



Specifying Plasterboard

An Introductory Guide to Gyprock Wall and
Ceiling Systems for Commercial Buildings



“Manufacturers can vary the plaster recipe or sandwiching material to enhance the board’s performance properties, including fire resistance, water resistance and acoustic performance.”



INTRODUCTION

Since its introduction to the Australian market in the 1940s, plasterboard has become one of the most enduring building products used in both residential and commercial buildings. An effective choice for wall and ceiling systems, plasterboard offers several advantages to architects, designers and specifiers, including affordability, versatility and relatively low environmental impact.

However, over time, building design and performance requirements have grown in complexity and a one-size-fits all plasterboard solution is no longer viable. Requirements for fire resistance, condensation control, thermal comfort, structural design and acoustics are in a state of constant flux, often becoming more stringent under each new iteration of the National Construction Code (NCC) and the related Australian standards.

The task of juggling a myriad of performance requirements and the complex relationships between different building elements and materials is often filled with frustration and confusion. Over an entire building structure, the complexity compounds exponentially, sometimes forcing architects, designers and specifiers to depart from their original vision.

Fortunately, today's manufacturers and suppliers of plasterboard in Australia not only offer a range of tailored products to meet the needs of almost any application, but also the depth of product knowledge to help you deliver high-performing, compliant and beautiful building solutions.

In this whitepaper, we take you on the first step of this journey, providing an introductory guide to specifying Gyprock plasterboard and how you can bring it all together with the assistance of an ecosystem of tools and resources from one of the leading manufacturers in the plasterboard industry.



Over time, building design and performance requirements have grown in complexity and a one-size-fits all plasterboard solution is no longer viable.

WHAT IS GYPROCK?

Gyprock is a brand name for plasterboard, which may also be referred to as gypsum board, or drywall. Gyprock panels are comprised of a layer of gypsum plaster sandwiched between a facer and backer material, typically heavy-duty liner paper. When the gypsum sets, it results in the solid panel that has become popular in the design and construction industry.

The core of a Gyprock panel is made by mixing gypsum, a naturally occurring, non-toxic sedimentary rock, with a foaming agent to create a wet plaster mix. The plaster is applied onto a sheet of thick paper and the side

edges of the paper are wrapped around the plaster. A sheet of linerboard paper is applied over the top, after which the resulting plaster sandwich is cut to length and oven dried.

Plasterboard rose to popularity as a time and labor-saving alternative to traditional methods of finishing internal walls and ceilings. Installing plasterboard is relatively simple and effective, and can be done quickly and at relatively low cost. Plasterboard also helps builders and designers meet building regulations for fire protection, acoustic insulation and thermal efficiency.

APPLICATIONS

Gyprock is commonly used as an internal lining board to provide smooth, strong and longlasting walls and ceilings. It has a durable surface that provides the ideal substrate for different types of finishing, including paint, wallpaper, texture compound and tiles. Recessed edges make it possible to achieve a smooth, even and continuous surface once jointed.

Manufacturers can vary the plaster recipe or sandwiching material to enhance the board's performance properties. Specific solutions in the Gyprock range offer increased impact resistance and durability for high-traffic commercial environments. Other solutions provide high-performance fire and acoustic rated walls and ceilings. Mould resistance is also available in some Gyprock boards to

provide an extra layer of protection. To meet the growing demand for sustainability, 'greener' options are also available, which feature higher levels of recycled content.

Gyprock comes in other formats beyond the standard plasterboard sheet. For example, Gyprock ceiling tiles, which can be used for exposed ceiling grid systems. Gyprock cornices are available that provide an attractive finish at the junction of the wall and ceiling. Where the application calls for curved walls and ceilings, flexible Gyprock boards with an enhanced core that allows bending to small radii can be used. Decorative ranges such as Gyprock Rigitone and Gyptone combine striking aesthetics with practical qualities, such as high acoustic performance.

DESIGN AND INSTALLATION CONSIDERATIONS

Condensation control

The building envelope should include the appropriate methods and products, such as sarking and insulation, that ensure condensation is controlled within the building structure. Wall and ceiling systems should include vapour barriers to vent the flow of water vapour from the warm to the cool regions. For ceilings, unheated roof spaces should be adequately ventilated. Moisture-laden rooms should be exhausted to the outside, rather than into the roof or floor space. If left unpainted or sealed, some plasterboards can be vulnerable to surface mould attack in some environments.

Structural design

All wall and ceiling systems should be designed to withstand the appropriate loads. The manufacturer should be consulted when selecting wall framing elements and for plasterboard linings to ensure they meet structural requirements. The height of the wall, types of fasteners used, clearances and other details all contribute to a system's overall structural performance.

Note that different types of walls, for example non-loadbearing and loadbearing loads, are subject to different structural requirements. For more detail, refer to the structural performance requirements in Section B "Structure" of the NCC.

Heating

Localised high temperature conditions equal to or above 52°C can make plasterboard brittle and crack. Features such as radiant heaters, halogen lighting, heat pumps, heating units, air conditioners and stoves should be selected and installed carefully to prevent temperature

rise and the risk of fire. Recessed lighting is a particular concern and should be installed in accordance with AS/NZS 3000:2018 "Electrical installations".

Services and Appliances

When installing services and appliances, care must be taken to protect the surrounding construction. For gas appliances, AS/NZS 5601 "Gas Installations" should be followed for commercial appliances.

Service penetrations through walls and ceilings may be required for electrical and data cables, switches, hydraulic pipes, vents and mechanical ducts. Note that fire and acoustic performance may be impacted due to such penetrations. Solutions such as fire and acoustic-rated switch boxes, sealants and other penetration devices may be used to maintain the wall or ceiling system's fire and acoustic rating.

Fixtures

Lightweight attachments, such as picture frames and clocks may be attached to the plasterboard so long as the fixings support the expected load. Heavier attachments, such as shelving and appliances, should be fixed through the plasterboard to the framing to reduce the risk of damaging the wall or ceiling. Fixings through fire-rated plasterboards may require special consideration.

Control joints

Movement caused by temperature and humidity fluctuation can stress internal linings and partitions, resulting in deformation and damage. To prevent this from occurring, Gyprock plasterboard should be isolated from structural elements using control joints.

FIRE RATING CONSIDERATIONS

In the NCC, the key fire performance requirements applying to internal wall and ceiling systems are found in Specification C1.1 “Fire-resisting construction” and Specification C1.10 “Fire Hazard Properties”.

Specification C1.1 specifies the minimum Fire Resistance Level (FRL) of internal walls. FRL refers to the graded ability of a building element to resist a fully developed flame for a certain period of time based on three criteria: structural adequacy, integrity and insulation. A building element’s FRL is determined under AS 1530.4:2014 “Fire-Resistance Tests for Construction” and expressed as 30-minute intervals under each criteria.

Under Specification C1.10, a wall or ceiling lining system must comply with the Group number specified in Table 3 in that clause. Group number refers to the number of one of four groups of materials used in the regulation of fire hazard properties and applied to materials used as a finish, surface, lining, or attachment to a wall or ceiling. The requirements of each Group number are determined by fire tests in accordance with AS 5637.1:2015 “Wall & Ceiling Fire Hazard Properties”.

Beyond the above provisions, there are several other NCC requirements that are applicable. For example, ceiling systems may be required to achieve a Resistance to the Incipient Spread of Fire, which refers to the ability of a ceiling to prevent the spread of fire and thermally insulate the space between the ceiling and the roof or floor above.

LEVELS OF FINISH

The type of finish applied to a wall or ceiling has a significant impact on the end result. AS/NZS 2589:2017 “Gypsum linings – Application and finishing” defines three Levels of Finish (3, 4 and 5) for plasterboard walls and ceilings for non-fire rated applications. Minimum specifications for each level are set out in the Standard, providing builders, installers and finishes with defined methods and practices to meet customer expectations.

Levels of Finish should be considered during the design stage, as there are specific tolerances for frame alignment as well as for plasterboard fixing and finishing. Factors such as the decoration finish, light type and direction, and location in the building determine the appropriate Level of Finish. In general, Level 3 is specified for areas that do not require any decoration; Level 4 is the standard level of finish for plasterboard lining when normal painting and decorating is planned; and Level 5 is selected when the desired outcome is to have a surface that is as free as possible from defects and visual blemishes.

ACOUSTIC CONSIDERATIONS

There is a growing body of evidence linking acoustic comfort with health and wellbeing, communication and productivity. The NCC enshrines this in Part F5 “Sound transmission and insulation”, which includes requirements to provide insulation against the transmission of airborne and impact generated sound through floors and walls sufficient to prevent illness or loss of amenity to the occupants.

The sound absorption, transmission and reflection characteristics of a space are greatly influenced by the properties of the selected systems, structure and lining materials. The Gyprock range addresses the increasing requirements for acoustic comfort in commercial settings with perforated plasterboard and access panels. When combined with fleece linings and insulation, the perforations reduce echo and noise reverberation.



BRINGING IT ALL TOGETHER

CSR Tools and Services

In the fast-paced world of architecture and design, each individual needs to be across every aspect of a build. However, as we have seen, even something as ubiquitous as plasterboard is subject to a wide range of regulations, standards and design considerations.

It is hard to be the expert of everything, so it is critical that as industry leaders CSR Gyprock offer an entire ecosystem of technical support to make the process smooth from specification through to the build. When you partner with CSR Gyprock you get more than just the board, you have access to the following tools, data and services:

- **CSR DesignLINK.** CSR DesignLINK is a team of professionals including engineers and building designers working to support the specification of CSR products in projects across Australia and New Zealand. With extensive knowledge of the building industry, DesignLINK partners with clients to workshop complex design issues, provide value engineering, rationalise system specifications and deliver better building performance while maintaining buildability for both builders and contractors.
- **Assistance with Major Projects.** CSR account managers are an extension of your business. They will work with your team and CSR DesignLINK to support major projects, delivering performance and simplification while ensuring compliance. When you work with CSR you can be assured that you receive the very best industry knowledge, combined with CSR DesignLINK's technical expertise.
- **System Performance Data.** As an industry leader, CSR takes responsibility to ensure compliance on its products and systems and supports it through extensive performance testing. Fire, thermal and acoustic reports are available for a wide variety of Red Book systems. Whether you are looking to prove performance or better understand the options available and what differentiates them, CSR teams' thorough understanding of performance requirements and results will have your query solved in no time.
- **CSR Connect.** CSR understands that in the construction industry, being with customers and onsite on projects can take up most of your workday. CSR Connect allows you to check stock availability, order CSR products, track deliveries, receive proof of deliveries and pay invoices online, 24/7.
- **NATA Accredited Laboratories.** CSR proudly owns NATA Accredited Testing Laboratories together with a Technical Workshop housing an extensive range of testing equipment. Access support for your projects, including compliant, customised systems and product innovations across all CSR solutions.

About Gyprock

A division of CSR, Gyprock is proudly an Australian made and owned, leading manufacturer of gypsum-based products such as plasterboard, plaster, cornices and associated finishing materials and accessories. Gyprock supplies a comprehensive range of high-performance products and systems for many applications to meet fire, acoustic and thermal requirements across all segments of the construction industry. Celebrating 75 years in the industry, Gyprock is a reliable manufacturer and supplier ensuring that in both commercial and residential segments, behind every great build is Gyprock.

All information provided correct as of September 2022

GYPROCK[®]

