thickness	12.5mm
Length	2400mm
Width	1200mm

Gyptone LINE 6

Thickness	12.5mm
Length	2400mm
Width	1200mm

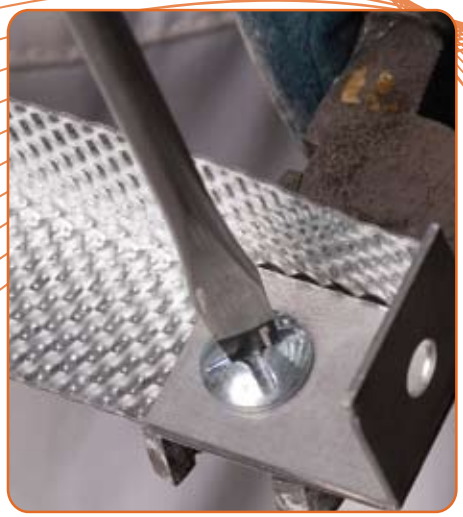
Gyptone LINE 7

Thickness	6.5mm
Length	2400mm
Width	900mm



Gyptone SIXTO 63

Thickness	12.5mm
Length	2400mm
Width	1200mm



Installation overview

Suspension from concrete soffit

Gypframe GA1 Perimeter Angle is fixed to the wall at maximum 600mm centres. Soffit cleats are secured to the soffit at 1200mm centres, using appropriate fixings, Gypframe GA1 Steel Angles are pre-cut and secured to the soffit cleats. Gypframe MF7 Primary Support Channels are installed over the Gypframe GA1 Perimeter Angles. Fix hangers (two per fixing) to Gypframe MF7 Primary Support Channel using Gyproc Wafer Head Jack-Point Screws. Gypframe MF5 Ceiling Sections are run at right angles to the underside of primary channels to form the secondary grid. The ceiling sections are secured to the primary channels by using two Gyproc Wafer Head Jack-Point Screws. Gyproc Boards are fixed to the secondary grid to form single or multi-layer linings as specified

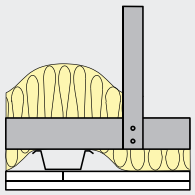
Board fixings

Board fixings for Gyproc boards should be at 150mm centres at board-ends, and at 230mm centres within the field of the board.

Board fixings for Gyptone boards should be at 230mm centres across board-ends and through the field of the board.

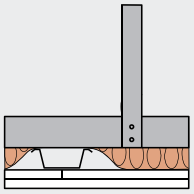
Table 1 – Gyproc MF fire protection to floor or roof cavity above suspended ceiling[1]. Solutions to satisfy the requirements of BS 476: Part 22: 1987

1



Gyproc MF suspended ceiling fixed to structure. Normal fixing centres for Gypframe MF5s and MF7s (450mm and 1200mm respectively). Insulation laid over Gypframe MF5 Ceiling Section. 100mm Isover APR1200 laid over Gypframe MF5 Ceiling Section.
Ceiling linings as in table.

2



Gyproc MF suspended ceiling fixed to structure. Normal fixing centres for Gypframe MF5s and MF7s (450mm and 1200mm respectively). 30mm stone mineral wool slab 45 kg/m^3 superscript laid over Gypframe MF5 Ceiling Section.
Ceiling linings as in table.

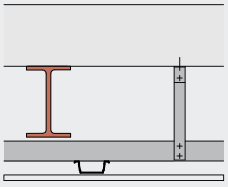
Detail	Board type	Ceiling Lining thickness mm	MF5 Support Centres mm	MF7 Support Centres mm	System reference
	30 minutes fire resistance BS				
1	Regular	2 x 12.5	450	1200	C106045
	60 minutes fire resistance BS				
2	FireStop	2 x 15	450	900	C106051

1 The requirement for providing cavity barriers in the same plane as fire resistant walls may not apply to cavities in floors and roofs if the ceiling beneath the floor or roof caviity provides a minimum of a full 30 minutes fire resistance (30 min integrity : 30 min insulation) in addition to satisfying other requirements.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

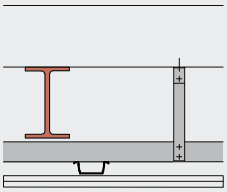
Table 2 – Gyproc MF fire protection to steel beams supporting concrete floors[1]. Solutions to satisfy the requirements of BS 476: Part 23: 1987

1



Gyproc MF ceiling suspended beneath steel beams supporting a concrete floor. Ceiling linings as in table.

2



Gyproc MF ceiling suspended beneath steel beams supporting a concrete floor. Ceiling linings as in table.

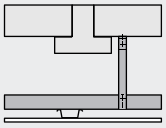
Detail	Board type	Ceiling Lining thickness mm	Approx. weight kg/m2	MF5 Support Centres mm	MF7 Support Centres mm	System reference
	30 minutes fire protection BS					
2	Regular	2 x 12.5	18	450	1200	C100013
	60 minutes fire protection BS					
1	FireStop	1 x 12.5	11	450	1200	C100014
	120 minutes fire protection BS					
2	FireStop	2 x 15	25	450	900	C100015

1 Concrete floors as described in BS 476: Part 23. The steel beams subjected to test had a section factor A/V (Hp/A) of 205m-1 calculated on the basis of three sided profiled exposure. The suspended ceiling will also provide adequate protection to steel beams with a lower section factor.

Sound insulation

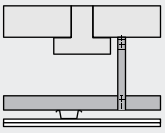
Table 3 – Gyproc MF upgrading the sound insulation of concrete floors

1



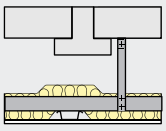
Gyproc MF ceiling suspended beneath basic floor to give 240mm cavity. Ceiling linings as in table.

2



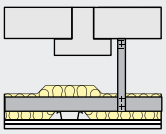
Gyproc MF ceiling suspended beneath basic floor to give 240mm cavity. Ceiling linings as in table.

3



Gyproc MF ceiling suspended beneath basic floor to give 240mm cavity, with 100mm Isover APR 1200 in cavity. Ceiling linings as in table.

4



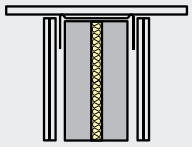
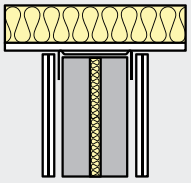
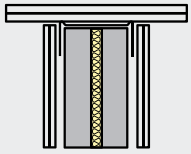
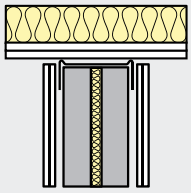
Gyproc MF ceiling suspended beneath basic floor to give 240mm cavity, with 100mm Isover APR 1200 in cavity. Ceiling linings as in table.

Detail	Board type	Ceiling Lining thickness mm	Approx. weight kg/m2	Sound insulation Airborne R_w dB	Sound insulation Impact L_{nw} dB	System reference
1	Regular	1 x 12.5	10	56	68	C100016
2	Regular	2 x 12.5	18	58	66	C100017
3	Regular	1 x 12.5	13	61	60	C100018
4	Regular	2 x 12.5	23	64	57	C100019

1 Basic floor construction is lightweight concrete joist floor with insulated concrete infill panel (surface density of infill is 90kg/m^2) and total depth 150mm. Sound insulation is Rw 35 dB (airborne) and Lnw 91 dB (impact).

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

Table 4 – Sound insulation of GypWall / Gyproc MF ceiling composite construction

1	2	3	4
			
Suspended ceiling construction	Suspended ceiling construction	Suspended ceiling construction	Suspended ceiling construction

Partition construction		Weighted standardised level difference (Dncw) and system reference			
		1 Single layer 12.5mm Gyproc Regular.	2 Single layer 12.5mm Gyproc Regular. 100mm Isover APR 1200 on back.	3 Double layer 12.5mm Gyproc Regular.	4 Double layer 12.5mm Gyproc Regular. 100mm Isover APR 1200 on back.
150mm Gypframe metal studs at 600mm centres. 25mm Isover APR 1200 in cavity. Two layers of 12.5mm Gyproc Regular each side.	**D_{ncw} dB** **System reference**	45 C10J008	48 C10J006	48 C10J007	49 C10J005
70mm Gypframe metal studs at 600mm centres. 25mm Isover APR 1200 in cavity. Two layers of 12.5mm Gyproc Regular each side.	**D_{ncw} dB** **System reference**	45 C10J012	45 C10J010	44 C10J011	45 C10J009

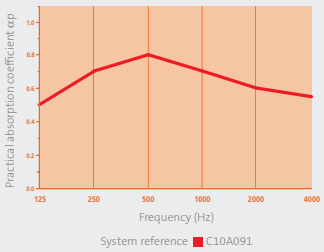
▶ Refer to Partitions and walls, **GypWall CLASSIC** system for partition performance data based on laboratory tests.

NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, according to Gyproc recommendations. The quoted performances are achieved only if Gyproc components are used throughout, and the company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with Gyproc.

Table 5 – Sound absorption data for Gyptone boards

Gyptone QUATTRO 41

Sound absorption coefficient αp



System reference C10A091

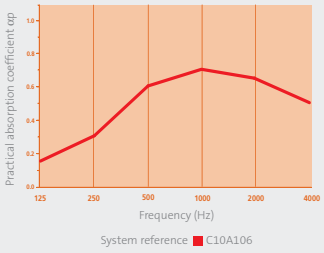
■ Gyptone **QUATTRO 41** at 400mm plenum

Practical absorption coefficient αp

125	250	500	1K	2K	4K	α_w	NRC
0.50	0.70	0.80	0.70	0.60	0.55	**0.65**	**0.70**

Gyptone QUATTRO 42

Sound absorption coefficient αp



System reference C10A106

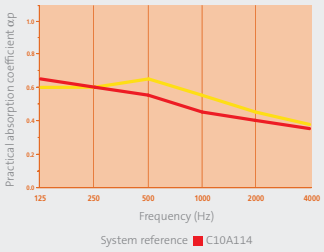
■ Gyptone **QUATTRO 42** at 400mm plenum

Practical absorption coefficient αp

125	250	500	1K	2K	4K	α_w	NRC
0.45	0.60	0.65	0.50	0.45	0.35	**0.40**	-

Gyptone QUATTRO 46

Sound absorption coefficient αp



System reference C10A114
C10A015

■ Gyptone **QUATTRO 46** at 400mm plenum

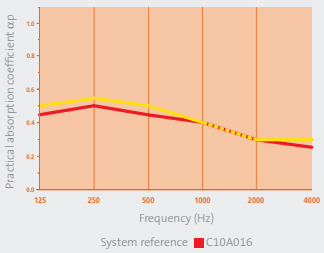
■ Gyptone **QUATTRO 46** plus 100mm Isover General Purpose Roll at 400mm plenum

Practical absorption coefficient αp

125	250	500	1K	2K	4K	α_w	NRC
0.65	0.60	0.55	0.45	0.40	0.35	**0.45**	**0.50**
0.60	0.60	0.65	0.55	0.45	0.40	**0.50**	**0.55**

Gyptone QUATTRO 47

Sound absorption coefficient αp



System reference C10A016
C10A017

■ Gyptone **QUATTRO 47** at 400mm plenum

■ Gyptone **QUATTRO 47** plus 50mm Isover APR at 400mm plenum

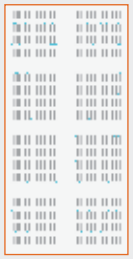
Practical absorption coefficient αp

125	250	500	1K	2K	4K	α_w	NRC
0.45	0.50	0.45	0.40	0.30	0.25	**0.35**	**0.40**
0.50	0.55	0.50	0.40	0.30	0.30	**0.40**	**0.45**

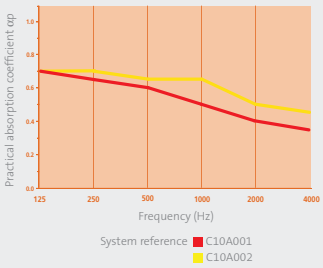
NB All products have been tested to BS EN 20354 and ISO 354. The single figure rating practical sound absorption coefficient αw is calculated in accordance with EN ISO 11654.

Table 5 (continued) – Sound absorption data for Gyptone boards

Gyptone LINE 6



Sound absorption coefficient αp

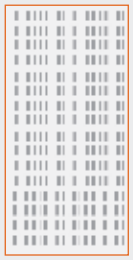


- Gyptone LINE 6 at 400mm plenum
- Gyptone LINE 6 plus 100mm Isover General Purpose Roll at 400mm plenum

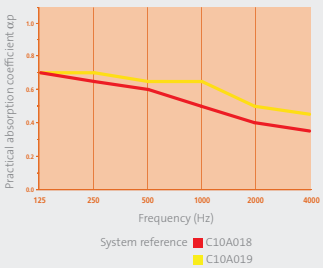
Practical absorption coefficient αp

125	250	500	1K	2K	4K	α_w	NRC
0.70	0.65	0.60	0.50	0.40	0.35	**0.45**	**0.55**
0.70	0.70	0.65	0.65	0.50	0.45	**0.55**	**0.65**

Gyptone LINE 7



Sound absorption coefficient αp

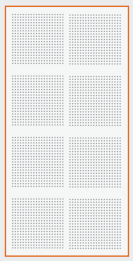


- Gyptone LINE 7 at 400mm plenum
- Gyptone QUATTRO 46 plus 100mm Isover General Purpose Roll at 400mm plenum

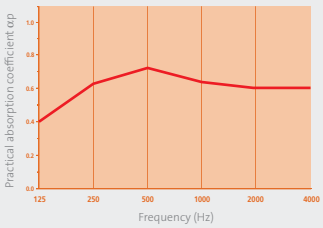
Practical absorption coefficient αp

125	250	500	1K	2K	4K	α_w	NRC
0.70	0.65	0.60	0.50	0.40	0.35	**0.45**	**0.55**
0.70	0.70	0.65	0.65	0.50	0.45	**0.55**	**0.65**

Gyptone SIXTO 63



Sound absorption coefficient αp



- Gyptone SIXTO 63 at 200mm plenum

Practical absorption coefficient αp

125	250	500	1K	2K	4K	α_w	NRC
0.35	0.60	0.70	0.60	0.55	0.55	**0.60**	**0.60**

NB All products have been tested to BS EN 20354 and ISO 354. The single figure rating practical sound absorption coefficient αw is calculated in accordance with EN ISO 11654.

Design

Cavity barriers
Where cavity barriers are required, these can be formed using Gyproc FireStop screw-fixed to a simple metal or timber frame. The framing should be fixed to the structure to avoid undue loading of the ceiling suspension grid or, alternatively, additional hangers should be incorporated to support the ceiling alongside the cavity barrier

Relative humidity
Gyproc MF ceilings lined with Gyproc or Gyptone boards are suitable for use under normal occupancy conditions. Buildings in which they are used should be dry, glazed and enclosed, with environmental conditions of no greater than 70% RH at 10°C to 20°C. For high humidity / high moisture conditions use Gyproc moisture resistant **(MR)** plasterboard variants.

Acoustic performance
Gyptone boards are perforated and designed to provide sound absorption when used in conjunction with an airspace behind the ceiling. Increased levels of sound absorption can be achieved by including insulation over the back of the ceiling. Where sound insulation room-to-room is required, sound attenuation (D_{ncw}) of 39dB can be achieved by the inclusion of 100mm Isover APR over the back of the ceiling. Alternatively, other design considerations should be adopted such as extending adjoining partitions into the plenum void or installing a plenum barrier.

Thermal performance
Isover insulation can be laid over the suspension grid to provide the required standard of thermal insulation. Contact Gyproc Technical Support for further guidance.

Suspension - Gyproc and Gyptone board linings
Fixing points for suspending the metal grid are required at 1200mm centres in each direction. Suitable fixing devices should be employed when fixing to the structure.

The ceiling grid can be suspended from a concrete soffit using soffit cleats and Gypframe GA1 Steel Angle to provide a robust suspension support, which restricts any flexing of the lining when pressure is applied from below.

If fixing Gypframe GA1 Steel Angle direct to the soffit, the angle is cut and bent to fit. For single layer boarding, where Gypframe GA1 Steel Angle is fixed direct, the Gypframe MF7 Primary Support Channel and Gypframe GA1 Steel Angles are fixed at 1200mm centres. For double layer ceilings the Gypframe GA1 Steel Angles are fixed at maximum 1200mm centres, but the Gypframe MF7 Primary Support Channels are closed down to 900mm maximum centres. This will reduce the maximum loads that the grid is capable of supporting by 25%. Furthermore, fixing Gypframe GA1 Steel Angles direct is not suitable if the ceiling is likely to deflect due to varying pressures.

Partition to suspended ceiling junction
In situations where a **GypWall** metal stud partition passes through a **Gyproc MF** ceiling, which is to both sides of the partition and appropriately fixed to both this partition and perimeter partitions / walls, consideration can be given to the lateral restraint provided by the ceiling when developing the partition specification.

The relevant maximum height is the greater of the floor to **Gyproc MF** ceiling or ceiling to structural soffit height. Care should be taken during installation of tall partitions so as to not adversely affect their performance. Contact Gyproc Technical Support for further guidance.

Where a **GypWall** metal stud partition is fixed to the framework of a **Gyproc MF** ceiling, in accordance with Gyproc's installation instructions, the permissible maximum height is equal to that of where it is fixed direct to a structural soffit of the same height.

Imposed loads
Tables 6 and 7 provide loading data for the suspension grid for Gyproc and Gyptone boards respectively. Maximum loads will be reduced by 25% when Gypframe GA1 Steel Angle is fixed directly to the soffit (modified loads are shown in brackets).

Table 6 – Maximum recommended loads on Gyproc MF with Gyproc board linings

Maximum load including weight of board and any insulation MF5[1] at 450mm centres kg/m² (modified load)	Suspension point centres mm	MF7[2] channel centres mm
35 (26)	1200	600
35 (26)	1200	900
25 (19)	1200	1200

1 Gypframe MF5 Ceiling Section.
2 Gypframe MF7 Primary Support Channel.

Table 7 – Maximum recommended loads on Gyproc MF with Gyptone board linings

Maximum load including weight of board and any insulation MF5[1] at 600mm centres kg/m² (modified load)	Suspension point centres mm	MF7[2] channel centres mm
30 (23)	1200	600
18 (14)	1200	900
14 (11)	1200	1200

1 Gypframe MF5 Ceiling Section.
2 Gypframe MF7 Primary Support Channel.

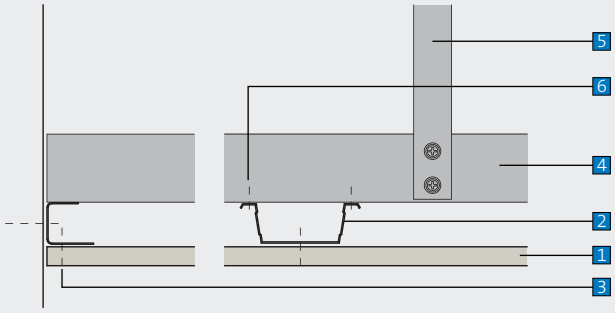
Services
The plenum can be used to route all service requirements including ducting, pipework, electrical cables and conduit. Where light fittings, access panels and similar components are incorporated as part of the design requirements, consideration must be given to maintaining the integrity of the ceiling to meet fire resistance and sound insulation requirements.

Fixtures
Fixings to the system should always be made into the metal grid or to supplementary framing. Some adjustment of the primary grid may be required to support particularly heavy loads, see Tables 6 and 7. Where loads outside this range are anticipated, independent suspension should be provided from the structure.

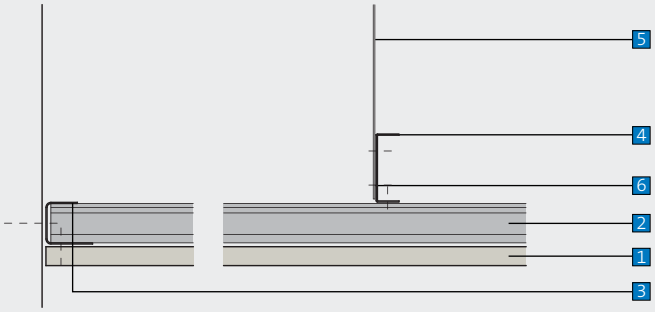
Control joints
Control joints may be required in the ceiling to relieve stresses induced by expansion and contraction of the structure. It is recommended that they coincide with movement joints within the surrounding structure.

Construction details

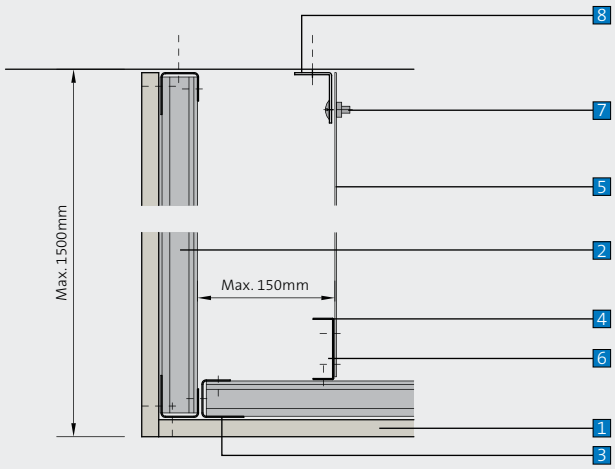
1 Perimeter parallel to Gypframe MF5 Ceiling Section 2 - screw-fixed



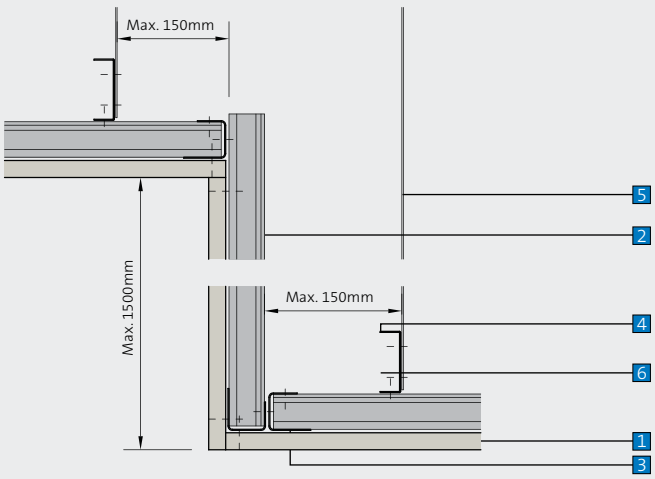
Perimeter perpendicular to Gypframe MF5 Ceiling Section - screw-fixed 2



3 Bulkhead - screw-fixed



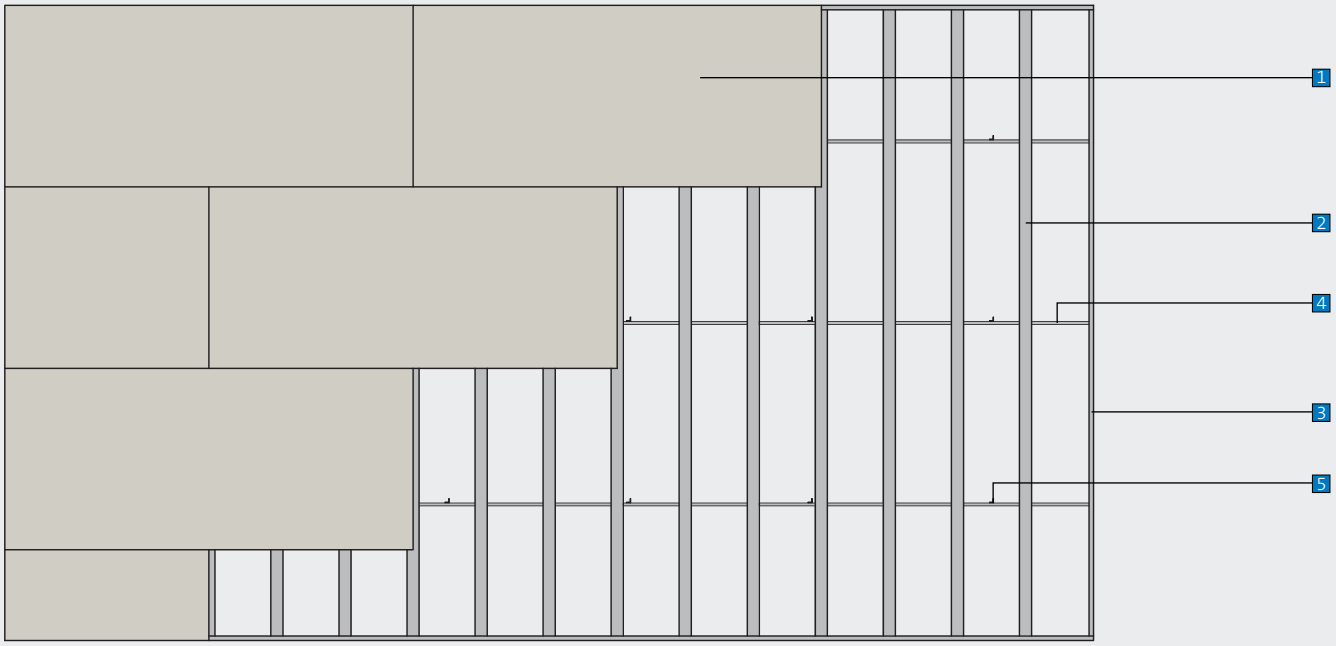
Change of level - screw-fixed 4



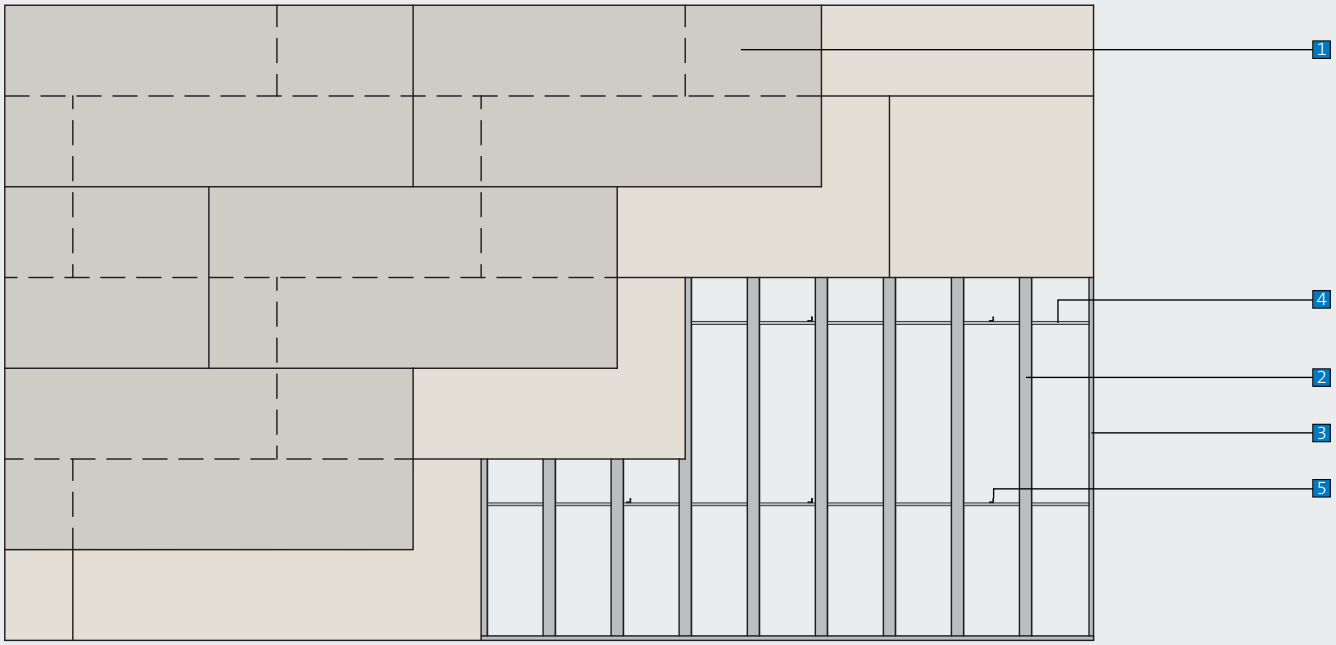
1 Gyproc plasterboard
2 Gypframe MF5 Ceiling Section
3 Gypframe MF6 Perimeter Channel
4 Gypframe MF7 Primary Support Channel
5 Gypframe GA1 Steel Angle
6 Gyproc Wafer Head Jack-Point Screw
7 Nut and Bolt by others
8 Soffit Cleat by others

Construction details

5 Reflected ceiling plan - single layer



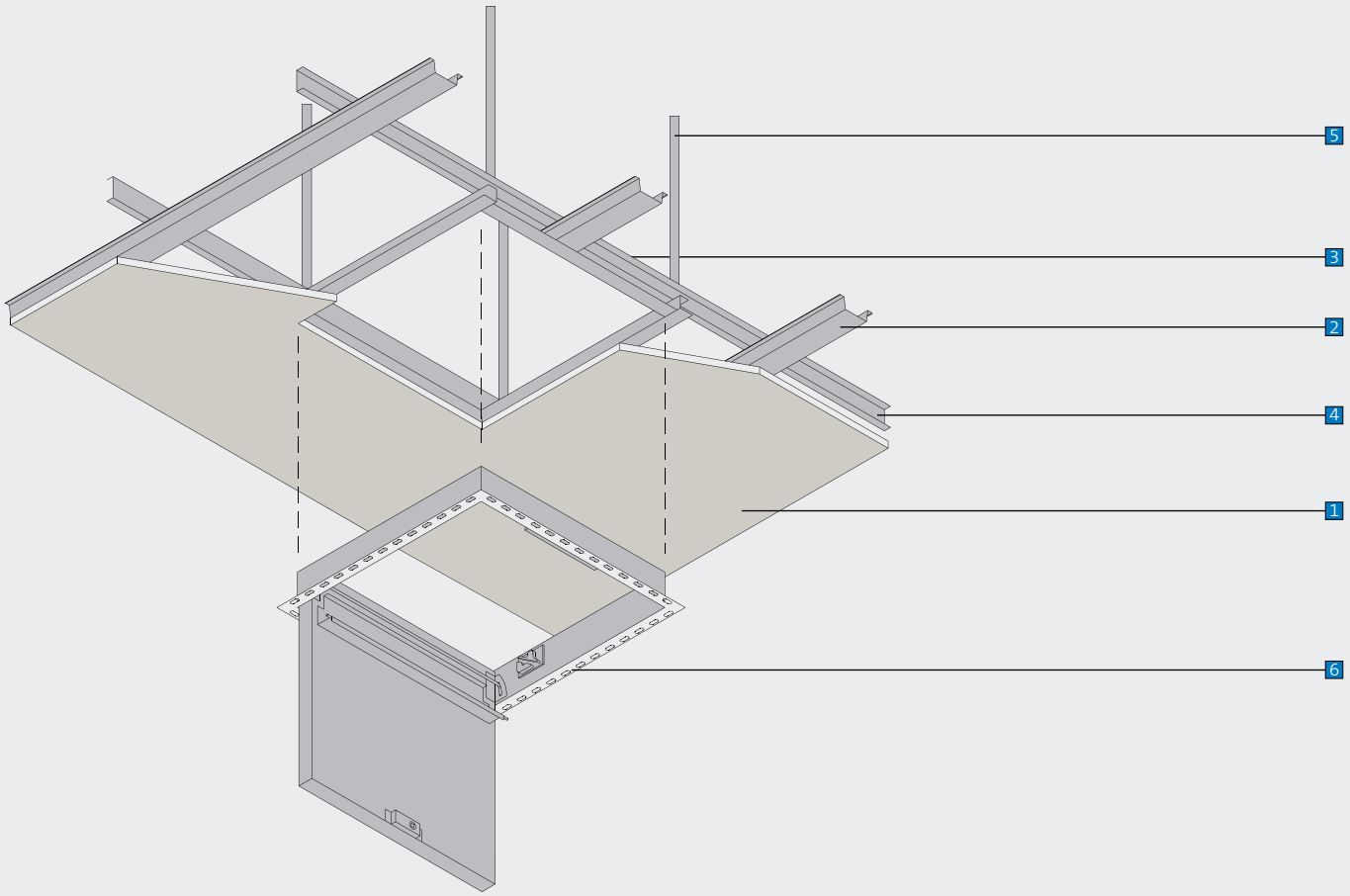
6 Reflected ceiling plan - double layer



1 Gyproc plasterboard
2 Gypframe MF5 Ceiling Section
3 Gypframe GA1 Perimeter Angle
4 Gypframe MF7 Primary Support Channel
5 Gypframe GA1 Steel Angle

Construction details

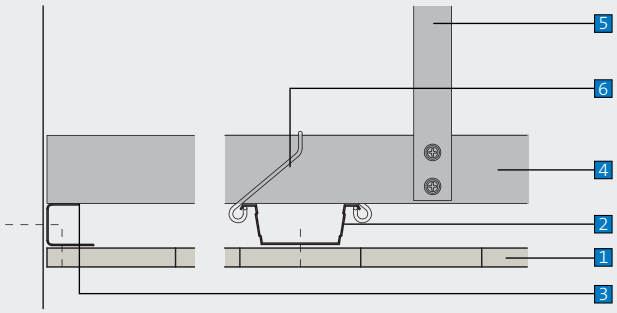
7 Gyproc access panel installation



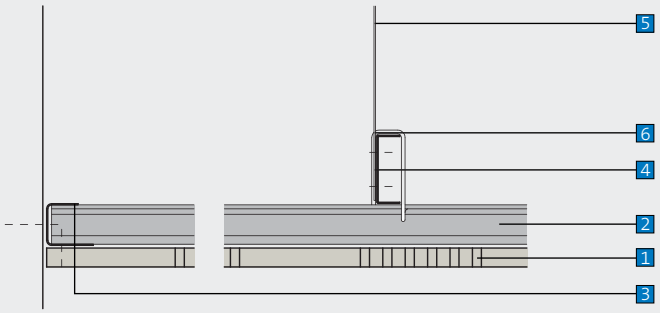
1 Gyproc plasterboard
2 Gypframe MF5 Ceiling Section
3 Gypframe GA1 Perimeter Angle
4 Gypframe MF7 Primary Support Channel
5 Gypframe GA1 Steel Angle
6 Gyproc Access Panel

Construction details

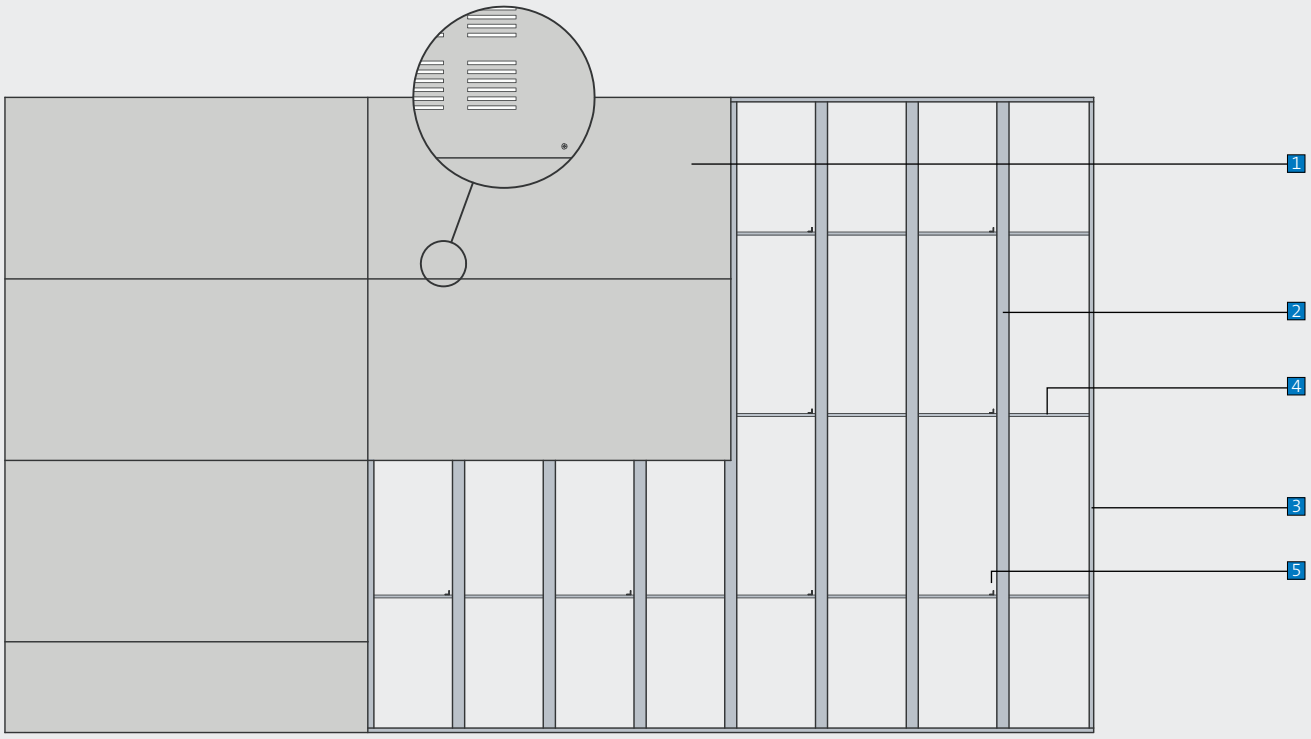
8 Perimeter parallel to Gypframe MF5 Ceiling Section - Gyptone



Perimeter perpendicular to Gypframe MF5 Ceiling Section - Gyptone 9



10 Reflected ceiling plan - Gyptone

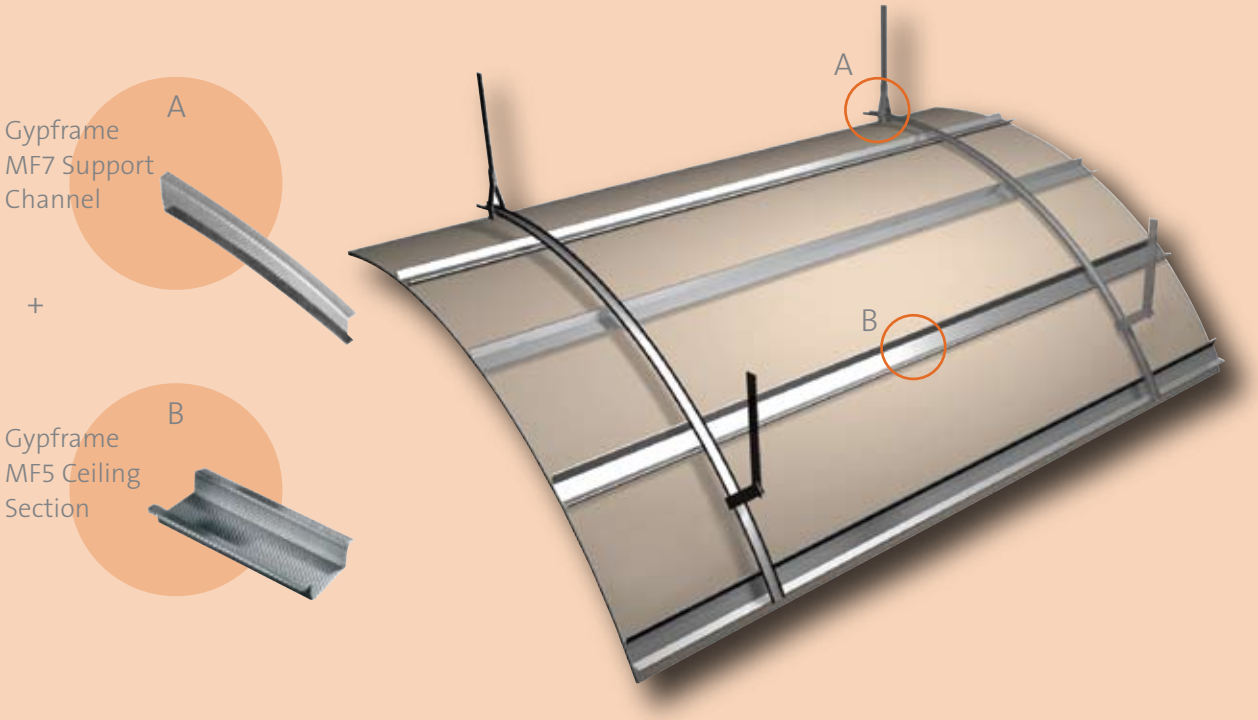


1 Gyptone boards
2 Gypframe MF5 Ceiling Section
3 Gypframe GA1 Perimeter Angle
4 Gypframe MF7 Primary Support Channel
5 Gypframe GA1 Steel Angle

Gyproc MF CURVE

Concealed grid MF curved ceiling system

Gyproc MF CURVE is a lightweight, non-loadbearing, suspended ceiling system for constructing curved ceilings and soffit linings. It can be used in conjunction with Gyproc perforated and non-perforated boards to create convex or concave ceilings to achieve the required radius. The linings are simple to install and provide non fire-rated solutions for all types of buildings.



Key facts

- Can be used on concave or convex structures
- Minimum radius 600mm
- Uses pre-formed curved support channel
- No board pre-wetting required
- Normal jointing techniques apply
- Can be used with all Gyproc and Gyptone boards

Applications

A wide range of applications, for example receptions and communal areas.

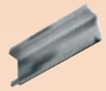
Sector

- ✓ Office / commercial
- ✓ Retail
- ✓ Sport and leisure
- ✓ Education
- ✓ Healthcare
- ✓ Apartment buildings
- ✓ High-rise multi-occupancy
- ✓ Auditoria

Gyproc MF CURVE

System components

Gypgrame metal products



MF5 Ceiling Section
Main support section.
Length 3000mm

GA1 Angle
Perimeter support for Gypframe MF5 Ceiling Section and for suspension of ceiling grid.
Length 3000mm

MF7 Support Channel
Primary support for Gypframe MF5 Ceiling Section.
Length 3000mm

Board products

Gyproc Regular
Thickness 9, 12.5, 15mm
Width 1200mm

Gyproc FireStop
Thickness 12.5, 15mm
Width 1200mm

Glasroc F MULTIBOARD
Thickness 6mm
Width 1200mm

Fixing and finishing products

Gyproc Wafer Head Drywall Screws
For Gypframe metal-to-metal fixing less than 0.8mm thick.

Gyproc Wafer Head Jack-Point Screws
For fixing hanger to Gypframe MF7 Primary Support Channel, and for fixing Gypframe MF5 Ceiling Section to Gypframe MF7 Primary Support Channel.

Gyproc Drywall Screws
For fixing boards to Gypframe metal framing less than 0.8mm thick.

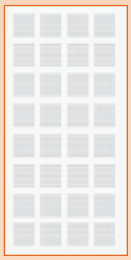
Gyproc Jointing Compound
For seamless jointing.

Gyproc Paper Tape
For joint reinforcement.

Gyproc Fibre Tape
For joint reinforcement.

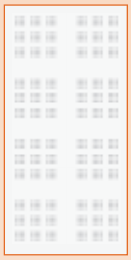
Gyptone board products

Gyptone QUATTRO 41
Thickness 12.5mm
Length 2400mm
Width 1200mm

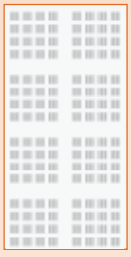


Gyptone QUATTRO 42
Thickness 12.5mm
Length 2400mm
Width 1200mm

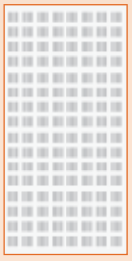
Gyptone QUATTRO 46
Thickness 12.5mm
Length 2400mm
Width 1200mm



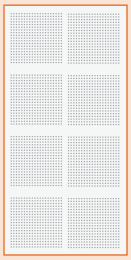
Gyptone QUATTRO 47
Thickness 12.5mm
Length 2400mm
Width 1200mm



Gyptone LINE 6
Thickness 12.5mm
Length 2400mm
Width 1200mm



Gyptone LINE 7
Thickness 6.5mm
Length 2400mm
Width 900mm



Gyptone SIXTO 63
Thickness 12.5mm
Length 2400mm
Width 1200mm

Eligible for the SpecSure warranty from Gyproc

Installation overview

Suspension from concrete soffit
Gypframe GA1 Angle is fixed at wall positions to the line of the curve. Timber fillets are installed where required to pack out the channel. Soffit cleats (from others) are secured to the soffit using appropriate fixings. Gypframe GA1 Steel Angle hangers are pre-cut and secured to the soffit cleats. Gypframe MF7 primary support channel -rolled to the required radius at site is installed over the Perimeter angle and secured to the hangers. Gypframe MF5 Ceiling Sections are run at right angles to the underside of the rolled support channel to form the secondary grid. The ceiling sections are secured to the primary channels by screw-fixing. Boards are fixed to the secondary grid to form single or double layer linings to the curvature of the grid.

The procedure for installing Gyptone LINE 7 CURVE differs from other board options, and additional care is required at the jointing stage to avoid filling perforations with jointing material.

Refer to floor, ceiling and soffit systems, Gyproc MF for additional information.

Design

Planning - key factors

Gypframe MF7 Support Channel is to be rolled at site to the radius required. Board joints should be avoided on the apex of the curve for the exposed layer of board. Gypframe MF5 Ceiling Section positions should therefore be pre-determined at the design stage.

Degree of curvature

In common with other sheet materials, board-ends have a tendency to remain straight, and so the minimum achievable radius will be influenced by the board characteristics, the length of curve, the support centres, and the occurrence of board joints. See Table 1.

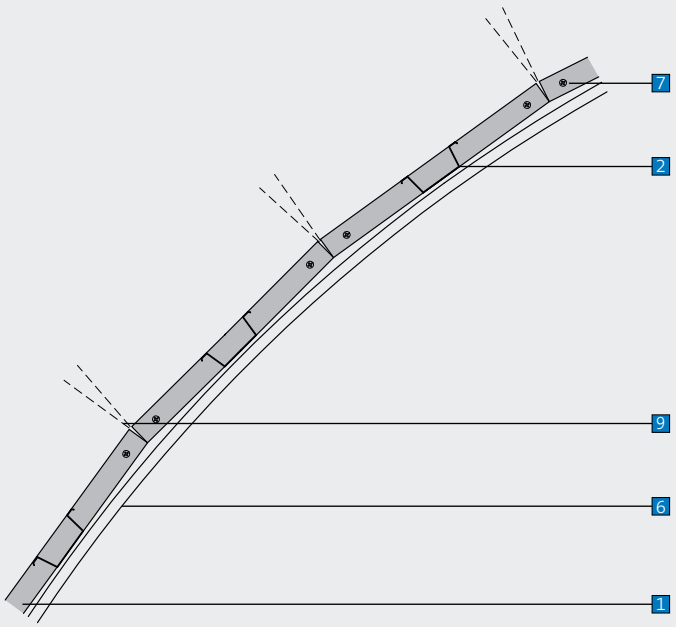
Table 1 - Minimum radii and framing centres

Board type	Thickness	Minimum redius[1]	MF5[3] centres	Span (suspension points) of MF7[4]	MF7[4] centres
	mm	mm	mm	mm	mm
Glasroc F MULTIBOARD	6	600	300	900	1200
Gyptone QUATTRO 41	12.5	6000	300	900	1200
Gyptone QUATTRO 45	12.5	6000	300	900	1200
Gyptone QUATTRO 46	12.5	6000	300	900	1200
Gyptone QUATTRO 47	12.5	6000	300	900	1200
Gyptone LINE 6	12.5	6000	300	900	1200
Gyptone LINE 7 Curve	6.5	1200	300	900	1200
Gyptone BASE Curve[2]	6.5	1200	300	900	1200
Gyproc Regular	9	1800	300	750	1200
	12.5	3600	300	600	1200
	15	4800	300	600	1200
Gyproc FireStop	12.5	4800	300	600	1200
	15	5700	300	600	1200

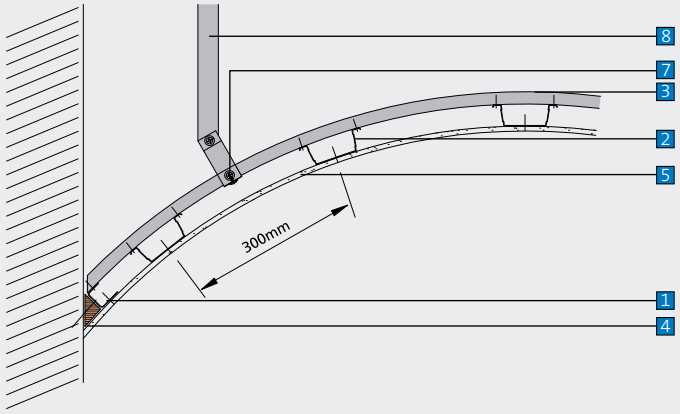
1 Concave or convex.
2 Gyptone BASE Curve board is used in conjuction with Gyptone LINE 7 CURVE to create non-perforated areas, e.g. around perimeters.
3 Gypframe MF5 Ceiling Section.
4 Gypframe MF7 Primary Support Channel - rolled to the required radius at site.

Construction details

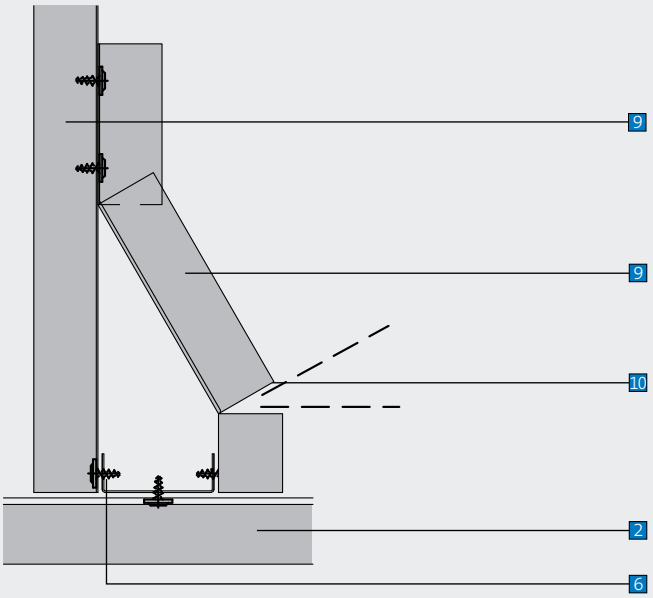
1 Gypframe GA1 angle cut and fixed to line of curve at perimeter



Wall junction 2

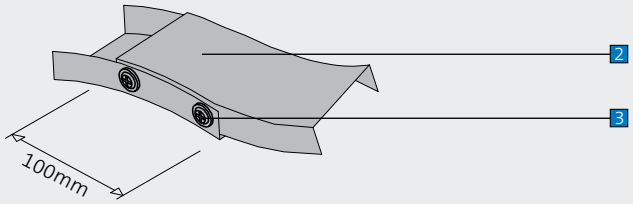


3 Hanger - Gypframe MF7 Primary Support Channel (rolled to the required radius at site) connection using Gypframe GA1 Steel Angle



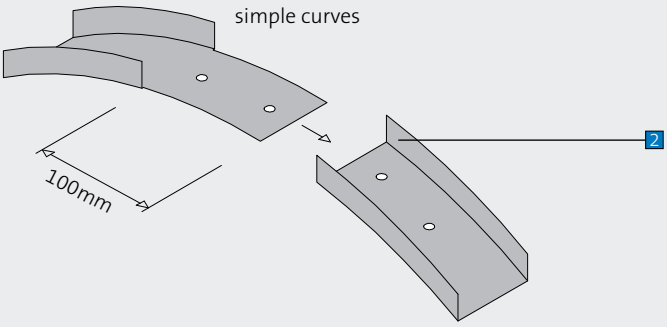
1 Gypframe GA1 Steel Angle
2 Gypframe MF5 Ceiling Section
3 Gypframe MF7 Support Channel - rolled to the required radius at site
4 Timber fillet
5 Lining board
6 Gyproc Wafer Head Jack-Point Screw
7 Fixing to structure
8 Gypframe GA1 Steel Angle hanger
9 Gypframe GA1 Steel Angle cut and bent to required curve
10 Gypframe GA1 Steel Angle, cut and bent

5 Methods of joining Gypframe MF7 Support Channels

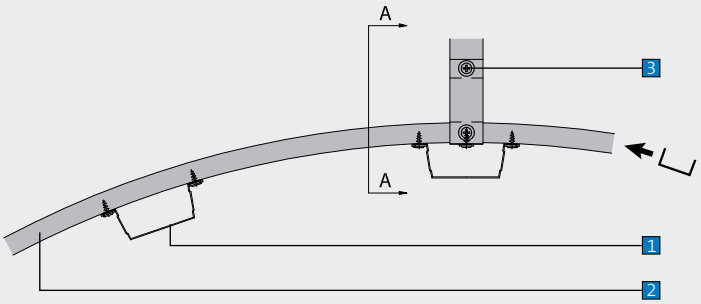


Method: where curvature changes from convex to concave additional hanger is required.

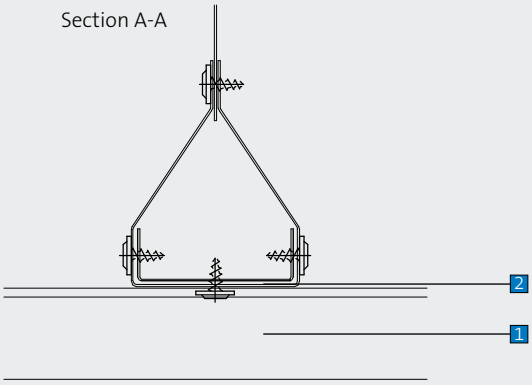
Standard method for simple curves



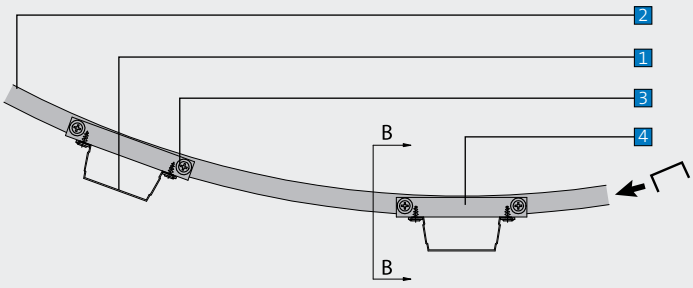
6 Concave curvature



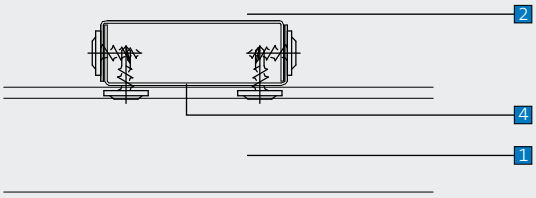
Section A-A



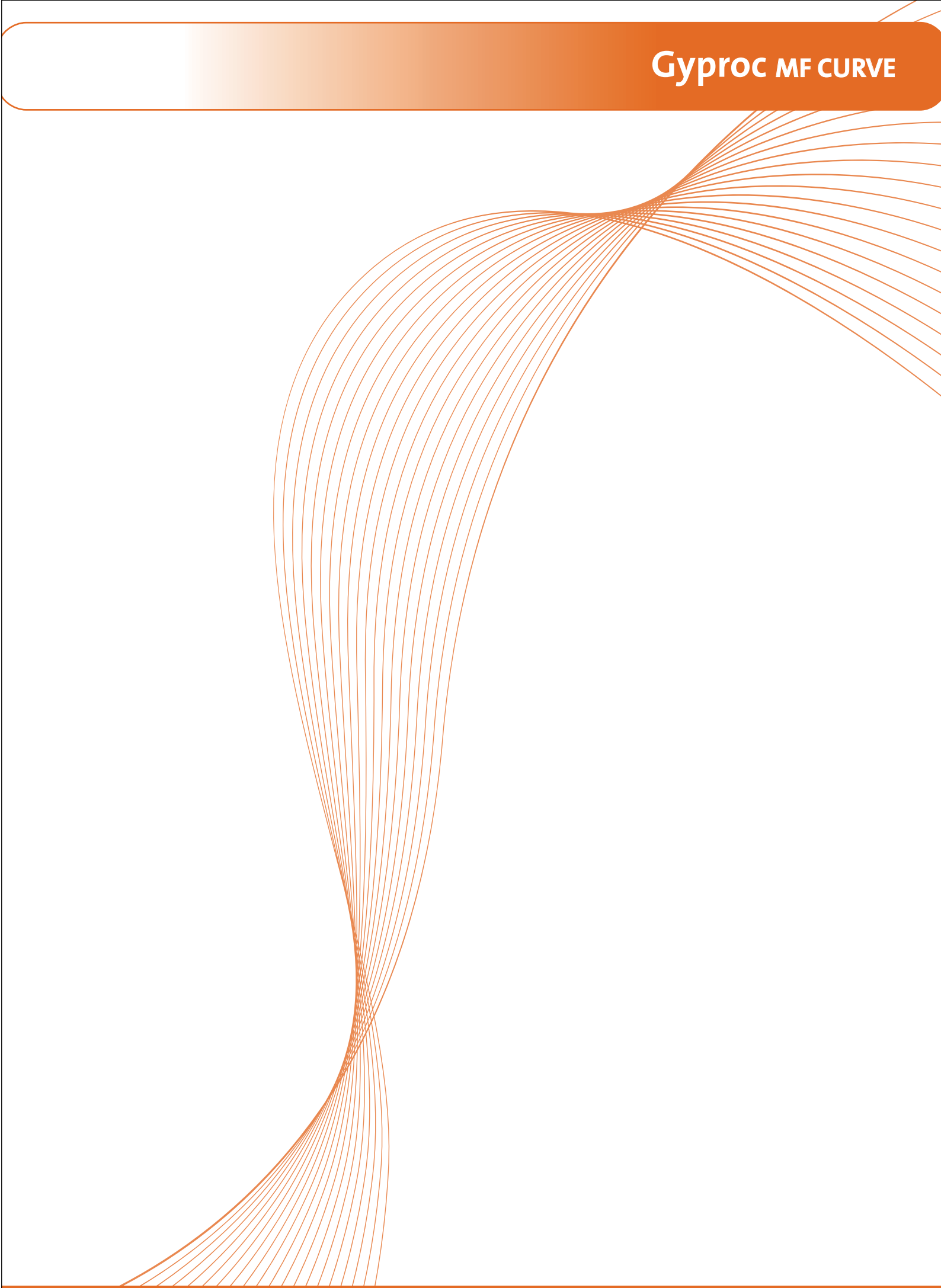
7 Convex curvature



Section B-B

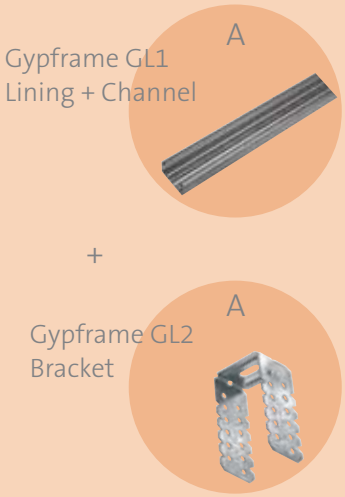


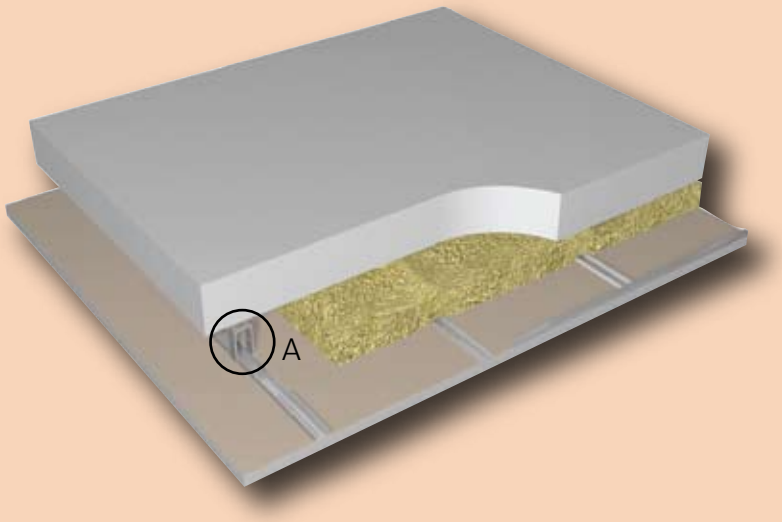
1 Gypframe MF5 Ceiling Section
2 Gypframe MF7 Curved Support Channel - rolled to the required radius at site
3 Gyproc Wafer Head Jack-Point Screw
4 Small section of Gypframe MF7 Primary Support Channel fixed to bridge the Gypframe MF7 Curved Support Channel flanges to provide a flat, positive fixing for the Gypframe MF5 Ceiling Section positions




GROSVENOR HOUSE

GypLyner UNIVERSAL CEILING is a general purpose ceiling lining system suitable for most internal applications. It is used in all types of buildings from residential properties to large commercial developments, and is equally suited to both new-build and refurbishment.





Key facts

- General purpose ceiling lining
- Suitable for concrete soffits all
- Stand-off can be adjusted from 25mm to 75mm
- Same components as ceiling and wall linings
- Ceiling void accommodates small service routings

Applications

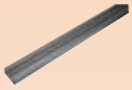
Due to the design flexibility of GypLyner UNIVERSAL, this system can be tailored to meet the requirements of a wide range of applications.

Sector

- ✓ Office / commercial
- ✓ Retail
- ✓ Sport and leisure
- ✓ Education
- ✓ Healthcare
- ✓ Auditoria
- ✓ Apartment buildings
- ✓ High-rise multi-occupancy

System components

Gypgrame metal products



GL1 Lining Channel — **Length** 3000mm

GL2 Bracket
Maximum 75mm drop — **Length** 190mm

GA1 Angle — **Length** 3000mm

Board products

Gyproc Regular
Thickness 12.5, 15mm
Width 1200mm

Gyproc Moisture Resistant
Thickness 12.5, 15mm
Width 1200mm

Gyproc FireStop[1]
Thickness 12.5, 15mm
Width 1200mm

1 Moisture resistant (MR) version of the above boards is specified in intermittent wet use areas, e.g. shower cubicles.

Fixing and finishing products

Gyproc Wafer Head Drywall Screws
For Gypframe metal-to-metal fixing less than 0.8mm thick.

Gyproc Drywall Screws
For fixing boards to Gypframe metal framing less than 0.8mm thick.

Gyproc Jointing Compound
For seamless jointing.

Gyproc Paper Tape
For joint reinforcement.

Gyproc Fibre Tape
For joint reinforcement.

Insulation products

Isover Acoustic Partition Roll
25mm and 50mm for improved acoustic and thermal performance.

Eligible for the SpecSure warranty from Gyproc

Installation overview - Fixing to a concrete soffit

Gypframe GA1 Angle is fixed around the perimeter. Gypframe GL2 Brackets are fixed at the required centres. Gypframe GL1 Lining Channel is located at the correct centres and each leg of the Gypframe GL2, Bracket is screw-fixed to the Gypframe GL1 Lining Channel. The protruding legs of each bracket are bent to sit back from the channel face.

Additional angle or supplementary framing is installed if required to support fixtures. Boards are fixed to the Gypframe GL1 Lining Channels to form one or two layer linings as specified.

Design

Planning - key factors
The depth of the ceiling cavity is determined by the positioning of the fixing brackets. For concrete soffits the fixing brackets allow sufficient adjustment for levelling the ceiling. When using Gypframe GL2 Brackets, allow for a stand-off of 25mm – 75mm plus the lining thickness.

Cavity barriers
Where cavity barriers are required these can be formed using Gyproc FireStop or Glasroc F MULTIBOARD screw-fixed to a simple metal frame. The framing should be fixed to the structure to avoid undue loading of the ceiling suspension system.

Fixing to the structure
When lining concrete soffits, fixing brackets should be positioned equidistant at up to 1200mm maximum centres.

Services
The cavity above the metal framework facilitates the incorporation of services. Pipes and conduits should be fixed in position before installing the framing. Where light fittings, access panels and similar components are incorporated as part of the design requirements, consideration must be given to maintaining the integrity of the ceiling to meet fire resistance and sound insulation requirements.

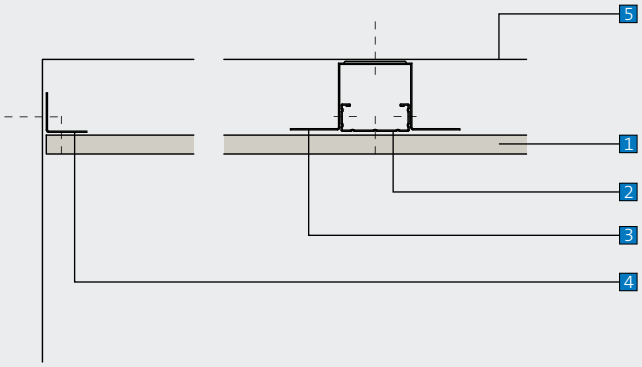
Refer to Service installations.

Fixtures
Fixtures with a maximum weight of 3kg, e.g. single lights, can be fixed into the channels. For other fixtures, independent suspension should be provided from the structure.

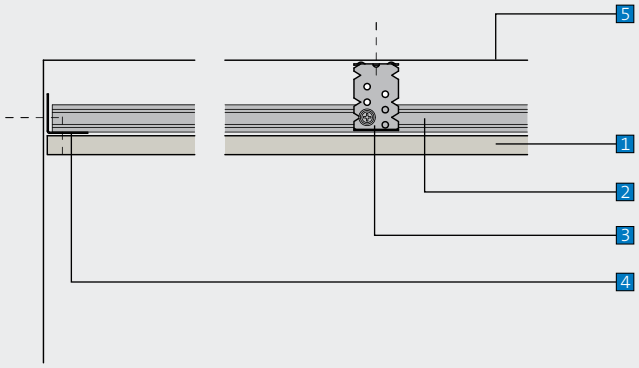
Board finishing
Refer to Finishing systems.

Construction details

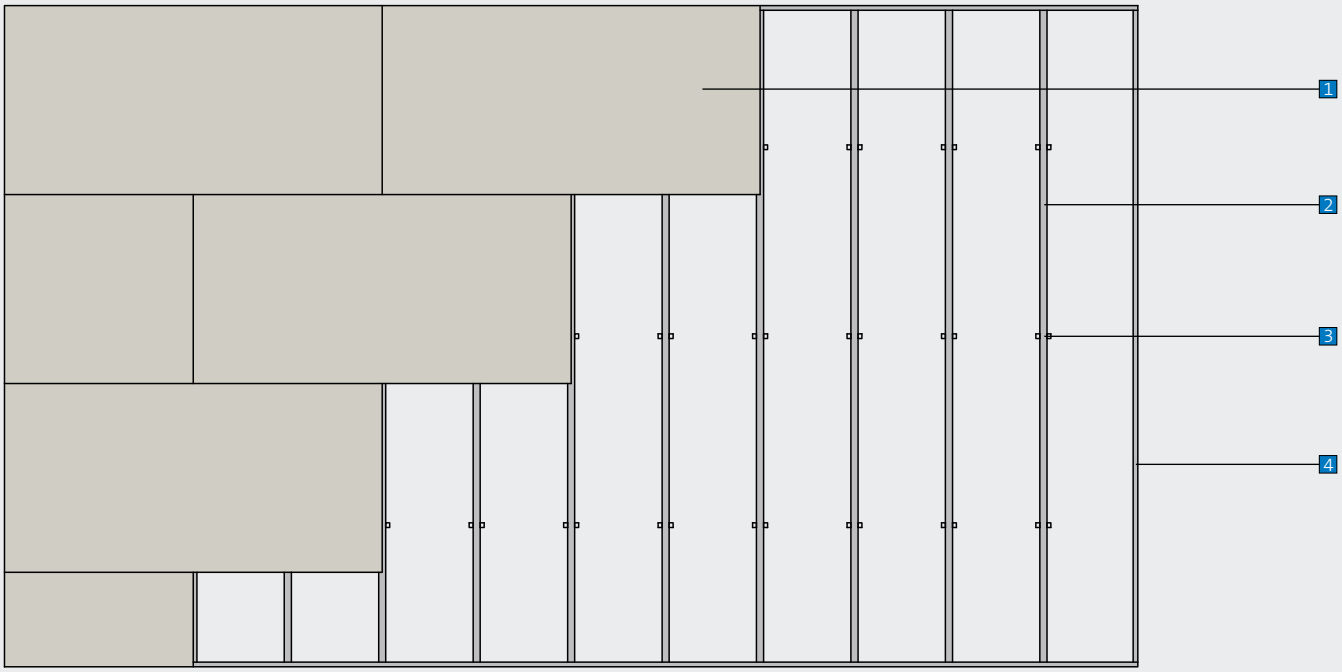
1 Perimeter parallel to Gypframe GL1 Lining Channel for concrete soffit



Perimeter perpendicular to Gypframe GL1 Lining Channel for concrete soffit 2



3 Reflected ceiling plan for concrete soffit - single layer 15mm Gyproc plasterboard with channels at 600mm maximum centres (or 12.5mm Gyproc plasterboard with channels at 450mm maximum centres)



1 Gyproc plasterboard
2 Gypframe GL1 Lining Channel
3 Gypframe GL2 Bracket
4 Gypframe GA1 Angle
5 Concrete soffit

Gyproc Jointing Compound and accessories produce durable joint reinforcement and a smooth, continuous, crack-resistant surface ready for priming and final decoration. They also seal the lining, a prerequisite if the building element is to achieve specified levels of fire resistance and sound insulation. The materials are normally applied manually using hand tools and a number of jointing specifications are available to suit the board type, method of application, and site preference. The jointing process normally involves three application stages; bedding the tape and bulk filling the joint, secondary filling to take up shrinkage, and finishing.

Key facts

- Produces a seamless surface ready for decoration
- Choice of jointing materials to suit user preference
- Ready-mixed for ease of application

Applications

Due to the design flexibility of Gyproc systems, they can be tailored to meet the requirements of a wide range of applications.

Sector

- ✓ Office / commercial
- ✓ Retail
- ✓ Sport and leisure
- ✓ Education
- ✓ Healthcare
- ✓ Industrial
- ✓ Custodial
- ✓ Housing
- ✓ Apartment buildings
- ✓ High-rise multi-occupancy
- ✓ Auditoria

Jointing

System components

Fixing and finishing products

Gyproc Paper Tape
Paper tape for flat and internal angle joints. Incorporates a centre crease, chamfered edges and spark perforations. Available in a 150m roll.

Gyproc Fibre Tape
Self adhesive glass fibre mesh tape for reinforcing plasterboard joints and angles. Available in a 90m roll.

Gyproc Jointing Compound
Air drying, ready mixed jointing material used for all stages of the jointing process. Available in 28kg pails.

Installation overview

Preparation - general
Board finishing should be completed as soon as possible after the boards have been fixed. Board surfaces should be reasonably dry, clean and protected from the weather. Boards should be securely fixed with no steps between adjacent boards. The correct fixings must be used and properly located with their heads just below the liner surface. Any protruding screw heads should be driven home with a hand screwdriver prior to jointing. Gaps between boards greater than 3mm should be pre-filled using Gyproc Jointing Compound.

Hand jointing - Gyproc plasterboards
Gyproc Paper Tape is bedded into the Gyproc Jointing Compound. See Table 1.

If Gyproc Fibre Tape is used, bedding is not required, but the joint compound should be pressed through the holes in the tape, particularly if there is a gap between board joints. This is important to achieve a satisfactory appearance to the finished joint.

Two or three applications of jointing compound are trowel applied, each feathered out beyond the previous application. An equal number of applications are made to spot screw heads. The joint treatment is sanded as necessary to achieve a smooth surface. At internal angles, Gyproc Paper Tape is creased to the angle to provide reinforcement and bedded using a knife or trowel. At external angles, where additional protection is required, an angle bead can be applied. An edge bead is normally used to protect cut ends of boards, e.g. at reveals.

Eligible for the SpecSure warranty from Gyproc

Jointing - Gyptone boards
Gyproc Paper Tape is bedded in Gyproc Jointing Compound to all four tapered edges and bulk-filled. When set, a finish coat of Gyproc Jointing Compound is applied to all joints.

Care must be taken not to fill the perforations in the board and thereby impair the sound absorption performance.

The joint treatment is lightly sanded and dusted off. A drywall primer can then be applied by roller to the entire surface ready for decoration.

Cleaning equipment
All equipment should be thoroughly cleaned after use. Small residual amounts of set or part-set material will accelerate the set of freshly mixed setting jointing compounds, and residues of compounds left in a wet state will be subject to microbial attack.

Decoration
Painting
After the jointing treatment has set and dried, and any final sanding is complete, the surface should be dusted down. A drywall primer applied by brush, roller or, except for Gyptone or Rigitone perforated boards, suitable spray equipment. The primer evens out differences in surface texture and absorption between the board and jointed areas, to create the ideal surface to receive final decoration. Its early application helps to prevent plasterboards from yellowing.

As with all wall and ceiling areas, high sheen gloss finishes will highlight variations of the surface, particularly with shallow angle lighting. The use of low sheen or matt finishes minimises this risk.

For the correct specification in respect of any applied decorative material, reference should be made to the manufacturer of that material.

Design

Preparation - key stages
1. Boards should be securely fixed, with no steps between adjacent boards.

2. The correct fixings must be used and properly located with their heads just below the liner surface. Any protruding screw heads should be driven home using a hand screwdriver, prior to spotting and jointing.

3. Gaps between boards greater than 3mm should be pre-filled, prior to taping with Gyproc Paper Tape.

Joint reinforcement
In a plasterboard system, suitable joint reinforcement is essential to minimise the risk of cracking along the joints, which could then appear through the decoration.

To achieve the objective of a smooth, continuous, crack-free surface, tapered edge plasterboard and Gyproc Paper Tape are widely regarded as best practice when jointing. The tapered edges provide a recess for the joint treatment, allowing a flat, finished surface. At board joints, where cut edges or square edge boards occur, the joint treatment is inevitably raised above the board surface and is more difficult to conceal. In this situation the secondary filling stage is omitted, and joint treatment is feathered-out into the field of the board to conceal the joint as much as possible.

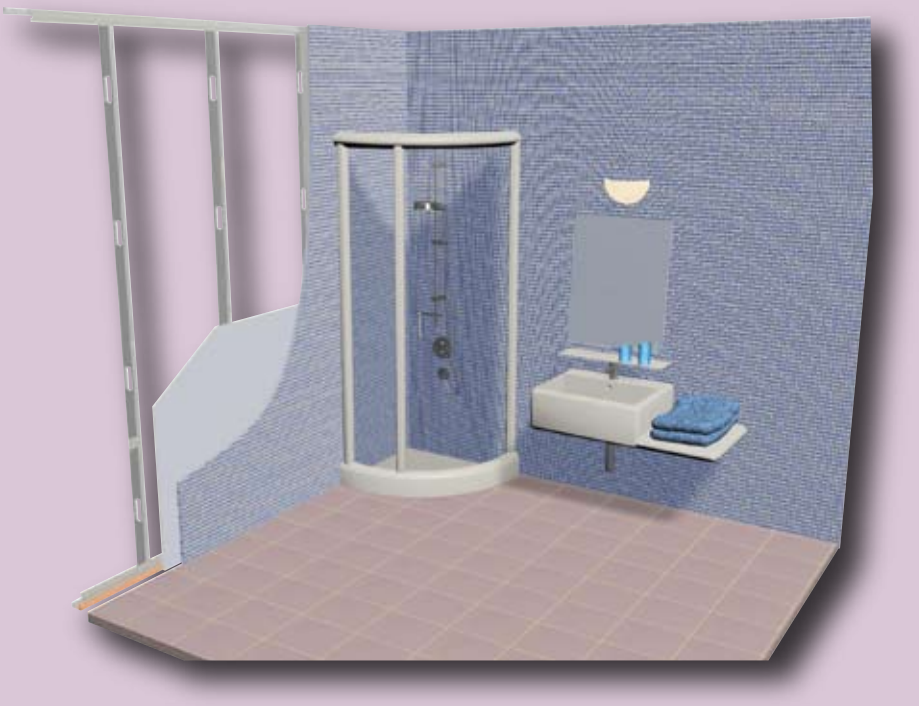
Joint treatment has two essential components; the reinforcement and the jointing compound. Reinforcement is necessary where there is relative movement of adjacent boards. In practice, some movement is normal and Gyproc Joint Tape is recommended for the best crack resistance. Gyproc Fibre Tape is an alternative, and can be easy and quick to install on flat joints. Gyproc Fibre Tape however, is not a direct substitute for Gyproc Paper Tape, as tests have shown that Gyproc Paper Tape provides superior resistance to cracking.

Table 1 – Combinations and coverage data (kg / 100 linear metres)

Jointing system	Reinforcement	Taping coat	1st finish coat	2nd finish coat
		coverage kg / 100 linear metres		
Flat joint (tapered edge)	Paper / Fibre tape	12	6	6
Flat joint (square edge)	Paper / Fibre tape	3	12	-
External angle	Corner tape	22	9	9
	Metal bead	34	9	9
Internal angle	Paper tape	12	8	8

• These quantities should be used as a guide only - quantities used will vary depending on tools used and accuracy of board alignment.
• Material used for pre-filling gaps, repairing damage, etc is not included.

Tiles can be applied to drylined walls or to the surface of lightweight partition systems. Tiling can be carried out in any type of building, either in dry areas or in areas subject to intermittent moisture conditions. Typical applications include domestic and commercial shower areas, toilets, bathrooms and kitchens. Tiles up to 12.5mm thick with a maximum weight of 32kg/m² (including grout and adhesive) can be accommodated. The tiles are fixed using a suitable adhesive.



Key facts

- Suitable for domestic and commercial showers, toilets, bathrooms and kitchens
- Tile weights up to 32kg/m² for drylined walls
- Moisture resistant board option for wet use areas

Applications

Kitchens and bathrooms.

Sector

✓ Sport and leisure
✓ Education
✓ Healthcare
✓ Housing
✓ Apartment buildings
✓ High-rise multi-occupancy

Tiling

System components

Board products

Gyproc Moisture Resistant

Thickness	12.5, 15mm
Width	1200mm

Gyproc FireStop MR

Thickness	12.5, 15mm
Width	1200mm

Gyproc DuraLine MR

Thickness	15mm
Width	1200mm

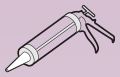
Glasroc F MULTIBOARD

Thickness	6mm
Width	1200mm

NB In dry conditions any paper faced Gyproc board is a suitable substrate for tiling.

NB Tapered edge plasterboards are normally used where part-height tiling occurs. Square edge boards can be used to suit full height and width tiling.

Fixing and finishing products



Waterproof sealant (by others)
For sealing cut edges.

Tiles (by others)

Thickness	Up to 12.5mm
Weight	32kg/m² (maximum including adhesive and grout)

Tile adhesive (by others)

Design

Planning - key factors
Gyproc moisture resistant (MR) grade boards or Glasroc F MULTIBOARD are recommended for intermittent moisture applications, including splashbacks. Alternatively, for splashbacks, boards may be coated with two coats of sealer to prepare for tiling. Cut edges of plasterboards must be appropriately sealed / caulked at abutments. The tolerance on the finished tile surface quoted in BS 5385: Part 1, i.e. 3mm under a 2m straightedge with thin-bed adhesives, is such that it will reflect very accurately the standard of the background surface. Tolerance standards for drylining and partition systems are also given in BS 8212.

Two coats of sealer applied to the face of standard grade plasterboards, with the edges adequately protected from moisture may also be suitable to receive a tile finish. The application of sealer provides surface water absorption resistance only, and does not meet the performance requirements for moisture resistant grade boards as defined in EN 520, type H1.

Detailing at junctions
Designers must give consideration to the precautions necessary at junctions to ensure that moisture is not allowed to penetrate or collect, e.g. at the base of walls where showers are specified with tiling to plasterboard, and at other junctions such as bath edges.

Perimeter sealing
Standard perimeter sealing methods around baths or shower trays are normally adequate. Caulking sealant can be used to form a fillet between the wall surface and the floor at the base of partition or wall lining to prevent any possible moisture being absorbed by the board core.

Continuity of linings
All partitions and wall linings should be complete. There should be no omissions to board linings, e.g. behind baths.

Tiling directly onto plasterboard
Before tiling commences, any tapered edge joints included within the tiling area should be filled with tile adhesive. Other areas are finished as normal.

Performance

Table 1 - Tiling on partition systems

System	Board type (including MR variants)	Thickness each side mm
GypWall ROBUST	DuraLine	15
GypWall CLASSIC, GypWall QUIET		
50mm, 70mm, and 100mm stud	Any single layer 15mm board, any double layer specification	15 2 x 12.5 2 x 15
150mm stud	Any single layer 15mm board, any double layer specification	15 2 x 12.5 2 x 15
GypWall AUDIO	Regular, FireStop	2 x 15 3 x 15 4 x 15
ShaftWall	FireStop	1 x 15 2 x 12.5 2 x 15

Table 2 - Tiling on drylined walls and independent wall lining

System	Board type (including MR variants)	Thickness mm
GypLyner IWL	Regular, FireStop, Moisture Resistant, DuraLine	15 2 x 12.5
GypLyner UNIVERSAL	Regular, FireStop, Moisture Resistant, DuraLine	12.5, 15

NB The recommendations giv en are based on experience and laboratory / site testing. In practice, performance will be dependent on factors such as workmanship and site conditions.

Stud centres mm	Additional support
400	N/A
400	N/A
600	Extra stud to give 300mm centres at tiling height
400 400 400	N/A
600	Studs at 300mm centres (or Gypframe 103 FC 50 Fixing Channel at 1200mm centres) for single layer lining specifications. The two layers of 12.5mm or 15mm plasterboard are bonded with a continuous bead of sealant midway between studs.

Support centers mm	Additional support centers
400 400	Mid-height support from framework to structure
400	Fixing brackets at 600mm centres

Gyproc plasterboards

Gyproc plasterboards are the ultimate lining solution for today's buildings, providing high levels of fire, sound, thermal, moisture and impact resistance to create modern internal environments that offer comfort and safety for occupants. They offer high quality, high performance linings for walls and ceilings, lift shafts and stairwells, corridors and auditoria, in buildings as diverse as houses, schools, hospitals and cinemas.

Bespoke products

Gyproc offers a comprehensive bespoke service for the Gyproc plasterboard and Gypframe metal product ranges. Whether you require a non-standard length, alternative edge profile or other specification change, we'll try to provide you with the best solution for your project.

Board product index

Gyproc Regular

Product Characteristics

Gyproc Regular plasterboard consists of an aerated gypsum core encased in, and firmly bonded to, strong paperliners. Gyproc Regular is a plasterboard that is suitable for drylining internal surfaces.

Applications

Suitable for most system applications where normal fire, structural and acoustic levels are specified. Can be finished using Gyproc Fibre Tape or Gyproc Paper Tape and Gyproc Jointing Compound. Suitable for direct decoration.

Board Colour

- Ivory face paper
- Brown reverse side paper

Manufacturing Standards

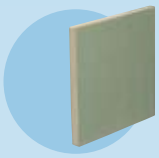
British Standard BS 1230 – Type 1
European Standard EN 520 – Type A
American Standard ASTM C1396 – Section 5

Product Matrix

Width (mm)	Length (mm)*	Edge Type
9mm		
1200	2400	T/E
1200	3000	T/E
1220	2440	T/E
12.5mm		
1200	2000	T/E
1200	2400	T/E
1200	2500	T/E
1200	2600	T/E
1200	2700	T/E
1200	2800	T/E
1200	3000	T/E
1220	2440	T/E
1220	3000	T/E
15mm		
1200	2400	T/E
1200	3000	T/E

* other lengths available on request

Gyproc Moisture Resistant



Product Characteristics

Gyproc Moisture Resistant consists of an aerated gypsum core with water repellent additives encased in, and firmly bonded to, strong Moisture Resistant paperliners that are green in colour. Gyproc Moisture Resistant is a plasterboard that is suitable for drylining internal surfaces.

Applications

Suitable as a base for tiling wet use areas, such as bathrooms and kitchens. Also used for external soffits in sheltered positions. Can be finished using Gyproc Fibre Tape or Gyproc Paper Tape and Gyproc Jointing Compound. Suitable for direct decoration.

Board Colour

- Green face paper
- Green reverse side paper

Manufacturing Standards

British Standard BS 1230 – Type 3 & 4
European Standard EN 520 – Type A & H1
American Standard ASTM C1396 – Section 7

Product Matrix

Width (mm)	Length (mm)*	Edge Type
12.5mm		
1200	2000	T/E
1200	2400	T/E
1200	2500	T/E
1200	2700	T/E
1200	2800	T/E
1200	3000	T/E
15mm		
1200	2400	T/E
1200	3000	T/E

* other lengths available on request

Gyproc FireStop

Product Characteristics

Gyproc FireStop consists of an aerated gypsum core with glass fibre and other additives encased in, and firmly bonded to, strong paperliners that are pink in colour. Gyproc FireStop is a plasterboard that is suitable for drylining internal surfaces.

Applications

Used in Gyproc partition, ceiling and shaftwall systems to give increased fire protection. Also used for protection to structural steel. Can be finished using Gyproc Fibre Tape or Gyproc Paper Tape and Gyproc Jointing Compound. Suitable for direct decoration.

Board Colour

- Pink face paper
- Brown reverse side paper

Manufacturing Standards

British Standard BS 1230 – Type 5
European Standard EN 520 – Type F
American Standard ASTM C1396 – Type X

Product Matrix

Width (mm)	Length (mm)*	Edge Type
12.5mm		
1200	2400	T/E
1200	2700	T/E
1200	2800	T/E
1200	3000	T/E
15mm		
1200	2400	T/E
1200	3000	T/E

* other lengths available on request

Gyproc FireStop MR

Product Characteristics

Gypsum plasterboard with glass fibre and water repellent additives in the core.

Gyproc FireStop MR consists of an aerated gypsum core with glass fibre and water repellent additives encased in, and firmly bonded to, strong moisture resistant paperliners that are pink in colour. Gyproc FireStop MR is a plasterboard that is suitable for drylining internal surfaces.

Applications

Used in Gyproc partitions where increased fire protection is required combined with moisture performance. Can be finished using Gyproc Fibre Tape or Gyproc Paper Tape and Gyproc Jointing Compound. Suitable for direct decoration.

Board Colour

- Pink face paper
- Green reverse side paper

Manufacturing Standards

British Standard BS 1230 – Type 3, 4 & 5
European Standard EN 520 – Type F & H1
American Standard ASTM C1396 – Type X & Section 7

Product Matrix

Width (mm)	Length (mm)*	Edge Type
12.5mm		
1200	2400	T/E
1200	2700	T/E
1200	2800	T/E
1200	3000	T/E
15mm		
1200	2400	T/E
1200	3000	T/E

* other lengths available on request

Gyproc DuraLine[1]

Product Characteristics

Gyproc DuraLine consists of an higher density aerated gypsum core with glass fibre and other additives encased in, and firmly bonded to, strong paperliners that are yellow in colour. Gyproc DuraLine is a plasterboard that is suitable for drylining internal surfaces.

Applications

Designed for use in the Gyproc GypWall ROBUST system to give greater impact resistance in heavy use areas. Can be finished using Gyproc Fibre Tape or Gyproc Paper Tape and Gyproc Jointing Compound. Suitable for direct decoration.

Board Colour

- Yellow face paper
- Brown reverse side paper

Manufacturing Standards

British Standard BS 1230 – Type 5
European Standard EN 520 – Type D, F, I & R
American Standard ASTM C1396 – Type X & Section 7

Product Matrix

Width (mm)	Length (mm)*	Edge Type
15mm		
1200	2400	T/E
1200	3000	T/E

[1] also available in MR subject to minimum order quantities

* other lengths available on request

Gyproc CoreBoard

Product Characteristics

A 19mm thick version of Gyproc FireStop MR board Gyproc CoreBoard consists of an aerated gypsum core with glass fibre, water repellent and other additives encased in, and firmly bonded to strong moisture resistant paperliners.

Applications

Used as the main board in the Gyproc ShaftWall system to provide fire protection with temporary moisture protection during construction.Can be finished using Gyproc Fibre Tape or Gyproc Paper Tape and Gyproc Jointing Compound. Suitable for direct decoration.

Board Colour

- Green face paper
- Green reverse side paper

Manufacturing Standards

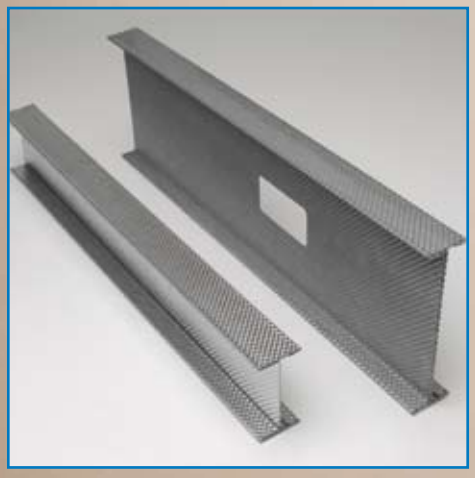
British Standard BS 1230 – Type 3, 4 & 5
European Standard EN 520 – Type D, F & H1
American Standard ASTM C1396 – Type X & Section 7

Product Matrix

Width (mm)	Length (mm)*	Edge Type
19mm		
598	3000	S/E

* other lengths available on request

Metal components



Metal components

Gypframe metal components

Gypframe metal stands for quality, strength and durability through a range of components that provide the backbone for our tested and warranted wall, ceiling, lining and encasement systems.

The unique manufacturing process, including the patented UltraSteel™ double helix work hardening process, means that Gypframe metal components are:

- Precision engineered for premium quality
- Lighter to carry and handle
- Easier to cut and fit
- Rigidised for extra strength
- Allow enhanced screw fixing and retention
- The only metal components to carry the
- SpecSure system performance warranty when installed in our proprietary systems

Benefits of Gypframe:

- Galvanised steel that will not warp or rust
- Easy to cut on site, saving time and creating no mess
- Limited waste - any off-cuts can be recycled
- Self locking studs and channels, that are quick to install
- Lightweight – easy to move around site and build to greater height
- Improved screw retention and strip out strength
- Improved resistance to screw pull-out

Manufacturing Standards:

All Gypframe components are rigourously tested to internationally recognised product standards and conform to.

- British Standard BS 7364
- European Standard EN 14195
- American Standard ASTM C473

Metal components index

Metal components

Bespoke Gypframe

Gyproc offers a comprehensive bespoke service for the Gyproc plasterboard and Gypframe metal product ranges. Whether you require a non-standard length, alternative gauge or other specification change, we'll try to provide you with the best solution for your project. Specifying bespoke metal lengths can speed up construction as there is no need to trim them to the correct length, and will save waste on site, helping with site safety and cost reduction.

Gypframe reference codes and abbreviations

To understand a Gypframe metal product, follow these simple steps:

Step 1

The first 2 or 3 digits refer to the component width

Step 2

The letter refers to the product type i.e., S = Stud, C = Channel

Step 3

The last two digits indicate the metal thickness or gauge in mm i.e., 0.50mm

See example below

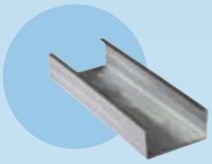
70 I 70

Component width in mm Example = 70mm	Component type Example = 'I' Stud	Stud gauge Example = 0.70mm

Key	Gypframe Component	Flange Dimension
S	'C' Stud	32mm / 34mm
I	'I' Stud	38mm
C	Floor and Ceiling Channel	25mm
DC	Deep Flange Floor and Ceiling Channel	50mm
EDC	Extra Deep Flange Floor and Ceiling Channel	70mm
RC	Retaining Channel	15mm
SC	Starter Channel	30mm
MF5	Furring Channel	69mm x 22mm
MF7	Main Channel	38mm x 12.5mm
GA1	Wall Angle	25mm x 25mm
GL1	GypLyner Channel	38mm x 12.5mm

Gypframe Explained

Gypframe 'C' Studs



Product Characteristics

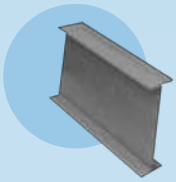
Used as the vertical support in wall framing. A range of widths, lengths and thicknesses depending on requirements for strength, height, impact resistance and sound insulation. Manufactured using patented, UltraSteel™ technology giving a rigidised surface for additional strength. Service cut-outs are also placed along the spine of Gypframe 'C' Studs providing easy routing of services through the partition.

Product Matrix

Component^	Length (mm)*
50 S 50	3000
63 S 50	3000
70 S 50	3000
73 S 50	3000
100 S 50	3000
150 S 50	3000

^ - Also available in 0.6, 0.7, 0.8 and 0.9 thickness
* - Bespoke lengths available on request

Gypframe 'I' Studs



Product Characteristics

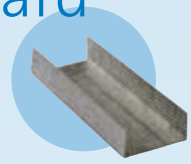
These studs are the strongest available in the Gypframe range. They allow for increased partition height, without increasing the partition width, and provide improved impact resistance. Commonly used in ShaftWall, Gyplyner IWL, GypWall QUIET IWL and other GypWall systems. Service cut-outs are also spaced along the spine of the Gypframe 'I' Stud, providing easy routing of services through a partition.

Product Matrix

Component	Length (mm)*
70 I 70	3000
100 I 80	3000
150 I 90	3000

* - Bespoke lengths available on request

Gypframe Standard Channels



Product Characteristics

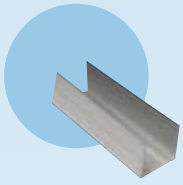
Gypframe channels are used for securing Gypframe 'C' Stud at floor and ceiling junctions. Gypframe Channels (C) are used for partition heights of up to 4200mm and are manufactured using the patented UltraSteel™ process giving a rigidised surface for additional strength.

Product Matrix

Component^	Length (mm)*
52 C 50	3000
65 C 50	3000
72 C 50	3000
75 C 50	3000
102 C 50	3000
152 C 50	3000

^ - Also available in 0.6, 0.7, 0.8 and 0.9 thickness
* - Bespoke lengths available on request

Gypframe Deep Channels



Product Characteristics

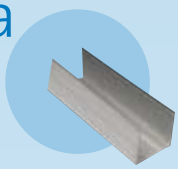
Gypframe channels are used for securing Gypframe 'C' Stud at floor and ceiling junctions. Gypframe Deep Channels (DC) are used for partition heights between 4200mm and 8000mm or in situations where deflection heads or improved impact resistance are required. Deep Channels are manufactured using the patented UltraSteel™ process giving a rigidised surface for additional strength.

Product Matrix

Component^	Length (mm)*
52 DC 60	3000
65 DC 75	3000
72 DC 60	3000
102 DC 60	3000
152 DC 60	3000

^ - Also available in 0.7, 0.8 and 0.9 thickness
* - Bespoke lengths available on request

Gypframe Extra Deep Channels



Product Characteristics

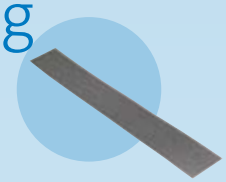
Gypframe channels are used for securing Gypframe 'C' Stud at floor and ceiling junctions. Gypframe Extra Deep Channels (EDC) are used for partition heights over 8000mm or in situations where deflection head details or improved impact resistance is required. Extra Deep Channels are manufactured using the patented UltraSteel™ process giving a rigidised surface for additional strength.

Product Matrix

Component^	Length (mm)*
52 EDC 80	3000
72 EDC 80	3000
102 EDC 80	3000
152 EDC 80	3000

* - Bespoke lengths available on request

Gypframe Fixing Strap



Product Characteristics

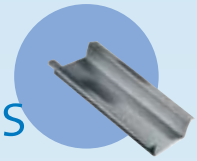
Used to maintain board fixings along horizontal joints in multi-layer boarded systems.

Product Matrix

Component	Thickness (mm)	Length (mm)*
GFS1	0.5	3000

* - Bespoke lengths available on request

Gypframe MF Ceiling Channels



Product Characteristics

Gypframe MF Ceiling Channels are used for providing a robust false ceiling system. These sections are manufactured using the patented UltraSteel™ process giving a rigidised surface for additional strength and improved fixing.

Product Matrix

Component	Thickness (mm)^	Length (mm)*
MF5 (Furring) Section	0.5	3000
MF7 (Main) Channel	0.5	3000
GA1 Angle	0.5	3000

^ - Also available in 0.6, 0.7, 0.8 and 0.9 thickness
* - Bespoke lengths available on request

Gypframe GypLyner Stud & Channels

Product Characteristics

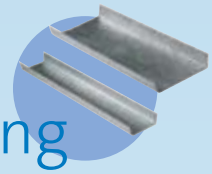
These components are designed to aid the installation of plasterboard linings directly to concrete and blockwork walls. They are manufactured using the patented UltraSteel™ process giving a rigidised surface for additional strength and improved fixing.

Product Matrix

Component	Thickness (mm)^	Length (mm)*
GL1 Stud	0.5	3000
GL2 Bracket	-	Box
GA1 Angle	0.5	3000

^ - Also available in 0.7 thickness
* - Bespoke lengths available on request

Gypframe Angle, Starter & Retaining Channels for ShaftWall



Product Characteristics

These products are used for the high performance ShaftWall system used to create lift shaft and service riser linings that can be constructed from one side and provide structural and fire protection applications.

Product Matrix

Angle	Length (mm)*
GA3	3000

Starter Channels	Length (mm)*
70 SC 70	3000
100 SC 80	3000
150 SC 90	3000

Retaining Channels	Length (mm)*
RC 70	3000
RC 100	3000
RC 150	3000

* - Bespoke lengths available on request

ShaftWall

Shaft and duct encasement system

Gyproc plasterboard accessories

To achieve the high performance requirements of a complete Gyproc system solution, a range of superior quality accessories are available. This includes performance tapes, high-strength screws and jointing compounds that achieve seamless joints.

Gyproc deliver the very best tried and tested products that adhere to stringent international standards as well as Gyproc's own rigorous product performance assessment.

Gyproc accessories index

Gyproc Jointing Compound Ready Mixed

Product Characteristics

A high quality, ready to use, air-drying jointing compound, that can be applied quickly and easily to fill and finish plasterboard joints. A low shrinkage product most commonly hand applied with a working time of approximately 60 minutes, depending upon environmental conditions. For use in all stages of plasterboard jointing to achieve a fine, smooth finish that can be easily sanded as required.

- Excellent workability for easier application
- Increased crack resistance for seamless joints
- Low shrinkage, reducing material required
- Easy sanding for a smooth finish

Manufacturing Standards

European Standard EN 13963
American Standard ASTM C474/C475

Product Matrix

Type	Weight (Kg)
Gyproc Jointing Compound Ready Mixed	28

Gyproc Fibre Tape

Product Characteristics

Self-adhesive glass-fibre mesh tape for joint reinforcement in tape and joint situations and also plastered finishes to plasterboard joints. Gyproc Fibre Tape is suitable for flat joints and repairs to small areas of damaged plasterboard. Provides crack resistance.

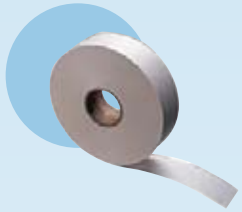
Manufacturing Standards

European Standard EN 13963 - Type T

Product Matrix

Width (mm)	Length (m)
Gyproc Fibre Tape	
50	90

Gyproc Paper Tape



Product Characteristics

A paper tape with added tensile strength to prevent tearing, wrinkling or stretching. The centre crease allows simplified application in corners, whilst chamfered edges and spark perforations prevent bubbling and blistering. Also designed for reinforcing flat joints when finishing plasterboard joints. Provides improved resistance against cracking.

Manufacturing Standards

European Standard EN 13963 - Type T

Product Matrix

Width (mm)	Length (m)
Gyproc Paper Tape	
50	150

Gyproc Drywall Screws

Product Characteristics
High performance, corrosion resistant self-tapping zinc plated steel screws with countersunk cross-heads. Ideal for fixing plasterboard to light gauge steel framing up to 0.79mm thick. The length of screw selected should be sufficient to give a nominal 10mm penetration into metal framing. Supplied with screwdriver bits.

Manufacturing Standards
European Standard EN 14566 - Type A1

Product Matrix

Length (mm)	Box Quantity
Gyproc Drywall Screws	
25	1000
35	1000
42	1000
55	500

Gyproc Jack Point Screws

Product Characteristics
Corrosion resistant self-tapping zinc plated steel screws with countersunk cross-heads. Ideal for fixing plasterboard to stud framing 0.8mm thick or greater and 'I' Studs greater then 0.7mm thick. The length of screw selected should be sufficient to give a nominal 10mm penetration into metal framing. Supplied with screwdriver bits.

Manufacturing Standards
European Standard EN 14566 - Type A1

Product Matrix

Length (mm)	Box Quantity
Gyproc Jack Point Screws	
25	1000
35	1000
42	1000
55	500

Gyproc Wafer Head Screws

Product Characteristics
Corrosion resistant self-tapping zinc plated steel screws with wafer cross-head. Designed for metal-to-metal fixing of light gauge steel framing up to 0.79mm thick. Supplied with screwdriver bits.

Manufacturing Standards
European Standard EN 14566 - Type A1

Product Matrix

Length (mm)	Box Quantity
Gyproc Wafer Head Screws	
13mm	1000

Gyproc Jack Point Wafer Head Screws

Product Characteristics
Corrosion resistant self-tapping zinc plated steel screws with wafer cross-head and self-drilling points. Designed for metal-to-metal fixing of light gauge steel framing 0.8mm thick or greater and 'I' studs greater than 0.7mm thick. Supplied with screwdriver bits.

Manufacturing Standards
European Standard EN 14566 - Type A1

Product Matrix

Length (mm)	Box Quantity
Gyproc Jack Point Wafer Head Screws	
13mm	1000

Perforated acoustic gypsum products

Gyptone boards, ceiling tiles and planks

The Gyptone range of products combine aesthetic and acoustic performance with the unique environmental properties of gypsum. The range consists of boards, tiles and planks in a choice of perforated and non-perforated designs. Gyptone is the natural choice for the ideal design-statement acoustic ceiling system.

Ceilings index

Gyptone boards

Boards

Gyptone tiles

Tiles

Gyptone bend

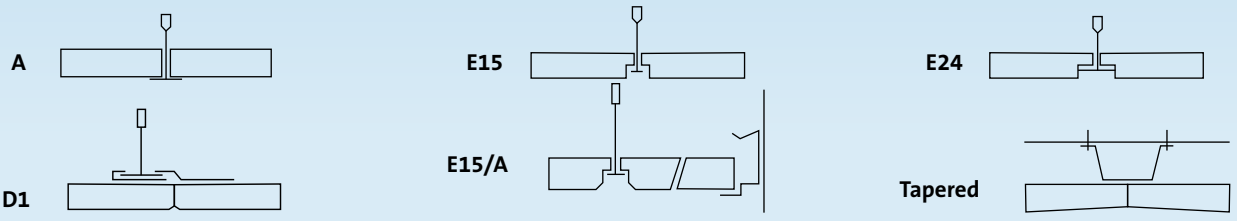
Bend

Gyptone plank

Plank

Edge details

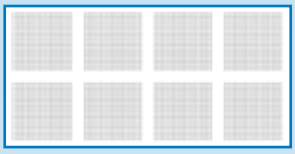
Gyproc ceiling systems create a new flexibility in design and construction. The wide range of products give fresh and creative freedom for interior designers, enabling them to fully realise the visual and acoustic ambience of their designs. The products are available in seven edge profiles as shown below:



Perforated acoustic gypsum products

Boards

QUATTRO 41



Product Characteristics

Achieves high levels of sound absorption with a 12mm square cut out design giving a total perforated area of 16%.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
1200	2400	T/E

QUATTRO 42

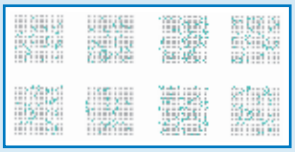
Product Characteristics

Good acoustic absorption with a 12mm square cut out design giving a total perforated area of 10%.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
1200	2400	T/E

QUATTRO 46



Product Characteristics

Good levels of sound absorption with a 12mm square cut out design giving a total perforated area of 10%.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
1200	2400	T/E

QUATTRO 47

Product Characteristics

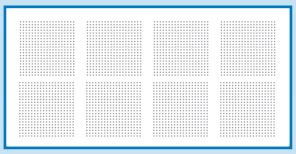
Comprising 12mm square cut out design with a perforated area of 10% and offering good level of sound absorption.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
1200	2400	T/E

Boards

SIXTO 63



Product Characteristics

An 11mm hexagonal perforation design giving a total perforated area of 13%. Provides good levels of sound absorption.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
1200	2400	T/E

LINE 6

Product Characteristics

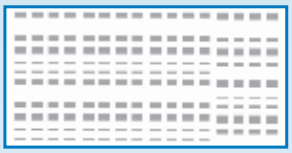
A line cut out design of 6mm x 80mm giving a total perforated area of 13% and high levels of sound absorption.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
1200	2400	T/E

Bend

LINE 7



Product Characteristics

LINE 7 is a 6.5mm thick board with 6mm x 80mm line perforations making it possible to create curved / arched ceilings to a minimum radius of 1200mm. Comprises of a perforated area of 14%, giving a good level of sound absorption.

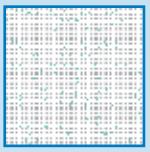
Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
1200	2400	E15

Perforated acoustic gypsum products

Tiles

QUATTRO 20



Product Characteristics
Pre-finished white tile with 9mm square perforations, backed by special sound absorbent tissue. A perforated area of 18% provides high levels of sound absorption.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
600	600	D1
600	600	E15

QUATTRO 22

Product Characteristics
Pre-finished white tile with 9mm square perforations, backed by special sound absorbent tissue. Used in conjunction with QUATTRO 20 tiles, the unperforated area allows the installation of services, such as lights, into the ceiling. Perforated area 9%.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
600	600	D1
600	600	E15

QUATTRO 50

Product Characteristics
Pre-finished white tile will 12mm square perforations. Comprises a perforated area of 18%, giving a good level of sound absorption performance.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
600	600	E15

LINE 4

Product Characteristics
Pre-finished white tile with 6mm x 95mm line perforations, backed by special sound absorbent tissue. Achieves high levels of sound absorption from an 18% perforated area.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
600	600	E15

Tiles

SIXTO 60

Product Characteristics
Pre-finished white tile with 11mm hexagonal and a perforation perforated area of 17% providing high levels of sound absorption.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
600	600	D1
600	600	E15

POINT 11

Product Characteristics
Pre-finished white tile with 6.5mm diameter round perforations, backed by special sound absorbent tissue. Achieves high levels of sound absorption from a 12% perforated area.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
600	600	E15

POINT 12

Product Characteristics
Pre-finished white tile with 6.5mm diameter round perforations, backed by special sound absorbent tissue. Used in conjunction with POINT 11 tiles, the unperforated area allows the installation of services, such as lights, into the ceiling. Perforated area 5%.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
600	600	E15

BASE

Product Characteristics
Pre-finished white un-perforated tile. Used in conjunction with **LINE, QUATTRO, SIXTO** and **POINT** tiles to create distinctive ceiling designs. Ideal for use in corridor areas.

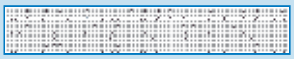
Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
600	600	E15

Perforated acoustic gypsum products

Plank

QUATTRO 55



Product Characteristics

Pre-finished white plank with 12mm square perforations, backed by special sound absorbent tissue. Suitable for use in corridors to provide sound absorption from a 15% perforated area.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
300	1800	E15/A
300	2100	E15/A
300	2400	E15/A

LINE 8

Product Characteristics

Pre-finished white plank with 6mm x 80mm line perforations, backed by special sound absorbent tissue. Achieves high levels of sound absorption from a 15% perforated area. Planks are ideal for use in corridor areas.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
300	1800	E15/A
300	2100	E15/A
300	2400	E15/A

POINT 15

Product Characteristics

Pre-finished white tile with 6.5mm diameter round perforations backed by special sound absorbent tissue. Suitable for use in corridors to provide sound absorption from the 15% perforated area.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
300	1800	E15/A
300	2100	E15/A
300	2400	E15/A

BASE 33

Product Characteristics

Pre-finished white un-perforated plank. Used in conjunction with **LINE, QUATTRO, SIXTO** and **POINT** planks to create distinctive ceiling designs. Ideal for use in corridor areas.

Product Matrix

Width (mm)	Length (mm)	Edge Detail
12.5mm		
300	1800	E15/A
300	2100	E15/A
300	2400	E15/A

Perforated acoustic gypsum products

Glossary

Angle bead
A metal or plastic angle used to reinforce external corners, e.g. Gyproc angle bead.

Bonding agent
Liquid preparation applied to the wall or ceiling surface prior to plastering to provide adhesion to challenging backgrounds.

Caulk
A joint sealing material, applied in a plastic state.

Control joint
A joint which accepts movement in the form of lateral expansion or contraction. Allows relatively small movements to occur without damage to the internal surface.

Core board
A version of fire-resistant and moisture resistant plasterboard with square edges and green coloured paper liners supplied in 19mm thickness. Used as an inside stud (core) board in shaft wall systems, e.g. Gyproc CoreBoard.

Cove
A concave decorative moulding used at the wall to ceiling angle.

Cut end
End of a gypsum board showing the exposed core.

Decibel (dB)
A unit of magnitude for Sound Pressure, Sound Intensity, Sound Power and, in relation to Sound Insulation, the measurement oflevel reduction. Impact sound insulation, dB, is a measure of sound level.

Deflection head
A special design feature at the head of a partition, which allows its integrity to be maintained while allowing movement such as floor slab or beam deflection to take place.

Dew point
The temperature at which air becomes saturated with water vapour and below which condensation occurs.

Door set
A complete unit consisting of a door frame and door leaf or leaves, supplied with essential hardware as a product from a single source.

DPC
A damp-proof course (often abbreviated to DPC) providing a horizontal barrier in a wall designed to prevent moisture rising through the structure by capillary action.

Dry construction
A general term describing wall linings, ceiling linings, lightweight partitions and separating walls in board or sheet materials, either self-finished or jointed as distinct from construction with solid plaster finishes.

Drying shrinkage
Shrinkage caused by the evaporation of water.

Drylining
Creating a wall or ceiling lining using plasterboard as an internal finish instead of solid plaster treatment.

Drywall partition
Lightweight non-loadbearing construction, either self-finished or jointed as distinct from masonry construction with solid plaster finishes.

Drywall
A partition, separating wall or wall lining which uses plasterboard as a lining instead of solid plastering.

DSG
Desulphurised gypsum. A synthetic gypsum produced as a by-product of the desulphurisation process at coal-fired power stations.

Dual-purpose compound
Jointing compound suitable for use as a bedding compound and as a finishing compound in a jointing process, e.g. Gyproc Jointing Compound.

Edge profile of plasterboard
The bound edge of a plasterboard which is commonly square or tapered.

Edge bead
A metal or plastic strip to protect the edges of plasterboard or to form a feature, e.g. Gyproc Drywall Metal Edge Bead.

Efflorescence
Formation of crystals on a surface during drying, caused by the presence of soluble salts.

Expansion joint
A permanent joint between different parts of the structure to allow relatively small movements to occur without damage to the surface.

Face
The side of the plasterboard from which the covering paper is carried round the edges, e.g. the exposed side for direct decoration.

Field of board
The face of plasterboard excluding the perimeter.

Finishing compound
Jointing material applied over the bedding compound in one or more applications and which forms the final finished surface.

Fire door
A door that provides fire resistance.

Fire-resistant and moisture resistant plasterboard
A fire-resistant plasterboard with water repellent and other additives in the core, e.g. Gyproc FireStop MR.

Fire-resistant plasterboard
A gypsum plasterboard with greater fire protection properties than standard plasterboard, e.g. Gyproc FireStop.

Fixed partition
A partition that cannot be demounted without destroying, partially or totally, the integrity of the components.

Flanking sound
The structure-borne transmission of sound between adjacent rooms or spaces, which bypasses the obvious dividing barriers.

Floating floor
Part of a composite floor construction whereby the upper surface membrane (possibly a concrete screed or timber deck) is independently isolated (floated) from the lower structural floor by the use of a resilient underlay, an array of flexible pads, spring isolators or battens.

Framed partition
A partition consisting of a continuously supported frame with facings or infillings. It may take the form of a stud and sheet, frame and sheet or frame and panel partition, e.g. GypWall CLASSIC.

Furring
Timber or metal channels used to even-up a surface - on a wall for example, to provide a true surface to which plasterboards can be fixed, e.g. GypLyner GL1 channel used with GL2 brackets.

Glass mineral wool
Mineral wool manufactured from glass used for improved thermal or acoustic insulation, e.g. Isover.

GRG board
A gypsum board having a glass fibre reinforced core and continuous glass fibre membranes just below each surface, e.g. Glasroc F FIRECASE and Glasroc F MULTIBOARD.

Gypsum
Calcium sulphate dihydrate (CaSO4.2H2O). A natural mineral deposit and the main raw material from which gypsum products are made.

Gypsum adhesive
A gypsum-based compound that, when mixed with water, provides an adhesive for use in drylining systems.

Gypsum fibre board
A building board, complying with BS EN 15283-2: 2008, composed of gypsum, reinforced with fibres, e.g. Rigidur H.

Gypsum plaster, hemihydrate
Plaster, mainly of gypsum, from which approximately three quarters of the water has been removed.

Gypsum plaster, pre-mixed lightweight
Plaster in which a lightweight aggregate has been pre-mixed dry with a hemihydrate gypsum plaster to give low density.

Gypsum plasterboard
A building board, complying with BS 1230 / EN 520 / ASTM C1396, composed of a core of aerated gypsum plaster bonded between two sheets of strong paper, e.g. Gyproc Regular.

Hacking
The roughening of solid backgrounds by hand or mechanical means to provide a suitable key.

Hairline crack
Crack just visible to the naked eye.

Impact resistant plasterboard
A gypsum plasterboard with a heavier duty face paper, a higher density core than standard plasterboard, and additives in the core to improve impact performance, e.g. Gyproc DuraLine.

Impact sound
Sound produced when short duration sources, e.g. footsteps and door slams, impact directly onto a structure.

Independent wall lining
A lining (often using related partition components), which is erected independently of the external walling, e.g. GypLyner IWL.

Insulating drylining
Drylining using individual pieces or laminates composed of plasterboard and polystyrene, phenolic foam or mineral wool.

Glossary

Joint tape
Tape that is embedded in the bedding compound to reinforce the joint, e.g. Gyproc Joint Tape.

Jointing
The process of using hand or mechanical systems for achieving a flush seamless surface on dry construction, based on tapered edge plasterboard and applicable to walls and ceilings.

Key
The roughness of a surface that enables plaster to make a mechanical bond with it.

Lath
Expanded metal mesh that is fixed to a surface to provide a mechanical key for plaster.

Masonry partition
A partition of brickwork or blockwork complete with any specified surface finishes, such as a drylining or plaster.

Metal stud partition
A partition consisting of a metal stud / channel framework and lined both sides with sheet materials, such as plasterboard. This is a form of stud and sheet partition, e.g. GypWall CLASSIC.

Metal stud separating wall
A metal stud / plasterboard partition that meets the separating wall requirements for multi-occupancy dwellings, e.g. GypWall QUIET.

Moisture resistant plasterboard
A gypsum plasterboard with moisture-repellent additives in the core, which is enclosed in water-repellent green coloured paper liners, e.g. Gyproc Moisture Resistant.

Nogging
Cross member between main members of a framed construction. Also known as a 'dwang'.

Noise
Unwanted sound resulting in distraction and disturbance, interference with speech and stress or damage to hearing.

Panel
Decorative or functional portion of the cladding of a floor, ceiling, roof or wall supported by a concealed or exposed frame.

Partition
A non-loadbearing vertical construction dividing space, e.g. GypWall CLASSIC.

Pattern staining
Surface staining that sometimes occurs when the two sides of a composite structure are consistently exposed to different temperatures.

Perforated ceiling
A ceiling incorporating tile or board products available in various edge profiles and with circular, square or rectangular perforations in random or regular pattern designs, typically used in suspended ceilings to provide sound absorption, e.g. Gyptone.

Performance partitions
Partitions that have enhanced sound insulation, fire resistance, impact resistance, or a combination of these, e.g. GypWall ROBUST or GypWall QUIET.

Plenum
An enclosed chamber, e.g. space between a suspended ceiling and the floor above.

Racking resistance
A measure of a structure's ability to resist horizontal forces, such as wind loading.

Rendering coat
First coat of plaster on a wall.

Reverberation
The persistence of sound in an enclosure, due to its continued reflection or scattering from surfaces or objects, after the sound source has ceased.

Sarking board
Sheet material fixed to roof framework to contribute to weather protection, which may provide a degree of racking resistance.

Sealant
Joint sealing material, applied in a plastic state.

Security partitions
Constructions specifically designed to be resistant to ballistic and physical attack and explosions, such as those from letter or car bombs, e.g. GypWall SECURE or BlastWall.

Self-drilling, self-tapping
Shank and point design of a metal screw that facilitates penetration and grip into a light gauge metal section.

Shaft wall
A partition or lining used to form fire protective enclosures to all forms of shafts, including service cores and lift shafts. It consists of multiple layers of gypsum plasterboard fixed to single or twin metal frames to give fire resistance, e.g. ShaftWall.

Sheathing board
Sheet material used in framed structures. Fixed to external wall framework to contribute to weather protection, it may provide a degree of racking resistance.

Skin
A single thickness of panelling or cladding or one leaf of a cavity wall. Single skin or double skin are used to describe a lining consisting of one or two skins of plasterboard.

Soffit
Any semi-exposed under-surface.

Sound absorption
Sound absorption is the loss of sound energy when striking or transmitting into a boundary surface material or obstacle, or when causing a volume of air to resonate.

Sound leakage
Airborne sound transmission via gaps or cracks around or through building elements and services that allow sound to escape from one area to an adjacent area, and thus lower the element's potential sound reduction properties.

Square edge boards
Plasterboard with a square edge profile used for textured finishes or undecorated applications, as well as being suitable to receive gypsum plaster.

Stone wool
Mineral wool manufactured from stone, used to improve fire resistance performance.

Stud
Vertical member in framed wall or partition.

Suction
Moisture absorption of background.

Suspended ceiling
A ceiling formed with boards or tiles fixed into (or onto) a grid with a cavity between the suspension system and the structural soffit, joists or trusses, e.g. Gyproc MF.

Suspension system
Grid of metal sections, consisting of main and cross members, to support ceiling panels.

t&g
Tongue and groove (often abbreviated to t&g), a method of fitting similar objects together, edge to edge, is used mainly with timber constructions. Tongue and groove joints allow two sections to be joined together to create a single flat surface.

Tapered edge
A design of a board or sheet material applicable to plasterboard particularly, and to its long bound edges to enable flush seamless jointing or plastering to be carried out in dry construction.

Thermal laminate
A laminate consisting of gypsum plasterboard with a backing of factory bonded insulation material, providing enhanced thermal insulation. Used to provide insulated wall and soffit linings or ceilings.

Undercoats
Gypsum plaster or cement render coats other than the final coat.

Vapour control layer
A material (usually a membrane) that reduces the transfer of water vapour through a building element in which it is incorporated.

Working time
The period during which a plaster mix is workable, i.e. does not significantly stiffen.

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Notes

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