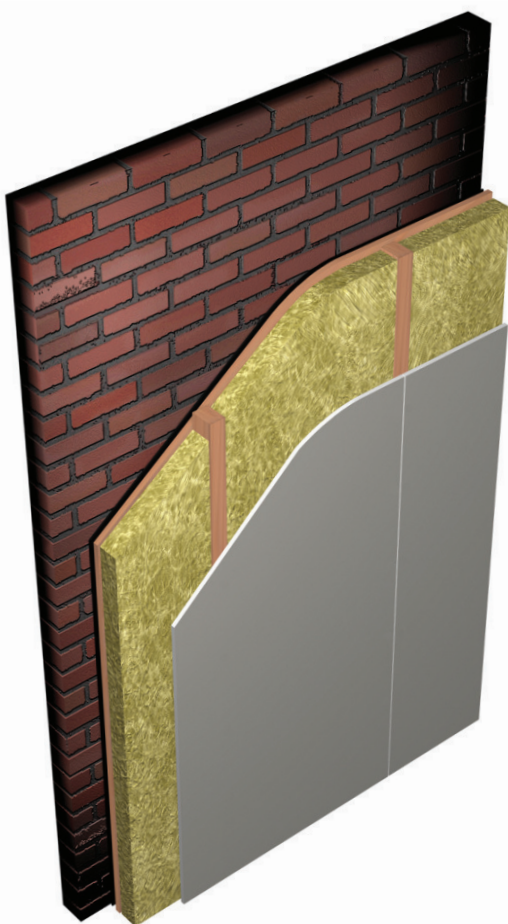


# Timber frame external walls

Gyproc plasterboards are used as the internal lining to structural timber frame walls.

The external wall construction is based on a structural timber frame comprising factory-produced timber panels and components to which sheathing board and a breather membrane is attached. The frame is tied to the external cladding using flexible wall ties. Isover glass mineral wool insulation is included in the stud cavity, and Gyproc plasterboard forms the internal lining. The board is either a vapour check grade (such as duplex options), or is backed with a suitable vapour control layer.

Gyproc plasterboard linings are quick and easy to install, and provide a lining which can be jointed with Gyproc jointing materials to give a seamless finish ready for direct decoration. The lining can also be skimmed with plaster to give a superior, traditional finish.



## Key facts

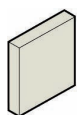
- U-values down to 0.27 W/m<sup>2</sup>K
- Maintains a clear wall cavity
- Gyproc thermal laminates can be specified to achieve enhanced U-values
- Gyproc duplex grade boards and 28mm Gyproc ThermalLine platinum provide an internal lining incorporating a vapour control layer

## Sector Guide

Offices	Commercial	Retail	Sport & Leisure	Education	Healthcare	Industrial	Auditoria	Custodial	Entertainment	Residential - Housing	Residential - Apartments	Residential - High Rise
✓	✓			✓	✓					✓	✓	✓

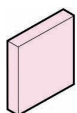
## COMPONENTS

### Gyproc board products



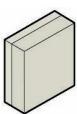
#### Gyproc WallBoard

Thickness 12.5, 15mm  
Width 1200mm



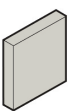
#### Gyproc FireLine

Thickness 12.5mm  
Width 1200mm



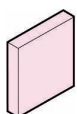
#### Gyproc ThermalLine platinum (with integral vapour check)

Thickness 28mm  
Width 1200mm



#### Gyproc WallBoard duplex

Thickness 12.5, 15mm  
Width 1200mm



#### Gyproc FireLine duplex

Thickness 12.5, 15mm  
Width 1200mm

### Fixing and finishing products



#### Gyproc Drywall Timber Screws

For fixing boards to normal softwoods, super-dried timber and engineered 'I' beams.



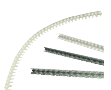
#### Gyproc Sealant

Sealing airpaths for optimum sound insulation.



#### Gyproc jointing materials

For seamless jointing.



#### Gyproc edge and angle beads

Protecting and enhancing board edges and corners.



#### Gyproc Skimcoat, Gyproc Carlite Finish, Gyproc Board Finish

To provide a plaster skim finish.

### Insulation products



#### Isover Frame Batt 32

50mm and 90mm, to achieve thermal and acoustic performance.



#### Isover Cavity Barrier

For sealing the cavity between the outer brick wall and the internal timber frame leaf.

### Health and Safety

Safety Data Sheets for all Gypsum Industries' products are available to download from our website [www.gypsum.ie](http://www.gypsum.ie), or via our Technical Sales Department.

## INSTALLATION OVERVIEW



### Erecting the timber frame

Factory manufactured timber wall panels of the required dimensions are installed to form the structural building frame. Additional framing members are normally incorporated into wall units during factory construction, in the required positions, to accommodate door / window openings, adjoining partitions, and support heavy fixtures. Sheathing board and breather membrane are installed as specified. Electrical and other services are located within the stud cavity. Timber noggings are installed to support recessed switch boxes / socket outlets.

Installation of the loadbearing timber framework, sheathing board and breather membrane, should be carried out according to established timber frame building principles with reference to the ITFMA (Irish Timber Frame Manufacturers' Association) guidelines. A number of cladding options are available and the method of securing or tying-back the cladding will be determined by the designer.

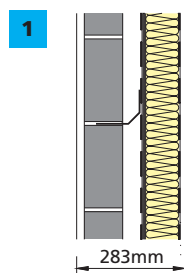
### Installing the insulation and lining

Isover Frame Batt 32 is friction-fitted in the stud cavity. Boards are fixed to framing members using Gyproc Drywall Timber Screws as specified.

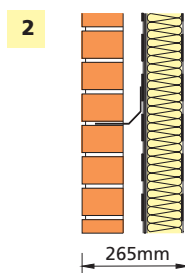
For full installation details, refer to the Installation Guide at [www.gypsum.ie](http://www.gypsum.ie)

**PERFORMANCE**

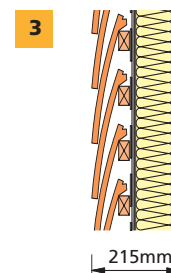
Refer to section 5.1 Introduction for general considerations.

**Table 2 Timber frame external walls – performance<sup>1</sup>**

Cladding of 100mm aggregate block (1400kg/m<sup>3</sup>) with 20mm render, tied with stainless steel wall ties across a nominal 50mm clear cavity through breather membrane and sheathing board to minimum 89mm x 38mm timber studs at max 600mm centres. 90mm<sup>6</sup> Isover Timber Frame Roll in stud cavity with internal linings as below. 100% load ratio.



Cladding of 103mm facing brick tied with stainless steel wall ties across a nominal 50mm clear cavity through breather membrane and sheathing board to minimum 89mm x 38mm timber studs at max 600mm centres. 90mm<sup>6</sup> Isover Timber Frame Roll in stud cavity with internal linings as below. 100% load ratio.



Cladding<sup>2</sup> comprising vertical tile hanging on treated 25mm timber battens fixed through breather membrane and plywood sheathing board to minimum 89mm x 38mm timber studs at max 600mm centres. 90mm<sup>6</sup> Isover Timber Frame Roll in stud cavity with internal linings as below. 100% load ratio.

Detail	Board type <sup>3</sup>	Fire <sup>4, 5</sup> resistance mins	Estimated laboratory sound insulation 100 - 3150Hz, R <sub>w</sub> dB	Performance substantiation report
1	One layer of 12.5mm Gyproc WallBoard DUPLEX	30	50 - 55	A066001
2	One layer of 12.5mm Gyproc WallBoard DUPLEX	30	50 - 55	A066002
3	One layer of 12.5mm Gyproc WallBoard DUPLEX	30	40 - 45	A066003
1	Inner layer of 12.5mm Gyproc WallBoard and outer (face) layer of 12.5mm Gyproc WallBoard DUPLEX	60	50 - 55	A066007
2	Inner layer of 12.5mm Gyproc WallBoard and outer (face) layer of 12.5mm Gyproc WallBoard DUPLEX	60	50 - 55	A066008
3	Inner layer of 12.5mm Gyproc WallBoard and outer (face) layer of 12.5mm Gyproc WallBoard DUPLEX	60	40 - 45	A066009

<sup>1</sup> The fire resistances quoted are for loadbearing walls tested with fire exposure to the internal face. Performances are for walls incorporating tapered edge boards with all joints taped and filled according to Gypsum Industries' recommendations. The quoted performances are achieved only if Gypsum Industries' components are used throughout, and the Company's fixing recommendations are strictly observed. Any variations in the specifications should be checked with Gypsum Industries. All tests were carried out with boards nailed-fixed. Screw-fixing is an acceptable alternative and minimises the risk of fixing defects.

<sup>2</sup> Other lightweight claddings, such as timber sidings, cementitious render etc., can be used and will offer the same performance.

<sup>3</sup> If standard Gyproc WallBoard is used in place of DUPLEX, a vapour control layer will be required directly behind the plasterboard, fixed to the face of the timber frame.

<sup>4</sup> The fire resistance performances quoted are independent of any contribution from the external construction, but do include the sheathing board.

<sup>5</sup> Board joints must be reinforced with Gyproc Paper Joint Tape for the quoted fire resistance periods to be achieved. Please refer to section 2.2 for full details.

<sup>6</sup> Consideration needs to be given to the use of 140mm Isover Metac Roll to achieve required thermal performance for an external wall.

**PERFORMANCE****Environmental**

Gyproc plasterboard linings to timber frame external walls are unsuitable for use in areas subject to continuously damp or humid conditions.

Plasterboards are not suitable for use in temperatures above 49°C but can be subjected to freezing conditions without risk of damage.

**Fire protection**

For reaction to fire classifications for Gyproc and Glasroc boards please refer to **Section 2.1**.

**Fire resistance**

The fire resistances given in **Table 2** are taken from BRE 1988 guidelines document for imperforate walls tested to *BS 476: Part 8: 1972*, or *BS 476: Parts 21 and 22: 1987*, or assessments based on these tests.

**Sound insulation**

The  $R_w$  ratings given in **Table 2** are estimates for imperforate constructions and if tested in accordance with *BS EN ISO 140-3: 1995*, and rated in accordance with *BS EN ISO 717-1: 1997*.

Airtightness is essential for optimum sound insulation. While most junctions will be sealed by standard jointing materials, gaps at the base of the partition or lining, at the perimeter of the floor / ceiling, and other small airpaths, can be sealed using Gyproc Sealant.

The laboratory sound insulation data quoted was measured in the absence of flanking transmission. The actual performance of the building element will generally be governed by flanking transmission.

**Water vapour control**

Where there is a requirement for a vapour control layer, DUPLEX grade boards should be specified as the face layer (i.e. the outer layer in double layer linings). The application of two coats of Gyproc Drywall Sealer to the face lining will also provide vapour control.

**Thermal properties**

Isover insulation is positioned between joists or wall studs to provide the required level of thermal insulation.

**DESIGN****Planning – key factors**

To minimise the risk of cracking at the plasterboard joints, seasoned timber with a moisture content not exceeding that recommended in *BS 5268: Part 2: 2002* should be used. The contractor should ensure that timber supports are accurately spaced, aligned, and levelled. When designing timber frame buildings, the designer should take account of all available relevant Standards, Documents, and associated literature.

**Cavity barriers**

Cavity barriers may be required to satisfy the requirements of national Building Regulations. A Isover Cavity Barrier may be required to seal the cavity between the outer brick wall and the internal timber frame leaf. Please refer to **Section 3.9**.

**Service penetrations**

Penetrations of fire resistant constructions for services, such as vent pipes and flues, need careful consideration to ensure that the fire integrity of the wall 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 which 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 substantial fire-stopping system.

In most situations the services will be installed by contractors other than the dry lining 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.

**Strength and robustness**

The dimensions and assembly of timber supports should be sufficient to allow positive fixing of plasterboard without bounce or undue deflection because of the nailing, screwing, or other applied force.

Where boards are fixed at maximum centres in adverse conditions the standard of lining can be affected. Adverse conditions can generally be described as conditions where high humidity occurs, principally in the cold, damp, autumn/winter period. They also refer to buildings under construction over this period where both the structure and wet applications such as plastering and screeding are subject to slow drying conditions.

**Partition junctions**

Where partition junctions occur, additional studs can be specified within the factory-produced wall panels, and can be incorporated either during manufacture or on-site. Alternatively, a suitable ladder frame can be installed between vertical studs during site construction, with horizontal members at 600mm centres.

**Fixing to timber frames**

A Technical Information Sheet is available from the Technical Sales Department.

**Nail popping**

Loosening of nails in timber can occur through timber shrinkage, or as a result of fixing boards to misaligned or twisted framing. To minimise the risk of fixing defects, fix boards tight to framing members and use Gyproc Drywall Timber Screws.

**Vapour control**

A vapour control layer is typically required. The required vapour control layer (whether using Gyproc Wallboard or polyethylene film) will be governed by the form of construction and the degree of thermal insulation provided.

**Wall ties**

The brick or blockwork external cladding is connected to the structural timber frame using flexible wall ties. These are designed to accommodate post-construction shrinkage of the timber.

**Sheathing board**

A plywood or other suitable wood-based sheet material is nailed to the timber frame at predetermined centres. By providing resistance to wind loads, it strengthens the panel and gives the building the required stiffness and strength. Plasterboard also contributes to the racking resistance of timber frames in accordance with *BS 5268: section 6.1: 1996*.

**Breather membrane**

A suitable membrane is applied to the outer face of the sheathing board. The breather membrane keeps rain out of the structure during construction, but allows the wall to breathe.

**Cavity requirement**

A nominal 50mm clear cavity must be maintained to isolate masonry claddings from the timber frame. This minimises the risk of damage due to driven rain penetrating to the interior and resulting dampness inside the building.

**Installation of services**

Electrical and other small service runs can be routed within the timber stud cavity.

The installation of services should be carried out in accordance with all available standards, guidelines and recommendations.

**Fixtures**

For heavy fixtures such as cisterns, radiators, or wash basins, screw fixings can be made directly into the timber supports. Additional studs or timber noggings should be installed as appropriate. For medium to light fixtures suitable proprietary plasterboard fixing devices can be used.

**Ceramic tiling**

Ceramic tiles up to 12.5mm thick with a maximum weight of 32kg/m<sup>2</sup> can be applied using thin-bed adhesives (usually 3mm thick). Stud support centres should be closed down to 400mm, or alternatively, timber noggings (50mm x 38mm) should be installed horizontally between studs at 600mm centres within the area to be tiled. Gyproc Moisture Resistant board should be specified as the lining. For small areas such as splashbacks, however, standard wallboard can be used, provided that the surface is protected by applying two coats of Gyproc Drywall Sealer prior to tiling. Please refer to **section 2.3** for more information.

**Board finishing**

Refer to **section 1.5** - Finishing Coat Plasters, **section 2.2** - Jointing, and **section 2.5** - Decorative effects.

**INSTALLATION****General**

It is important to observe appropriate Health and Safety legislation when working on site, i.e. protective clothing and equipment, etc.

The following notes are intended as general guidance only, depicting the basic sequence of installation. In practice, consideration must be given to design criteria requiring specific project solutions. Contact the Technical Sales Department for guidance.

Installation should be carried out in accordance with all available legislation, standards, guidelines and regulations.

**Erecting the timber frame**

1. Install factory produced timber wall panels of the required dimensions to form the structural building frame. Additional framing members are normally incorporated into wall units during factory construction, in the required positions, to accommodate door/window openings, adjoining partitions, etc.
2. Install any additional framing as required to support heavy fixtures.
3. Install sheathing board and breather membrane as specified.
4. Locate electrical and other services within the stud cavity. Install timber noggings to support recessed switch boxes/socket outlets.

**Erecting the insulation and lining**

1. Locate Isover insulation in the stud cavity.

**Board fixing – single layer**

2. Fix boards to all framing members at 300mm centres using Gyproc Drywall Timber Screws, or 150mm centres using Gyproc Nails.
3. Reduce screw fixing centres to 200mm at external angles.
4. Lightly butt boards, inserting fixings not closer than 10mm from bound board edges and 13mm from cut edges.

**Board fixing – double layer**

5. Under-layer boards do not require centre fixings. Cut and fix the initial second layer board as appropriate so that subsequent board joints are staggered.

**Note:** The length of fixing must be sufficient to provide adequate penetration into the timber support. Refer to **Table 3** for the recommended minimum lengths of fixings.

6. Seal any gaps around the perimeter of linings with Gyproc Sealant (in conjunction with Gyproc Joint Filler at the base of the lining). This restricts air movement and allows thermal and sound performance requirements to be achieved.

**Note:** Gyproc plasterboard linings can be fixed as soon as the building envelope is sealed, which may be prior to installing the external cladding, i.e. brickwork.

**Table 3 Fixing plasterboard to timber supports**

Board thickness (mm)	Gyproc Drywall Timber Screws (mm)	Gyproc Nails (mm)
12.5	38	40
12.5 over 12.5	51	50