





Ceilings



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Introduction

Gyproc offers a full range of specifications from simple plasterboard ceilings through to a range of high performance acoustic and fire rated suspended ceilings and lay-in grid systems.

They cover all building categories, including residential, apartments, healthcare, educational facilities, recreational and industrial properties in both new-build and refurbishment and can satisfy the most demanding performance requirements.

When specifying ceiling solutions, a number of performance characteristics are normally used to determine the required solution. Depending on the project or construction type, these performance parameters could be set by minimum regulatory standards, or a client or customer requirements at levels achieving basic up to the highest standards of performance and comfort.

Good practice specification guidance

Gyproc's systems are designed and tested to meet every performance requirement and are fully supported by our SpecSure® system warranty.

This means that when our systems are installed following our guidance they will achieve every performance claim we make. To maximise the performance achieved on site, consider the following good practice specification guidance:

- Consider flanking transmission at the design stage and ensure construction detailing is specified 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
- 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
- When designing spaces requiring separation by sound insulating floors and ceilings that are abutting structural steelwork, consideration should be given to isolating the steelwork within cavity spaces, or where exposed, box out appropriately dependent on the required fire protection, to help reduce any transfer of structure borne sound

Design

Planning – key factors

Gyproc concealed grid ceiling systems offer a wide range of performance benefits and come in a number of different construction variations.

Gyproc MF ceiling system comprises Gypframe MF7 primary channels and MF5 secondary channels supported from vertical hangers taken from the soffit and is designed to take a range and number of Gyproc, Glasroc specialist, Gyptone and Rigitone plasterboards dependent on the performance requirements of the project. Gyproc MF ceiling system has a minimum cavity depth of 100mm.

Gyproc MF CURVE ceiling system is a variation of the standard MF ceiling system using the same components but demonstrates how the system can be formed for both concave and convex structures and matched with specialist boards such as Gyptone Curve boards to create an aesthetic feature and have good levels of sound absorption.

GypLyner UNIVERSAL ceiling system comprises Gypframe GL1 channels fixed back to the structure using Gypframe GLB85 / 135 brackets. This system provides a much smaller cavity depth of minimum 25mm up to 135mm and is useful when space is limited.

Cavity barriers

Where cavity barriers are required, these can be formed using Gyproc FireStop, DuraLine, Habito or Glasroc X screw-fixed to a simple 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 concealed grid ceiling systems lined with Gyproc, Gyptone or Rigitone 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. For high humidity and high moisture conditions use Gyproc MR or M2TECH variants or Glasroc specialist boards.

Refer to Robustness for further information.

Vapour control

For areas other than where perforated Gyptone or Rigitone boards are used, the application of two coats of a vapour control sealer (by others) to Gyproc plasterboards after installation and jointing should provide a water vapour resistance of at least 15MNs/g. Alternatively using an appropriate vapour control layer such as a polythene membrane, prior to installing the plasterboard lining will significantly reduce the risk of interstitial condensation.

Acoustic performance

Gyptone and Rigitone 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 ISOVER Eco APR over the back of the

ceiling. Where sound insulation from room-to-room is required, sound attenuation $D_{n,c,w}$ of 39dB can be achieved by the inclusion of 100mm ISOVER Eco APR over the back of the ceiling lining board. Alternatively, other design considerations should be adopted such as extending adjoining partitions into the plenum void, installing a plenum barrier or lining the ceiling with two or more layers of Gyproc SoundBloc dependent on the specification of the separating partition. For further guidance, please contact the Gyproc Technical Team.

Thermal performance

ISOVER insulation can be laid over the suspension grid to provide the required standard of thermal insulation. For further guidance, please contact the Gyproc Technical Team.

Imposed loads

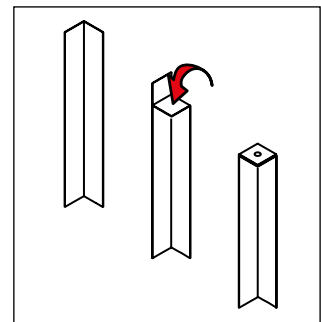
Table 2 in the Gyproc MF Ceiling section provides loading data for the suspension grid for Gyproc and Glasroc specialist boards. The data is based upon Gypframe MF5's installed at 400mm centres. Maximum loads will be reduced by 20% when Gypframe GA1 Steel Angle is fixed directly to the soffit (modified loads are shown in brackets) but must only be used in non-fire rated constructions. The layout of the Gypframe framework described in the Gyptone and Rigitone acoustic ceiling sections are designed for single boarded applications only. **Table 3** in the Gyproc MF Fire Performance Ceiling section provides loading data for the suspension grid and is based upon higher gauge Gypframe components with Gypframe MF5's installed at 400mm centres. For further guidance, please contact the Gyproc Technical Team.

Suspension – Gyproc, Glasroc specialist & Gyptone board linings

Fixing points for suspending Gyproc MF ceiling system for the most common single boarded solutions are required at 1200mm centres in each direction. It is important that the correct fixing method is used to secure the hangers to the structural soffit. For normal concrete soffits, Gyproc Wedge Anchors should be used.



Suitably fix Gypframe GA1 hangers to soffit using Gypframe Soffit Cleat with Nut & Bolt.



Alternatively, Gypframe GA1 Steel Angle can be cut, bent and drilled to facilitate direct fixing to the structure (maximum loads will be reduced by 20% if using this method).

NB For double layer ceiling please refer the Table 3 and 4 on page 258

Design (continued)

The ceiling grid is suspended from a concrete soffit using Gypframe Soffit Cleats and Gypframe GA1 Steel Angles to provide a robust suspension support which restricts any flexing of the lining when pressure is applied from below.

Gypframe GA1 hangers can also be fixed direct to the soffit. The angle should be cut along the spine with both flanges bent over. However, this will reduce the maximum loads that the grid is capable of supporting by 20%. Fixing Gypframe GA1 hangers direct is also not suitable if the ceiling is likely to deflect due to varying pressures and is not suitable for fixing to a sloping substrate.

GypLyner UNIVERSAL CEILING system uses two lengths of bracket to suspend the main runners, Gypframe GL1 Channels. The GLB85 gives a minimum cavity depth of 25mm up to 85mm, and the GLB135 from 25mm up to 135mm allowing sufficient adjustment for levelling the ceiling.

Suspension – Rigitone board linings

Gyproc MF ceiling system - Gypframe MF7 Primary Support Channels are fixed at 1000mm centres. Fixing points to the structure for the Gypframe MF7 Primary Support Channels are required at 900mm centres. In addition to this, the Gypframe MF5 Ceiling Section should be installed at nominal 330mm centres. GypLyner UNIVERSAL CEILING system - Gypframe GLB brackets are installed at 1200mm centres with Gypframe GL1 Channels at nominal 330 centres.

Partition to suspended ceiling junction

GypWall metal stud partitions can be fixed to the underside of a Gyproc MF ceiling through to the framework, in accordance with Gyproc's installation instructions, noting that additional Gypframe MF5 Ceiling Sections may be required. The maximum permissible heights for partitions in this scenario are claimed exactly as they would be when fixed to a normal concrete or steel beam structural soffit.

It is important to consider the room to room performance achieved by the partition and to ensure that these performances, such as fire and acoustic performance are maintained when the partition is built to the underside of the Gyproc MF ceiling. Where this is not possible due to the specification of the ceiling, then the partition should be designed to be installed to the full height of the room up to the underside of structural soffit. For further guidance, please contact the Gyproc Technical Team.

In situations where a Gyproc MF ceiling abuts and is fixed to the side of a GypWall partition, the ceiling will provide lateral restraint. Assuming that this Gyproc MF ceiling system is suitably fixed to a structural element / full height partition to the opposing side and there are no level changes or special designs such as large openings that would weaken this ceiling system, then this lateral restraint can be considered when developing the partition specification in terms of maximum heights.

The relevant maximum height of the partition therefore, 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 and either the ceiling framing should be in place at the time of installation or temporary restraint should be used. For further guidance, please contact the Gyproc Technical Team.

Services

The position of services, access panels and heavy fixtures should be pre-determined and their installation planned into the frame erection stage. The plenum can be used to route all service requirements including ducting, pipework, electrical cables and conduit. All services should be independently supported from the building structure. Where light weight 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 **Table 2** in the Gyproc MF Ceiling section and **Table 3** in the Gyproc MF Fire Performance Ceiling section for maximum recommended loads.

Access for maintenance

Gyproc, Gyptone or Rigitone Access Panels can be used to provide access for maintenance.

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 heavier fixtures, refer to **Table 2** in the Gyproc MF Ceiling section and **Table 3** in the Gyproc MF Fire Performance Ceiling section. Where loads outside this range are anticipated, independent suspension should be provided from the structure.

Where it is not possible to predetermine the exact location of fixtures hanging from a ceiling, or where additional fixtures may be added or moved around the area in the future, Gyproc Habito board should be considered as the ceiling lining board where medium and / or heavy weight fixtures are to be included. Gyproc Habito board has a screw pull-out safe working load (SWL) of 30kg per screw. Refer to GypWall HABITO on page 118 for further information.

Control joints

Control joints (by others) 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.

Rigitone expansion joints

Rigitone boards should be cut 10mm short of the perimeter wall and should not be fixed to the perimeter channel. Refer to construction details 1 and 2.

Design (continued)

Rigitone Board Layout

Install the first board in the centre of the room. Use an alignment line or preferably a fixed edge guide to ensure the board is properly aligned before screwing it into place.

Work outwards from the centre of the room in a star pattern when installing subsequent boards, making sure that they are all laid in the same direction (see markings on the ends and lettering on the long edges of the boards).

Boards should be stored in the room/space where they will be installed for at least 24 hours prior to installation to allow conditioning of the boards.

Jointing - Rigitone boards

Use appropriate aids to ensure the boards are properly aligned and check the alignment before screwing them into place along the perforation rows (straight and diagonal). Fill the joints generously and completely so that the filler just starts to exude from the reverse of the board. Slightly overfill the screw heads using the Rigitone screw head template. Once the Rigitone Mix 600ml has begun to harden, remove any excess carefully using the Rigitone scraper and then pass the scraper back over the joints in the other direction to smooth the surface. The joints and covered screw heads can be sanded after 24 hours. Further finishing work may be continued once the Rigitone Mix 600ml has fully dried.

Board finishing

Additional care and attention should be exercised when jointing Gyptone and Rigitone boards so as not to fill the perforations and impair the acoustic performance of the finished ceiling. Refer to Finishing systems.

Mold & moisture protection

Where additional protection against moisture is required, for example in a bathroom, kitchen or other area subject to intermittent humidity, then the moisture resistant grade of the required board type should be specified – for example Gyproc SoundBloc MR. Similarly, if protection against mold spores forming is required then M2TECH (mold & moisture technology) versions of the boards should be specified – for example Gyproc SoundBloc M2TECH.

Using MR or M2TECH versions of any of the plasterboard linings listed in the performance tables, will not affect the fire, acoustic, height or robustness performances listed.

Air quality

Consideration should be given to specifying plasterboard linings that, in addition to the performances listed in the preceding tables in the following ceiling sections (covering fire, acoustic, duty rating etc), actively absorb harmful volatile organic compounds (VOC's) such as formaldehyde, from the atmosphere. Where additional protection against VOC's is required, then Activ'Air versions of the boards listed in these pages should be specified – for example Gyproc SoundBloc Activ'Air.

All Gyptone and Rigitone boards come with Activ'Air technology.

Using Activ'Air versions of any of the plasterboard linings listed in the performance tables, will not affect the fire or acoustic performances listed.

Construction details

For Gyproc ceiling construction details, refer to the construction details shown at the end of each ceiling section. For more typical or example details, please contact the Gyproc Technical Team.