The White Book Refurbishment Guide

Effective ways to repair, maintain and improve buildings.

British Gypsum
SAINT-GOBAIN

Welcome to the first edition of The **White Book** Refurbishment Guide.

Within this guide we have compiled an overview of the most effective ways to repair and maintain buildings, using our plasters, plasterboards, specialist boards and metal accessories.

We take our commitment to our customers seriously and as a result are focused on being the best building material supplier in the UK. This can only be achieved by delivering the highest level of customer satisfaction through quality solutions, that meet the needs of even the toughest performance requirements. Our **SpecSure®** lifetime warranted systems are there to provide peace of mind and confidence in the quality of our products.

The construction industry is evolving in response to changing regulations, greater focus on sustainable construction and value for money throughout the building's lifecycle. As the industry continues to develop, one thing remains a constant; you can rely on British Gypsum's expertise and product performance, whatever your needs, whatever your project.

Mike Chaldecott
Managing Director

Contents

For over a century, we've led the market in high performance internal building linings. We provide plastering, drylining and ceiling solutions that have shaped the spaces where people live, work, learn and play.

In every kind of building, we help to build ceilings, wall linings and partitions, provide thermal comfort, protect against fire, shield from impact and insulate against sound.

We work hard to achieve products that show we listen to our customers and understand their needs to drive our product and service innovations.

Today, we are part of Saint-Gobain, the world leader in the design, production and distribution of construction materials. We're a global business with more than 200,000 employees, serving markets in over 50 countries, and are uniquely placed to offer a whole interior fabric solution.

At British Gypsum we care passionately about the products and systems we produce and about the people we deal with.

Our range

We're the only UK manufacturer to offer the full range of internal lining solutions. They meet and exceed Building Regulations, for enhanced performance and prolonged building life.

Whether it's plaster-based or involves one of our many drylining wall and ceiling systems, you'll know it's the right solution for your situation.

Manufacturer of the Year 2013

Building Awards 2013 Winner

This award recognises the achievements made by British Gypsum over the past 12 months to place the customer at the heart of all business operations.

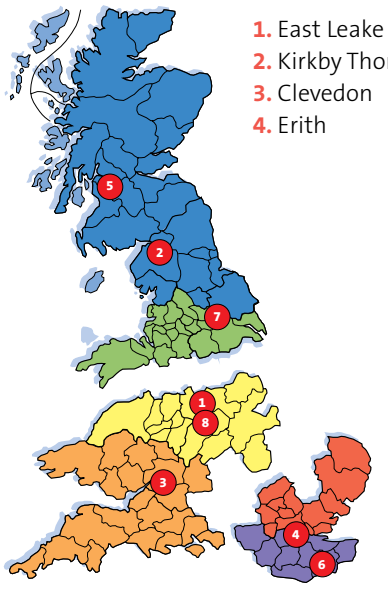
Plaster – Our world leading range of Thistle undercoat and finish plasters are unmatched for quality, consistency and on-the-wall performance. They provide the workability and high-quality finish preferred by plasterers and building owners throughout the United Kingdom.

Plasterboard – The flexibility of use for our solutions has established Gyproc plasterboard products as leader in the market. Our solutions help our customers meet the fire, thermal, acoustic, impact and lifetime performance demands of any building.

Specialist boards – Glasroc **F** and Rigidur **H** specialist boards offer a range of high performance benefits. They provide a basis for fire protection, thermal insulation and steel protection systems for a range of buildings.

Metal – Gypframe metal products provide the structural backbone of all British Gypsum systems. The range of metal studs, channels, angles, brackets and associated components are designed using the unique UltraSTEEL® process. It's the widest and highest quality range of metal system components in the industry.

Ceilings - Combining eye-catching design with stunning performance, our tiles, planks and boards provide total solutions for many buildings, from schools to offices and hospitals to residential developments.



1. East Leake
2. Kirkby Thore
3. Clevedon
4. Erith
5. South Lanarkshire College (Satellite)
6. Robertsbridge
7. Sherburn
8. Barrow-upon-Soar

Did you know?

We've built a business with five major UK manufacturing sites; four training centres; research, development and testing facilities that rank amongst the best in Europe; a technical support infrastructure that leads the industry and a network of 3500 stockists to ensure national product availability.

Using this guide

Different building types have different requirements. Within this guide are solutions to suit every project. It has been designed to make it quick, easy and simple to find the right solutions; whether you're wanting to repair, maintain or improve.

Depending on what type of building you're working on, you'll need a different type of solution. To help you quickly find which is best for you, we've split this guide into different sections, covering:

Private residential
Privately owned or privately rented housing.
Turn to page 10

Social residential
Registered Provider owned or managed housing.
Turn to page 20

Commercial
Commercial refurbishment projects
- Education
- Offices
- High-Rise Multi-Occupancy
- Retail
- Healthcare

Turn to page 34

For all our solutions please see The **WHITE** BOOK, which is available at:
www.british-gypsum.com
Alternatively if you have a specific query please contact our Technical Advice Centre on:
bgtechnical.enquiries@bpb.com

Solutions that will last a lifetime

Our plaster and drylining solutions have generations of experience and technical know-how built-in. We use only the highest quality components, developed and tested to work together to deliver specified performance. That's why we guarantee our systems with a unique **SpecSure®** lifetime system warranty.

SpecSure® is more than simply a performance warranty, it means the British Gypsum systems you specify:

- Have a guaranteed lifetime performance
- Have the technical expertise and experience of the UK's leading drywall specialist behind them
- Will be supported at every stage of the project by the UK's leading on and off-site technical support personnel
- Have been site tested to demonstrate installation integrity and simplicity
- Have been tested in UKAS-accredited fire, acoustic and structural test laboratories
- Will perform to published parameters throughout the life of each system
- Will be repaired or replaced by British Gypsum in the unlikely event of system failure attributed to unsatisfactory product / system performance, giving you total peace of mind.

Sustainable solutions

We ensure that our solutions don't just meet your needs today, but also meet all of our needs for tomorrow.

Sustainability is an important issue and we are keen to meet it head-on and make responsible decisions. The way we manage our business and care for our employees is as important to our future as the way we care for the environment.

Highlights

- First UK manufacturer to achieve zero plasterboard waste to landfill
- First UK manufacturer to gain ISO 14001 certification across all sites
- First UK gypsum manufacturer to achieve products certified 'Very good' to BES 6001 – Responsible Sourcing of Construction Products
- More than 55,000 hours employee and customer training last year
- Awarded 'Most Improved Safety Performance 2011' and 'Best Overall Safety Performance 2011' across all Saint-Gobain global businesses.

Social

Our people are our business. We ensure a safe, healthy workplace, give them respect and nurture their talents to take our business forward. We train for leadership and build employee knowledge through a ten-stage Technical Development Programme at our Saint-Gobain Technical Academy.

Economic

We work hard to ensure our business remains viable. We work closely with our supply chain to source materials responsibly and sustainably, driving issues such as Health and Safety and responsible business management throughout our supply base. Our responsible sourcing strategy means our plasters and UK manufactured plasterboards qualify for extra credits in leading environmental schemes.

Environmental

We were the first UK plaster and plasterboard company to gain ISO 14001 and use this standard for managing key areas, like compliance, energy management, water usage and waste reduction, across our business. We played a key role in developing the Ashdown Agreement; an initiative which is helping to reduce landfilled waste across the construction industry.

"For us, managing sustainably is not a new idea; it is how we've always done business and will underpin how we meet the challenges of the future."

BES 6001
Responsible Sourcing
www.greenbooklive.com

Did you know?

More than 150 of our trailers are now teardrop trailers and we're introducing even more measures in the future to reduce our carbon footprint.

Something to think about

By investing in our fleet, we have reduced emissions by 5% in the last 18 months.

01

Market sectors

Understanding your needs,
whatever the project, wherever the setting.

Private residential
Helping to make better homes.

Shaping spaces for living, with products that stand up to life.

Repair Maintain Improve

Turning houses into homes

Homes are required to perform at two levels. Firstly they need to provide shelter, comfort, warmth and an aesthetic quality. In conjunction with that, they need to be durable, energy efficient and safe.

Residential spaces are where people conduct the most personal parts of their lives. They are our chosen environment for children's birthday parties, a movie on the sofa and even reading a favourite book in the bath. It is vital that when damage occurs, it can be repaired in an effective, cost efficient and easy fashion.

Currently, there is a trend for applying the wartime mentality of 'make do and mend' to our homes. We are in the midst of an improvement revolution when it comes to private residential accommodation.

Converting out-buildings, adding extensions and creating rooms in our roofs is all part of modern residential culture. Our solutions make it easier than ever before to make those improvements, whilst maintaining high finished standards.

There are many elements to domestic renovation, but one that is often overlooked is the internal fabric of the house. This is in fact one of the more fundamental aspects when thinking about repairing, maintaining or improving homes to today's modern quality of living.

With an ageing housing stock, greater regulation around energy efficiency and carbon saving, and soaring fuel prices, it's no wonder that many of us are looking to make our homes warmer, more comfortable to live in and cheaper to run.

And in the current climate many of us are choosing to improve rather than move, be it carrying out essential repair to damaged walls, updating a bathroom or building extra space to accommodate our hectic and full lives.

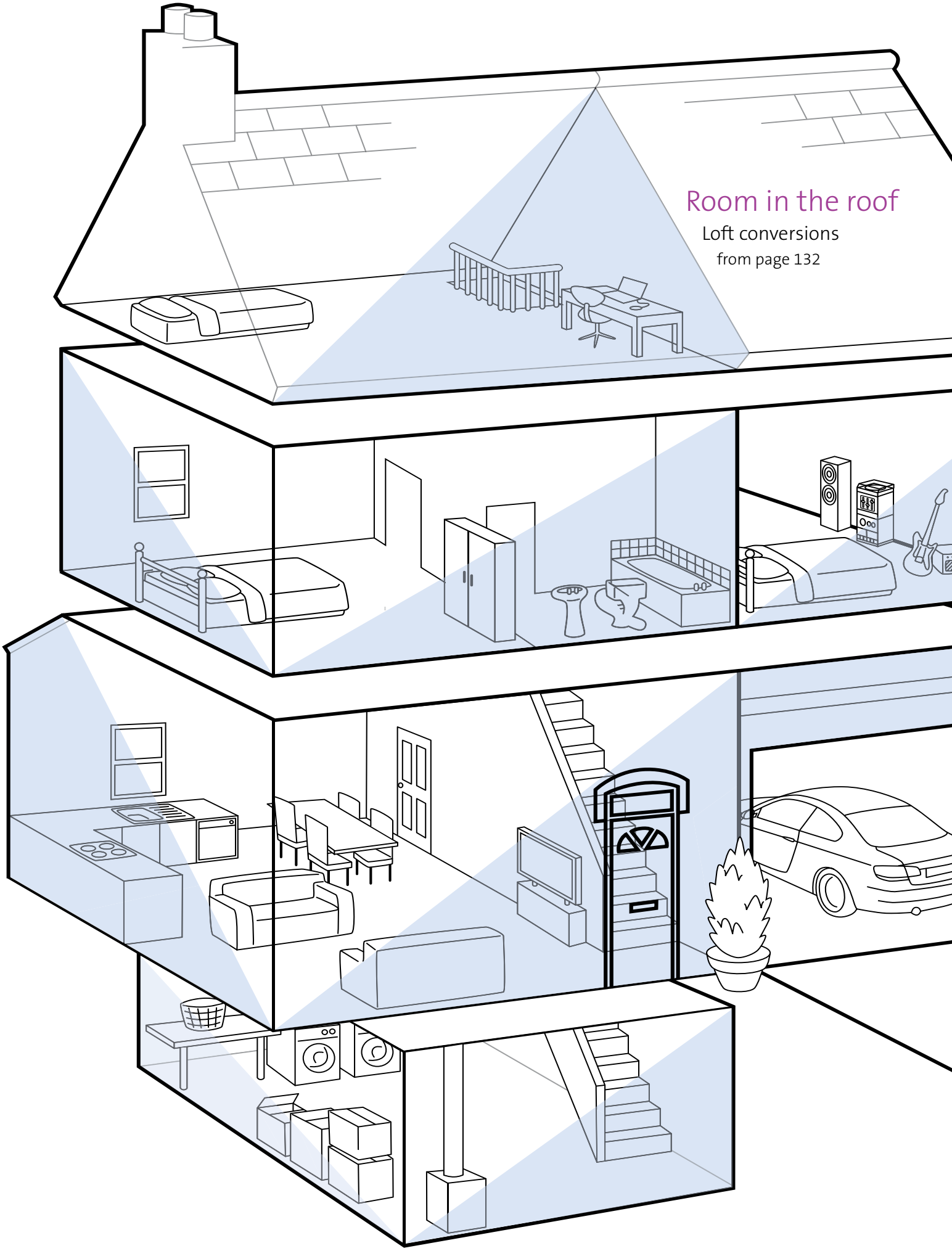
We provide a whole raft of internal lining solutions that can help make homes more thermally efficient, protected against impact, insulated against noise, resistant to moisture, resistant to vapour and safe from fire. Pages 12-15 provide information on solutions for all around the home.

Did you know?

Whilst refitting a kitchen or bathroom it's worth considering any future needs to upgrade the thermal performance of external walls.

A simple, contained and cost effective way of improving energy efficiency in the home is by using our Gyproc ThermaLine boards. We provide a comprehensive range of thermal laminate boards with varying thicknesses, offering different thermal resistances to suit existing build-ups.

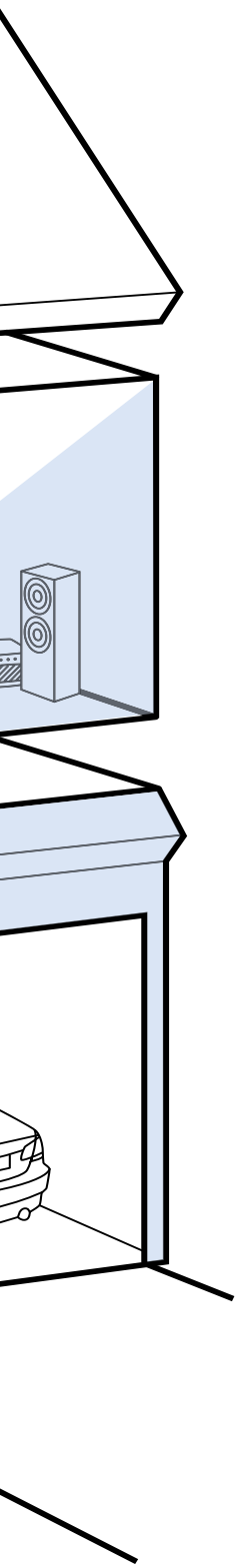
See page 122 for more information on thermal solutions.



Room in the roof

Loft conversions

from page 132



All round solutions all around the house

Sound insulation

Noisy neighbours
Internal walls and floors
from page 94

Moisture resistance

Bathrooms
Kitchens
from page 104

Fire resistance

Integral garage roofs
Loft conversions
from page 110

Vapour control

Bathrooms
Kitchens
Loft conversions
from page 104

Thermal insulation

Cold rooms
Exterior walls
Basements
Loft conversions
from page 122

Impact resistance

Stairways
Hallways
Garage walls
Damaged walls
from page 90

Indoor air quality

Living spaces
from page 152

Sound insulation

To minimise sound transferring through and around the home, there are a variety of different measures that can be taken, depending on where the noise is coming from and what type of sound is causing the problem. The noise that is generated and how it travels in a house will be different to that in the corridors of an apartment block, or even between flats. Sound will also carry and be bounced differently on internal partitions compared to the interior of external walls. Products like Gyproc SoundBloc, Gyproc TriLine, Gyproc DuraLine and Thistle plasters can provide excellent choices to combine with Gypframe components for acoustic performance.

Building Regulations Approved Document E gives guidance on what is a reasonable standard of sound insulation in the home, both between and within all residential dwellings. However, it is worth noting that these regulations are targeted for new build and conversions, but can be used as a guide for upgrading or installing sound/acoustic insulation in a residential building. If you are looking to replace entire walls, systems such as **GypWall CLASSIC**, **GypWall QUIET** or **GypWall QUIET IWL** and **GypWall QUIET SF** can all provide acoustic performance to building regulations standard. Refer to page 28 for the minimum sound performance standards in England and Wales (Approved Document E). Refer to Section 5 for Scotland.

Noisy neighbours

Noisy neighbours can be a nuisance; however this is a problem often caused by poor acoustic/sound insulation when the building was first constructed. However, systems such as **DriLyner RF** can reduce sound travelling between separating walls within an existing structure. See 'Acoustic Upgrades' from page 94 for details on these systems. Whether it's mid-range frequency (such as speech) or low-range frequency (such as surround sound systems), we can help block it out. Acoustic performance can be enhanced by using **DriLyner SI** or **RF** combined with Gyproc TriLine boards, for example. Alternatively, if your surface needs replacing and the background is blockwork or bricks, our Thistle two coat plaster system combines an undercoat plaster with a skim finish and could provide an excellent acoustic solution. For our full range of plasters, see the Plaster Selector Guide on pages 76 and 77.

Further information about reducing the travel of sound for extensions or new build projects within homes can be found in our HomeSpec 5 guide. It is available for free download from *www.british-gypsum.com/residential*

Moisture resistance

Bathrooms and kitchens need extra protection from moisture, which is generated through daily household activities. Particular attention should be paid to the surrounding areas of wet rooms, sinks, showers and baths, as the likelihood of walls getting damp is much higher. When upgrading a property's bathroom or kitchen areas, solutions like Glasroc H **TILEBACKER** can offer outstanding performance where there is frequent exposure to water. Other solutions such as Gyproc Moisture Resistant or any of our **MR** boards can also be used in areas that are subject to high levels of intermittent moisture.

Acoustic and moisture properties

Reducing noise transferring between rooms, particularly bedroom and bathroom walls, can help to make rooms feel more comfortable. When you want to improve both the acoustic and moisture resistant qualities in a partition wall – for example, a bathroom adjacent to a bedroom – there is also a requirement to reduce potential noise transferring through the walls and protect the wall from moisture. Our acoustic boards are also available with moisture resistant performance. SoundBloc **MR** would be perfect for this job. See page 106 for details about our range of **MR** boards.

Vapour control

Hot washing-up water, boiling kettles, baths, showers and cooking can create moisture vapour in the air. If a barrier is not put in place, the moisture can travel through ceilings and hit colder air. This vapour then condenses to form on the opposite side of the ceiling in the roof or loft space, which can lead to dampness and deterioration. Gyproc **DUPLEX** boards can serve as the ideal solution to this problem and therefore stop potential for rot and erosion to internal structures. For more information about the range of vapour control systems and boards, go to page 106.

Fire resistance

When it comes to fire prevention measures, the essential factor to consider is giving occupants more time to escape if a fire were to break out. This means that you want the walls, floors and ceilings to hold the fire at bay for longer. Both Gyproc DuraLine and Gyproc FireLine offer excellent fire resistance, more information on these boards can be found from page 118. These boards can then be combined with a skim finish, using a choice of Thistle Board Finish, Multi-Finish or, to add impact/damage resistance Durafinish. If the project spans over a number of rooms or homes then Thistle Spray Finish could also offer the answer. See the Plaster Selector Guide for the ideal finish plaster for your project. Building Regulations Approved Document B (Section 2 – Scotland) gives practical guidance for the purposes of fire safety in residential buildings. The regulations specify minimum periods of fire resistance required by different building elements. These periods vary according to the use and size of the dwelling.

It is worth keeping in mind that the greater the fire hazard, then the greater the period of fire resistance needed to protect the elements within

the building. The materials used for walls and ceilings are also controlled to reduce the risk of fire growth and internal fire spread.

Further information can be found in our **FIRE** BOOK, available for free download from *www.british-gypsum.com/literature/fire_book.aspx*

Thermal insulation

One of the key considerations in renovating a property is how to make it more energy efficient, reducing fuel bills and making the rooms more comfortable to live in. Cold houses or rooms can be a sign of inefficient insulation. If you are converting a blockwork or brick-built outhouse into an additional room, or refining the efficiency of an older property, you will need to improve its retention of heat. Gyproc ThermaLine **PIR** can provide the solution in the form of lining the interior of the external wall, dramatically increasing the overall thermal performance. Careful thought should go into improving the thermal insulation of walls and minimising air leakage at an early stage. Heating regimes and pattern of usage should also be considered when choosing an insulation solution.

Basements and cellars

Rooms beneath the ground can be tricky to treat, as moisture can enter through the surrounding ground, or condensation can form on the inside if the room has been tanked. Refer to page 29 for Elemental U-values for England and Wales. Refer to Section 6 for Scotland.

Further information can be found in 'Thermal solutions' on page 122 or in our **WHITE** BOOK, available for free download from *www.british-gypsum.com/literature/white_book.aspx*

Impact resistance

Areas such as stairs, hallways and landings are often knocked and damaged. They are also areas that are in frequent use and need to be robust enough to stand up to the test of everyday life. A combination of plasterboard and plaster, for example Gyproc DuraLine skim finished with Thistle Durafinish, can be the answer to helping prolong and maintain walls in areas that need to be tough against damage. If the background you are working with is blocks then two coat plaster could be the solution.

Building Regulation BS 5234: Part 2: 1992 – Partition Grading standard, provides guidance on several performance aspects relating to robustness, including impact resistance. All our partition systems have a duty rating established in accordance with the requirements of BS 5234 and achieve a minimum 'Medium' duty rating. This exceeds the 'Light' partition duty requirements outlined in BS 5234 for domestic accommodation.

Further information can be found in the impact /damage resistance section of solutions on page 90.

Indoor air quality

Though we don't notice them, impurities, such as volatile organic compounds (VOCs) are often present in the air we breathe - emitted from furniture, carpets and building materials. Long-term exposure to these can potentially cause health problems and reduce general wellbeing.

Clean air, on the other hand, can reduce the incidence of allergic reactions, reduce headaches, nausea and eye irritation.

ACTIV*air* is our latest technology designed specifically to convert formaldehyde, a common VOC, into non-harmful inert compounds, removing 70% of the formaldehyde concentration in the indoor air. This clever technology continues to work for over 50 years, and whilst alternative solutions absorb formaldehyde, they don't decompose like **ACTIV*air*** risking re-emission at a later date.

Did you know?

We have four BBA-certified internal wall insulations suitable for Green Deal.

Repair, maintain and improve

Depending on what type of work you're looking to carry out, you'll need different solutions to help you repair, maintain or improve the home.

Use this simple navigation tool to find what you need in this guide.

What work are you carrying out?

Repair
Solutions for repairing damaged walls, partitions and ceilings

Go to page 17

Maintain/upgrade
Solutions for the larger changes to your home, such as a new kitchen or updating the bathroom

Go to page 18

Improve
Larger renovations, such as changes to layouts, building fabric upgrades or extensions

Go to page 19

Water damage

The effects of water damage to homes can be devastating, so before carrying out any remedial work, turn to page 148 for all you need to know.

Repair

This flow chart provides an easy path to make the required repairs and identify potential solutions.

What are you intending to repair?

Wall or partition	Lining	Ceiling	Fire protection
Is it surface damage?	Is it surface damage?	Is it surface damage?	Is it surface damage?
No?	No?	No?	No?
Yes? Go to page 78	Yes? Go to page 78	Yes? Go to page 78	Yes? Go to page 78
Is it water damage?	Is it water damage?	Is it water damage?	Is it water damage?
No?	No?	No?	No?
Yes? Go to page 148	Yes? Go to page 148	Yes? Go to page 148	Yes? Go to page 148
Is it plasterboard on a frame?	Is it plasterboard on a frame?	Is it plasterboard on a frame?	Is it plasterboard on a frame?
No?	No?	No?	No?
Yes? Go to page 82	Yes? Go to page 82	Yes? Go to page 82	Yes? Go to page 82
Is it plaster?	Is it board stuck to masonry?	Is it tiles in a grid?	Board fixed to a board?
Go to page 70	No?	No?	Go to page 116
	Yes? Go to page 86	Yes? Go to page 140	
	Is it plaster?	Is it plaster?	
	Go to page 70	Go to page 70	

Did you know?

When repairing a home, speed, comfort and quality matter. A quick job that needs to be revisited is as bad as any job that is never finished. Once a repair has been made and a finished skim plaster applied, a first coat of breathable paint can be completed before the plaster has even finished drying.

Maintain/upgrade

Whether you're looking to update a single feature, upgrade a whole room or roll out a complete upgrade scheme, follow the chart below to help identify the correct solutions for your project.

What are you intending to maintain/upgrade?

		Wall or partition?	Lining?	Ceiling?	Fire protection?
	Thermal performance	Go to page 122 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 122 Consider **GypLyner IWL**	Go to page 122 Consider **CasoLine MF**	Go to page 122 Consider **GypLyner IWL**
	Vapour control	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Acoustic performance	Go to page 94 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 94 Consider timber joist floors and **CasoLine MF**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**
	Fire resistance (also see Fire stopping, page 118)	Go to page 110 Consider **GypWall CLASSIC**	Go to page 110 Consider **GypLyner IWL**	Go to page 110 Consider timber joist floors and **CasoLine MF**	Go to page 110 Consider **GypLyner IWL**
	Moisture resistance	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Impact resistance	Go to page 90 Consider Thistle plaster and **GypWall EXTREME**	Go to page 90 Consider Thistle plaster and **GypLyner IWL**	Go to page 90 Consider Thistle Durafinish	Go to page 90 Consider Thistle plaster and **GypLyner IWL**
	Aesthetic improvement	Go to page 128 Consider Thistle plaster	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 128 Consider Thistle plaster and **CasoLine MF**	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**
	Indoor air quality improvement	Go to page 152	Go to page 152	Go to page 152	Go to page 152

For the full range of Thistle plasters, see the Plaster Selector Guide on pages 76 and 77.

Improve

Helping you find solutions to renew existing spaces.

We produce specific sector guides to assist you in selecting solutions required for many types of work.

For residential buildings, please consider using HomeSpec 5, The **WHITE** BOOK Residential sector guide.

This guide will:

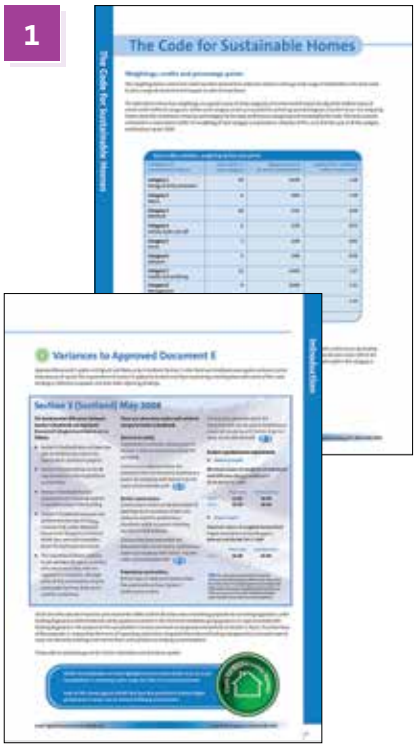
1 Explain the regulatory requirements, and how British Gypsum can help.

2 Identify and select solutions.

3 Provide support for common details and issues.

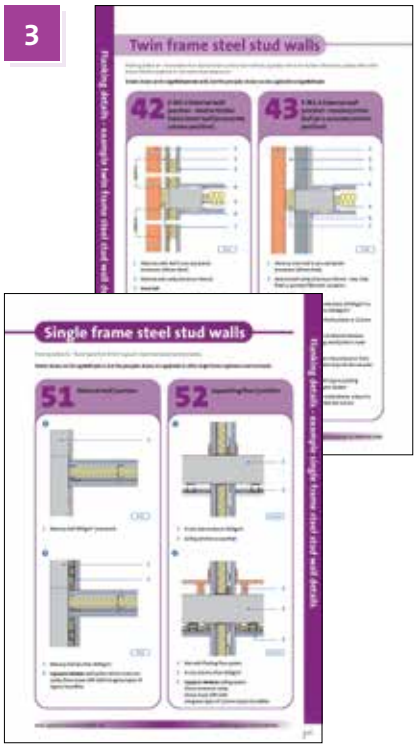
This document is available for free download from www. british-gypsum.com/residential

1



2

3



Social housing

Reducing maintenance cycles, maintaining resident satisfaction.

Robust, energy efficient and easy to maintain buildings, created with our continued support.

The Government is challenging the social housing sector to provide ever greater standards of comfort and energy efficiency for residents despite public funding cuts. Maintenance cycles need to be as long as possible.

The quality of existing social housing is being brought in line with private housing. Standards need to be achieved and then maintained on an ongoing basis. Opportunities for further improvements to the generally older housing stock exist, through Government initiatives such as Green Deal and the Energy Company Obligation (ECO).

Repair and maintenance on occupied housing must be carried out quickly and efficiently. It is important to use systems that provide long lasting performance with minimum disruption to residents. The turnaround time on void properties must be limited to serve the pressing demand for housing and reduce the duration of loss of income.

With a diverse range of residents, from young families through to the elderly, solutions must be designed to meet a wide range of needs.

Solutions must be robust to withstand heavy traffic, and minimise future repairs, particularly in high rise flats which have communal areas such as corridors and stairwells. They must also reduce noise and sound transferring between separating walls, especially when there are noisy neighbours around.

We provide a range of versatile internal lining solutions for repair, maintenance and improvement which will improve housing standards and reduce maintenance cycles. We work with Housing Associations, Local Authorities, Arms Length Management Organisations (ALMOs) and your contractors to improve the quality of housing stock for all property types.

Did you know?

Under Green Deal you should be able to continue using your contractors, as long as they gain Green Deal accreditation.

British Gypsum are an approved Green Deal Trainer, which means we can train your installers to the authorised standard.

Decent Homes and Decent Homes Backlog Programme

The Government's drive for all social housing to be at a minimum level continues through additional funding to deal with the backlog. Homes need to be in a reasonable state of repair, have reasonably modern facilities and services and a reasonable degree of thermal comfort.

Housing quality standards are in force in England, Scotland and Wales. Whilst the standards differ for England, Scotland and Wales, they are all designed with the same end goal in mind. For further information refer to:

England:
The Decent Homes and Decent Homes Backlog Programme
Scotland:
The Scottish Social Quality Standard
Wales:
The Welsh Quality Standard

We offer a range of solutions that can help you meet Decent Homes standard.

BREEAM

The ***BREEAM Domestic refurbishment scheme*** (BDR) provides a proven means of benchmarking your domestic refurbishment projects. It helps you, as a Registered Provider, to assess and monitor the sustainability performance of your stock and prioritise areas for maintenance and improvement.

Unlike its predecessor, EcoHomes, the BREEAM scheme has been designed specifically for the refurbishment market. It gives additional weight to key issues like management, health and wellbeing and energy. It also takes account of current regulations and policy, as well as finance schemes like the Green Deal.

The key areas covered include:

– Improving energy efficiency and reducing emissions

– Cutting waste and water usage

– Protecting homes from fire, flood and criminal damage

– Improving health of occupants and reducing fuel poverty.

The scheme applies to all buildings, from a single dwelling to a block of flats, and provides a useful measure to acknowledge progress made by quality providers.

Table 1: BREEAM Domestic refurbishment ratings

BREEAM Rating	Score required
Outstanding	≥ 85
Excellent	≥ 70
Very Good	≥ 55
Good	≥ 45
Pass	≥ 30
Unclassified	< 30

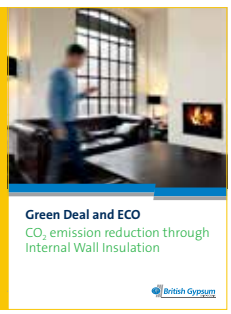
Sustainable refurbishment

Addressing sustainability at every stage of the repair and maintenance cycle will help to cut operating costs and increase the life of housing stock. It will also help to improve the comfort and health of residents and reduce fuel poverty.

We have extensive experience in sustainable development, gained working alongside architects, developers and colleagues from other Saint-Gobain companies. We use this knowledge to help you get the most from your refurbishment programmes.

Did you know?

British Gypsum offer a range of thermal laminate systems suitable for a range of properties including hard-to-treat homes. These are BBA certified solutions for Green Deal and ECO. They are a simple, contained and cost effective way of improving the insulation in the home.



Lifetime Homes

The Lifetime Homes standard recognises the changing needs of individuals and families at different stages of life. To qualify under the standard, new build and refurbishment properties must satisfy a range of 16 criteria designed to make the home adaptable to changes in personal and family needs.

The standard aims to make life's ups and downs easier to manage. It covers design and facilities that improve day-to-day living for expanding families and those coping with illness or reduced mobility in later life. For further information refer to: www.lifehomes.org.uk

Energy efficiency

It is estimated that at least 70% of the homes that will be around in 2050 have already been built. Many of these are solid brick wall and non-insulated properties with higher than average fuel costs.

The Government's target to reduce greenhouse gas emissions by 2050 imposes tougher energy standards for home refurbishments. To reach this target, funding schemes with energy companies and Registered Providers have come in the form of the Green Deal.

Green Deal

Under the Green Deal, homeowners will be able to make energy efficiency improvements at no upfront cost. The cost of improvements will be offset by future savings in energy bills, so the improvements will be cost neutral.

The Green Deal also applies to social and affordable housing residents. The person responsible for paying the electricity bill will make the repayment through their electricity bill. When the electricity bill payer changes (for example, because a new tenant moves in) the repayments will be transferred to the new bill payer.

The Green Deal will help Registered Providers make energy-saving improvements, such as insulation, to their social housing stock. This will keep homes comfortable for residents, with no cost implications.

What does the Green Deal do for Registered Providers?

- Provide a finance route to upgrade properties and improve social housing stock
- Open up further funding to fund the more expensive measures
- Provide more comfortable properties for residents
- Allow improvement works to be completed at the same time, as this may be more cost effective and less disruptive for residents
- Ensure the quality of work, as all work needs to be carried out through certified installers
- Support wider strategic priorities in areas like health and reduced poverty
- Help drive economic development through use of local suppliers.

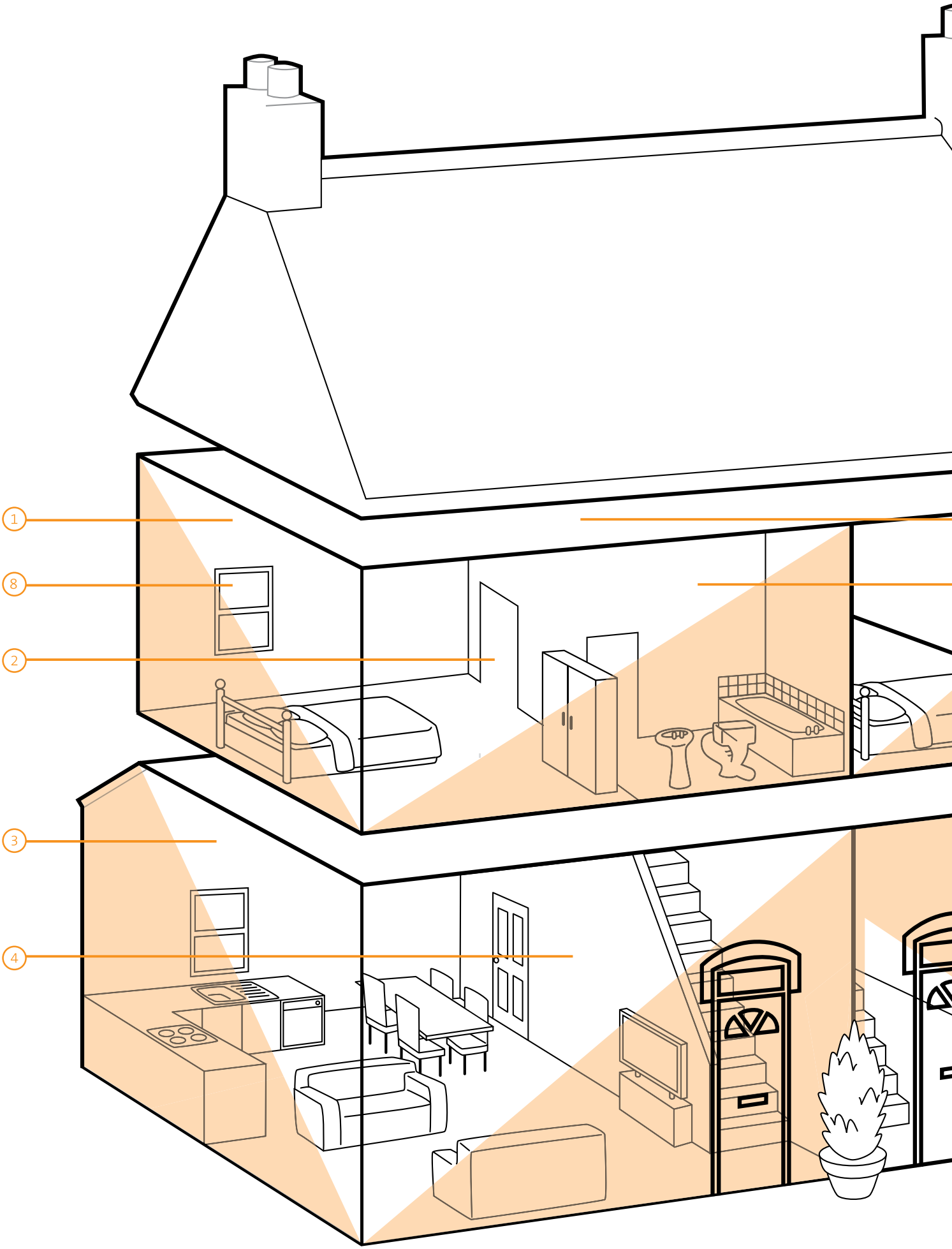
Energy Company Obligation (ECO) funding

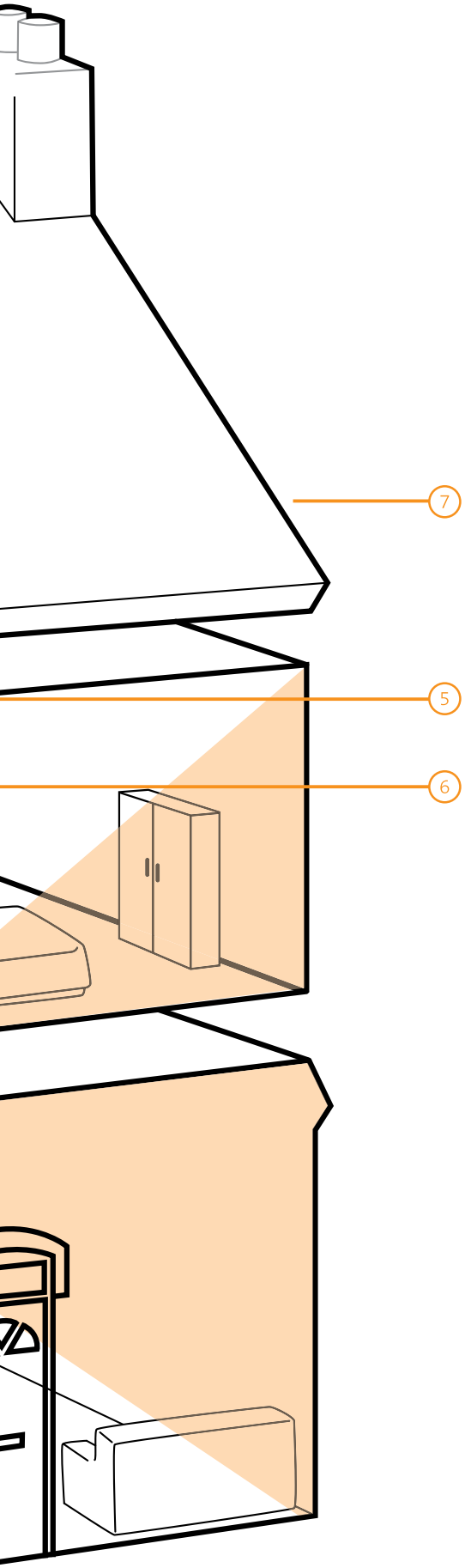
ECO is an obligation placed upon energy suppliers. It requires them to fund additional energy saving projects. The funding is designed to support rural communities, low income residents and properties with solid walls and hard to treat cavities.

Did you know?

Internal wall insulation (IWI) is a great way to improve the thermal efficiency of your housing stock. IWI is very adaptable and can be applied to all substrates and if required, it can also be combined with external wall insulation.

Find out more about British Gypsum's Green Deal and ECO approved Internal Wall Insulation systems by referring to our website.


1
8
2
3
4



What we do

Our range

We're the only UK manufacturer to offer a full range of internal lining solutions, providing a truly integrated approach.

Our solutions work together to give you the performance you need. Wall linings, partitions and ceilings – we've got them all covered. They meet and exceed Building Regulations for enhanced performance and prolonged building life.

We'll work alongside you and your contractors to pick the best solutions for your project. Whether they're plaster-based, or involve one of our many drylining systems, you'll know they're the right solutions for you.

What are you intending to maintain?	
	1 For insulating and lining external walls in one go Gyproc ThermaLine range
	2 For an extra tough finish in corridors, stairs and communal areas Thistle Durafinish
	3 For withstanding knocks and scrapes and reducing maintenance costs Thistle plaster range
	4 To cut noise transmission through walls Gyproc SoundBloc
	5 For a high quality lining for walls and ceilings and vapour control Gyproc WallBoard **DUPLEX**
	6 To prevent moisture damage in bathrooms and kitchens Glasroc H **TILEBACKER** range
	7 For enhanced fire protection in ceilings between properties Gyproc FireLine
ACTIV air	8 Designed specifically to convert formaldehyde emissions into non-harmful inert compounds

Impact resistance

Communal areas such as stairwells, halls and foyers are often knocked and damaged. They are also high footfall areas and need to be robust enough to stand up to the test of time and use. A combination of plasterboard and plaster, for example Gyproc DuraLine skim finished with Thistle Durafinish, can be the answer to helping prolong and maintain walls and ceilings in areas that need to be tough against damage. If the background you are working with is blocks, then two coat plaster could be the solution.

Building Regulation BS 5234: Part 2: 1992 – Partition Grading standard, provides guidance on several performance aspects relating to robustness, including impact resistance. All our partition systems have a duty rating established in accordance with the requirements of BS 5234 and achieve a minimum 'Medium' duty rating. This exceeds the 'Light' partition duty requirements outlined in BS 5234 for domestic accommodation.

Further information can be found in the 'Damage resistance' section of solutions on page 90.

Fire resistance

When it comes to fire prevention measures, the essential factor to plan around is giving occupants more time to escape if a fire were to break out. This means that you want the walls, floors and ceilings to hold the fire at bay for longer. Both Gyproc DuraLine and Gyproc FireLine offer excellent fire resistance. These boards can then be combined with a skim finish, using a choice of Thistle Board Finish, Thistle Multi-Finish or, to add damage resistance, Thistle Durafinish. If the project spans over a number of rooms or homes then Thistle Spray Finish could also offer the answer.

Building Regulations Approved Document B (Section 2 – Scotland) gives practical guidance for the purposes of fire safety in residential buildings. The regulations specify minimum periods of fire resistance required by different building elements. These periods vary according to the use and size of the dwelling.

It is worth keeping in mind that the greater the fire hazard, then the greater the period of fire resistance needed to protect the elements within the building. The materials used for walls and ceilings are also controlled to reduce the risk of fire growth and internal fire spread.

Further information can be found on page 110 or in our **FIRE** BOOK, available for free download from *www.british-gypsum.com/literature/fire_book.aspx*

Thermal insulation

One of the key considerations in renovating a property is how to make it more energy efficient, reducing fuel bills and making the rooms more comfortable to live in. Cold houses or rooms can be a sign of inefficient insulation. If you are converting a blockwork or brick-built outhouse into an additional room, or refining the efficiency of an older property, you will need to improve its retention of heat. Gyproc ThermaLine **PIR** can provide the solution in the form of lining the interior of the external wall, dramatically increasing the overall thermal performance. Careful thought should go into improving the thermal insulation of walls and minimising air leakage at an early stage. Heating regimes and pattern of usage should also be considered when choosing an insulation solution.

Basements and cellars

Rooms beneath the ground can be tricky to treat, as moisture can enter through the surrounding ground, or condensation can form on the inside if the room has been tanked.

Further information can be found on page 122 or in our **WHITE** BOOK, available for free download from *www.british-gypsum.com/literature/white_book.aspx*

Sound insulation

To minimise sound transferring through and around the home, there are a variety of different measures that can be taken, depending on where the noise is coming from and what type of sound is causing the problem.
The noise that is generated and how it travels in a house will be different to that in the corridors of an apartment block, or even between flats. Sound will also carry and be bounced differently on internal partitions compared to the interior of external walls. Products like Gyproc SoundBloc, Gyproc TriLine, Gyproc DuraLine and Thistle plasters can provide excellent choices to combine with Gypframe components for acoustic performance.

Building Regulations Approved Document E gives guidance on what is a reasonable standard of sound insulation in the home, both between and within all residential dwellings. However, it is worth noting that these regulations are targeted for new build and conversions, but can be used as a guide for upgrading or installing sound/acoustic insulation in a residential building. If you are looking to replace entire walls, systems such as **GypWall CLASSIC**, **GypWall QUIET** or **GypWall QUIET IWL** and **GypWall QUIET SF** can all provide acoustic performance to building regulations standard.

Noisy neighbours

Noisy neighbours can be a nuisance; however this is a problem often caused by poor acoustic/sound insulation when the building was first constructed. However, systems such as **DriLyner RF** can reduce sound travelling between separating walls within an existing structure. See 'Acoustic Upgrades' from page 94 for details on these systems. Whether it's mid-range frequency (such as speech) or low-range frequency (such as surround sound systems), we can help block it out. Acoustic performance can be enhanced by using **DriLyner SI** or **RF** combined with Gyproc TriLine boards, for example. Alternatively, if your surface needs replacing and the background is blockwork or bricks, our Thistle two coat plaster system combines an undercoat plaster with a skim finish and could provide an excellent acoustic solution. For our full range of plasters, see the Plaster Selector Guide on pages 76 and 77.

Further information about reducing the travel of sound, for extensions or new build projects within homes, can be found in our HomeSpec 5 guide. It is available for free download from *www.british-gypsum.com/residential*

Moisture resistance

Bathrooms and kitchens need extra protection from moisture, which is generated through daily household activities. Particular attention should be paid to the surrounding areas of wet rooms, sinks, showers and baths, as the likelihood of walls getting damp is much higher. When upgrading a property's bathroom or kitchen areas, such as under the Decent Homes scheme, solutions like Glasroc H **TILEBACKER** can offer outstanding performance where there is frequent exposure to water. Other solutions such as Gyproc Moisture Resistant can also be used in areas that are subject to high levels of intermittent moisture.

Acoustic and moisture properties

Reducing noise transferring between rooms, particularly bedroom and bathroom walls, can help to make rooms feel more comfortable.
When you want to improve both the acoustic and moisture resistant qualities in a partition wall – for example, a bathroom adjacent to a bedroom – there is also a requirement to reduce potential noise transferring through the walls and protect the wall from moisture. Our acoustic boards are also available with moisture resistant performance. Gyproc SoundBloc **MR** would be perfect for this job.
See page 106 for details about our range of **MR** boards.

Vapour control

Hot washing-up water, boiling kettles, baths, showers and cooking can create moisture vapour in the air. If a barrier is not put in place, the moisture can travel through ceilings and hit colder air. This vapour then condenses to form on the opposite side of the ceiling in the roof or loft space, which can lead to dampness and deterioration.
Gyproc **DUPLEX** boards can serve as the ideal solution to this problem and therefore stop potential for rot and erosion to internal structures.
For more information about the range of vapour control systems and boards, go to page 106.

Indoor air quality

Though we don't notice them, impurities, such as volatile organic compounds (VOCs) are often present in the air we breathe - emitted from furniture, carpets and building materials. Long-term exposure to these can potentially cause health problems and reduce general wellbeing.

Clean air, on the other hand, can reduce headaches, nausea and eye irritation.

ACTIV*air* is our latest technology designed specifically to convert formaldehyde, a common VOC, into non-harmful inert compounds, removing up to 70% of the formaldehyde concentration in the indoor air. This clever technology continues to work for over 50 years, and whilst alternative solutions absorb formaldehyde, they don't decompose like **ACTIV*air*** risking re-emission at a later date.

Design considerations

Selecting the right refurbishment solution for any property can be a complex decision. It involves both choosing the best products and systems, and ensuring they meet a whole range of building codes and standards governing the quality and performance of the work.

The key requirements are outlined below:

Sound insulation

Reducing noise transmission between adjacent dwellings, and between some rooms within a dwelling is a key consideration. This ensures a comfortable home and can combat the problem of noisy neighbours.

Building Regulations Approved Document E (England and Wales), or Section 5 (Scotland), state that, when carrying out refurbishment or conversion work, buildings must comply with minimum levels of sound transfer performance. Whilst the two standards vary slightly, they both specify minimum levels for separating walls and floors. For England and Wales, communal areas and corridors in flats and apartments are also covered. See table 1 for standards in England and Wales.

Table 1 – Minimum sound performance standards

Element England and Wales (Approved Document E)	Minimum airborne sound transmission (site test result) D_{nTw} + Ctr	Minimum impact sound transmission (site test result) L_{nTw}	Minimum airborne sound transmission (lab test result) R_w
Separating walls between rooms created by change of use	43dB		
Separating floors between dwellings and rooms used for residential purposes	45dB	62dB	
An internal wall or floor between a bathroom / WC and a habitable room. Also between bedrooms and other rooms within a dwelling.*			40dB

*Internal walls which include a door are exempt from this requirement.

Standard 5.1 states:

Every building, which is divided into more than one area of different occupation, must be designed and constructed in such a way to limit the transmission of source noise from normal domestic type activities, between such areas, to a level that will not threaten the health of, or cause inconvenience to, the building occupants.

Table 2 – Minimum sound performance standards, Scotland

Design Performance Levels	**New-build and conversions** (not including traditional buildings)	**Conversion of traditional buildings***
Minimum airborne sound insulation	D_{nTw} 56dB	D_{nTw} 53dB
Maximum impact sound transmission	L_{nTw} 56dB	L_{nTw} 58dB

*Definition of traditional buildings
A building or part of a building of a type constructed before or around 1919
a) using construction techniques that were commonly in use before 1919; and
b) with permeable components, in a way that promotes the dissipation of moisture from the building fabric.

Standard 5.2 states:

Every building must be designed and constructed in such a way to limit the transmission of source noise from normal domestic type activities, through a wall or floor and between a room and internal space where noise is likely to occur to a level that will not cause inconvenience to the building occupants.

Standard 5.2 applies to a wall or floor forming a room in a dwelling, or a room in a residential buidling, which is capable of being used for sleeping. It does not apply to a wall between an en-suite bathroom and the room it serves or walls within a hospital or place of lawful detention.

Minimum airborne sound insulation R_w 43dB.

Thermal insulation

To ensure a home is comfortable and affordable to heat, thermal upgrading can be required. There is also increasing pressure to cut energy usage and greenhouse gas emissions to meet government targets under the Climate Change Act.

Building Regulations Approved Document L1B (ADL 1B) or Section 6 (Scotland) set the standards of thermal performance needed when carrying out renovations or extensions to existing dwellings.

Section 6 standards remain the same for all repair, maintenance and improvement works. However, under Approved Document L1B (ADL 1B), they vary depending on whether you are extending the property, renovating walls, floors or roof spaces or replacing part of the external thermal envelope.

Table 2 – Elemental U-values

Element	U-value (W/m^2K)			
	England and Wales (ADL 1B)		Scotland (Section 6)	
	New element in extension	Upgrade or replacement element in existing building	Any refurbishment a	b[2]
Wall	0.28	0.30[1] (0.70*)	0.19 (0.70*)	0.22
Floor	0.22	0.25 (0.70*)	0.15 (0.70*)	0.18
Pitched roof insulation at ceiling level	0.16	0.16 (0.35*)	0.13 (0.35*)	0.15
Pitched roof insulation between rafters	0.18	0.18 (0.35*)	0.15 (0.35*)	0.18
Flat roof (or roof with integral insulation)	0.18	0.18 (0.35*)	0.15 (0.35*)	0.18

[1]Cavity walls suitable for the insulation of cavity insulation can be 0.55 when upgrading existing (retained) thermal elements.
[2]Column b applies where the bracketed parameter figures in column a do not apply.
*If the element has a U-value worse than shown in brackets, it should be upgraded to the adjacent figure.

Fire resistance

Fire safety and the protection of residents are crucial building requirements. Under the Regulatory Reform (Fire Safety) Order of 2006, the building owner is legally liable for the fire safety of the building. It is the building owner's responsibility to carry out risk assessments and identify young or disabled residents who may be especially at risk. This is particularly important in the social sector because of the higher proportion of 'at risk' residents.

Building Regulation Approved Document B Volume 1 (England and Wales) includes minimum periods of fire resistance for separating walls and floors. Requirements vary depending on the use and size of the building. Higher risk buildings, such as multi-storey flats or apartments, require higher levels of fire resistance. There are also regulations covering internal lining materials to reduce the risk of fire spread and internal fire growth.

Guidance on issues such as fire safety management, means of escape and fire fighting facilities can also be found in BS 9999 (Code of Practice for fire safety in the design, construction and use of buildings).

Repair

Maintain

Improve

Repair, maintain and improve

Depending on the type of work you're wanting to carry out, you'll need different solutions to help you repair, maintain or improve your housing stock.

Use this simple navigation tool to find what you need in this guide.

What work are you carrying out?

Repair	**Maintain/upgrade**	**Improve**
For example, repairing damaged walls, partitions and ceilings	For example, solutions for big changes to a property, such as a new kitchen or updating the bathroom, to maintain the standard of living	For example, large scale renovations, including redesigning layouts, building fabric upgrades or extensions
Go to page 31	Go to page 32	Go to page 33

Water damage

Damage or destruction by water within social housing can mean the rapid travel of water between homes, meaning repairs need to be timely, tough and cost effective. Turn to page 148 for further information.

Repair

Social housing repair is a source of constant concern, often without clear information on the type or scale of the issue. Following this flow chart should make repairs to most internal fabrics easier to understand.

What are you intending to repair?

Wall or partition
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it plaster?
- Go to page 70

Lining
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it board stuck to masonry?
  - No?
  - Yes? Go to page 86
- Is it plaster?
- Go to page 70

Ceiling
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it tiles in a grid?
  - No?
  - Yes? Go to page 140
- Is it plaster?
- Go to page 70

Fire protection
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Board fixed to a board?
- Go to page 116

Did you know?

It's important to remember to pre-treat your walls and ceilings with ThistleBond-it if they're very smooth and need a mechanical key.

Maintain/upgrade

Depending if you're looking to upgrade a single feature, modernise a whole room or roll-out a complete upgrade scheme, follow the chart below to help identify the correct solutions for your project.

What are you intending to maintain/upgrade?

		Wall or partition?	Lining?	Ceiling?	Fire protection?
	Thermal performance	Go to page 122 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 122 Consider **GypLyner IWL**	Go to page 122 Consider **CasoLine MF**	Go to page 122 Consider **GypLyner IWL**
	Vapour control	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Acoustic performance	Go to page 94 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 94 Consider timber joist floors and **CasoLine MF**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**
	Fire resistance (also see Fire stopping, page 118)	Go to page 110 Consider **GypWall CLASSIC**	Go to page 110 Consider **GypLyner IWL**	Go to page 110 Consider timber joist floors and **CasoLine MF**	Go to page 110 Consider **GypLyner IWL**
	Moisture resistance	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Impact resistance	Go to page 90 Consider Thistle plaster and **GypWall EXTREME**	Go to page 90 Consider Thistle plaster and **GypLyner IWL**	Go to page 90 Consider Thistle Durafinish	Go to page 90 Consider Thistle plaster and **GypLyner IWL**
	Aesthetic improvement	Go to page 128 Consider Thistle plaster	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 128 Consider Thistle plaster and **CasoLine MF**	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**
	Indoor air quality improvement	Go to page 152	Go to page 152	Go to page 152	Go to page 152

For the full range of Thistle plasters, see the Plaster Selector Guide on pages 76 and 77.

Improve

This guide can help to point you in the right direction by providing solutions for the complete renewal of existing spaces.

We have produced specific sector guides to assist the selection of the perfect system for your project.

Homespec 5, The **WHITE** BOOK Residential sector guide and the **WHITE** BOOK provide a comprehensive suite of solutions that are suitable for social housing projects.

These guides will:

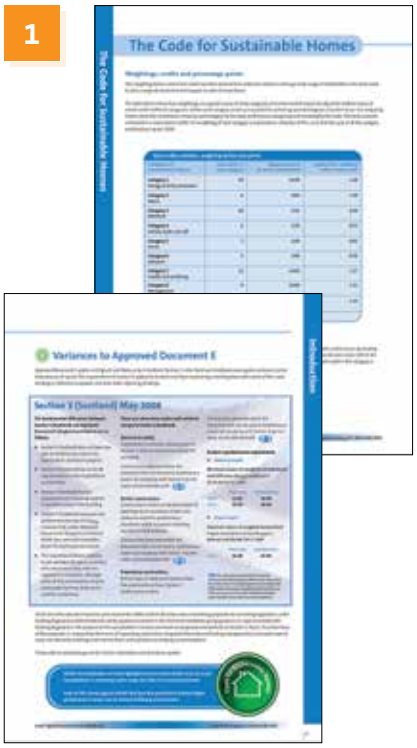
1 Explain the regulatory requirements, and how British Gypsum can help.

2 Identify and select solutions.

3 Provide support for common details and issues.

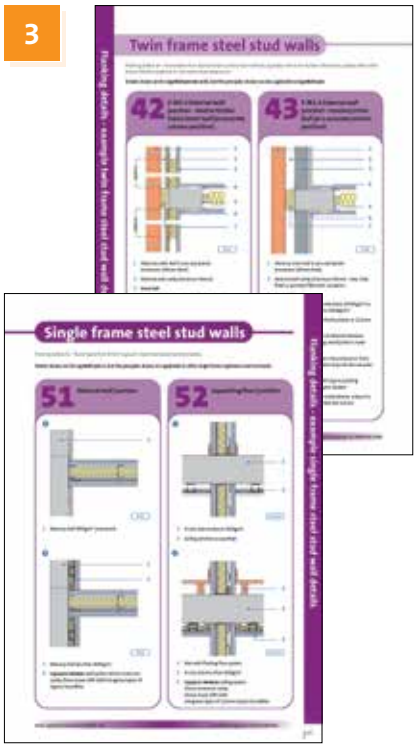
This document can be downloaded for free from the British Gypsum website at www.british-gypsum.com/residential

1



2

3



Commercial

For buildings that work as hard as you do.

Enabling buildings to work harder for longer and the creation of healthier, functional spaces.

Repair Maintain Improve

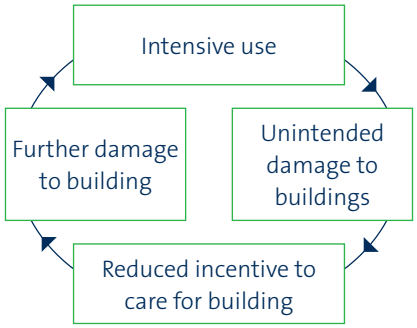
Commercial buildings need to comply with a wide range of regulatory and legislative requirements, whilst providing a healthy, hard working environment which stands the test of time.

This section of the guide is divided into Education, Offices, High-Rise Multi-Occupancy, Retail and Healthcare, making it easier to find just what you're looking for.

Repair

When damage occurs in a commercial building, it is vital to restore the area to its original performance specification. This is to avoid compromising the safety, health and wellbeing of the people using it.

The way a building looks will affect the way people feel about it and in turn the manner in which they use it. This can lead to a vicious circle of damage.



Maintain

To avoid the need for repair, effective maintenance is essential. Retaining the performance of a building is all part of making sure it continues to function as intended.

Improve

In situations where it is necessary to upgrade a space or totally change its use, the approach taken would be the same as for the creation of an entirely new space for an existing structure.

Despite the diversity of the buildings considered in this commercial section, they all have one thing in common. They all need to continue meeting their intended use without interruption to either income generation or to the service they are providing.

Whatever the repair, maintenance or improvement project, we have a high performance solution.

Water damage

In a commercial building, water damage cannot only be detrimental to the aesthetics of the affected area, but also to its use. These factors impact the possible revenue generated by the space and as a result it's key that the area can be restored as quickly and efficiently as possible. Turn to page 148 for further information.

Commercial – Education

Creating spaces where the future is developed.

Minimising noise, maximising functionality and implementing cost effective measures that stand the test of daily use.

Repair Maintain Improve

The nature of school, college and university life provides a challenge for any building. With high levels of traffic and daily scuffs and scrapes, internal linings are constantly under attack.

Spaces are reorganised as teaching requirements change; new classrooms and learning facilities are created to serve growing student numbers.

Repair and maintenance is a daily fact of life. With demands for ever-higher standards of achievement, it's crucial that we maintain the highest quality educational environment for both teaching staff and students.

Repairs need to be carried out quickly and effectively to minimise disruption to educational life. Tight control over costs is also essential as funding becomes scarcer and budget responsibility is increasingly moved over from Local Authorities to individual establishments.

We've worked closely with designers and facilities' managers to develop repair and maintenance solutions. They meet every performance requirement, yet are quick and easy to complete. Plasters that provide high abrasion resistance for corridors and stairwells; partitions that separate quiet and noisy spaces; ceilings that absorb noise and capture formaldehyde to create better and healthier learning spaces – the list goes on.

We provide a wide range of internal lining solutions for education buildings. Whether you're repairing, carrying out maintenance or adding new facilities, you'll find the solutions you need in this guide.

Did you know?

In areas that repeatedly require repairing, more robust solutions, such as **GypWall ROBUST**, may be beneficial. It incorporates Gyproc DuraLine and offers a cost effective, single layer solution that achieves Severe Duty to BS 5234. For ultimate damage resistance, you could consider **GypWall EXTREME**, which uses Rigidur **H** to achieve performances significantly above the requirements of BS 5234. It can reduce damage caused by impacts and glancing blows in even the toughest environments. See page 90 in 'Damage resistance' for more information.

Repair

Maintain

Improve

Repair, maintain and improve

The type of work you're wanting to carry out will inform which solution you choose to help you either repair, maintain or improve your school, college or university.

Use this simple navigation tool to find what you need in this guide.

What work are you carrying out?

Repair For example, repairing damaged walls, partitions and ceilings	**Maintain/upgrade** For example, changes to a building, new catering facilities or modernising bathrooms to maintain the standard	**Improve** For example, large scale renovations, including redesigning layouts, building fabric upgrades or extensions
Go to page 39	Go to page 40	Go to page 41

For water damage see page 148.

Did you know?

For impact resistance in high footfall areas, Gyproc DuraLine plasterboards skim finished with Thistle Durafinish plaster make a perfect team. For more information on damage resistance, see page 90.

Repair

In most education facilities, reactive repair is a source of constant concern, often with additional implications to room availabilities. Following this flow chart should make repairs to most internal fabrics easier to understand.

What are you intending to repair?

Wall or partition
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it plaster?
- Go to page 70

Lining
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it board stuck to masonry?
  - No?
  - Yes? Go to page 86
- Is it plaster?
- Go to page 70

Ceiling
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it tiles in a grid?
  - No?
  - Yes? Go to page 140
- Is it plaster?
- Go to page 70

Fire protection
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Board fixed to a board?
- Go to page 116

Did you know?

The presence of damage and graffiti in education buildings has been linked to increases in the rate at which future damage and graffiti occurs. Considering this, it is often more cost effective to complete reactive repairs early to reduce overall costs.

Maintain/upgrade

Whether you are looking to upgrade a single building element, a room or the whole of your education facility, the table below should help identify the correct solutions for your project.

What are you intending to maintain/upgrade?

		Wall or partition?	Lining?	Ceiling?	Fire protection?
	Thermal performance	Go to page 122 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 122 Consider **GypLyner IWL**	Go to page 122 Consider **CasoLine MF**	Go to page 122 Consider **GypLyner IWL**
	Vapour control	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Acoustic performance	Go to page 94 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 94 Consider timber joist floors and **CasoLine MF**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**
	Fire resistance (also see Fire stopping, page 118)	Go to page 110 Consider **GypWall CLASSIC**	Go to page 110 Consider **GypLyner IWL**	Go to page 110 Consider timber joist floors and **CasoLine MF**	Go to page 110 Consider **GypLyner IWL**
	Moisture resistance	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Impact resistance	Go to page 90 Consider Thistle plaster and **GypWall EXTREME**	Go to page 90 Consider Thistle plaster and **GypLyner IWL**	Go to page 90 Consider Thistle Durafinish	Go to page 90 Consider Thistle plaster and **GypLyner IWL**
	Aesthetic improvement	Go to page 128 Consider Thistle plaster	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 128 Consider Thistle plaster and **CasoLine MF**	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**
ACTIV air	Indoor air quality improvement	Go to page 152	Go to page 152	Go to page 152	Go to page 152

For the full range of Thistle plasters, see the Plaster Selector Guide on pages 76 and 77.

Improve

Information in this guide can be used to provide solutions for the complete renewal of existing spaces.

We have produced specific sector guides to assist understanding and to provide the supporting information required for this type of work.

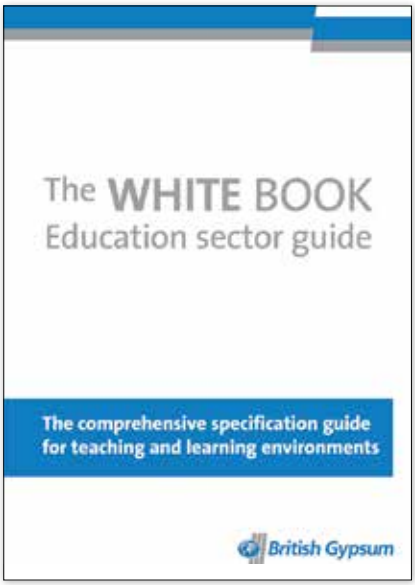
For education, please consider using The **WHITE** BOOK Education sector guide.

This guide will:

1 Explain the regulatory requirements, and how British Gypsum as a company can help.

2 Identify and select solutions.

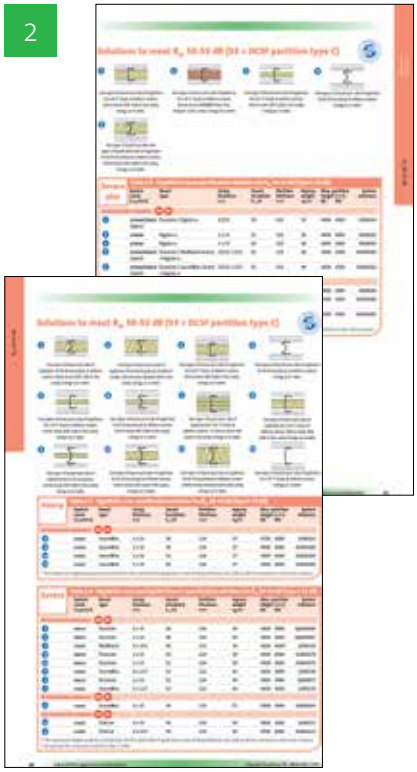
3 Provide support for common details and issues.



This document can be downloaded for free from the British Gypsum website at www.british-gypsum.com/Sectors

1

2



3

Commercial – Offices

Making the difference to working environments.

Flexible solutions that provide high acoustic absorption whilst delivering high air quality.

Repair Maintain Improve

Reorganisation of office space and installation of new and updated IT systems and equipment can mean commercial interiors are in a state of constant change.

New office layouts, walls and partitions, new and replacement ceilings are in regular demand.

The work needs to be carried out quickly and efficiently using systems that provide the highest quality performance with minimum disruption to day-to-day activities. Space can be at a premium, so high performance solutions that enable you to maximise floor space are important.

Our integrated wall linings, partitions and ceilings give guaranteed performance in key areas, like sound control and fire safety, and are quick and easy to install. We have acoustic walls for extra privacy; acoustic ceilings that create the perfect office environment, while capturing productivity-harming formaldehyde; abrasion resistant finishes for lobbies and foyers. In fact, we have systems for just about every requirement.

Whether you're repairing, replacing or completely refurbishing your office interior, we are able to provide a full suite of solutions.

Did you know?

As buildings become more airtight, the issue of indoor air quality becomes increasingly important. Volatile Organic Compounds (VOCs) are released by everyday items brought into any building. High content of VOCs in the air can lead to many problems, including increased incidence of headaches, reduced concentration and efficiency. We have developed a range of products with **ACTIV*air*** technology that decomposes formaldehyde, a common VOC, into non-harmful inert compounds thus eliminating the risk of re-emission.

ACTIV*air* from British Gypsum is a new technology added to Gyproc DuraLine, Gyproc SoundBloc and Rigidur H plasterboards, Thistle PureFinish and Gyptone ceiling products.

See page 152 for more information.

Repair

Maintain

Improve

Repair, maintain and improve

The type of repair, maintainance or improvement work you're planning to do will influence the type of solution required and how you could use them in your office.

Use this simple navigation tool to find what you need in this guide.

What work are you carrying out?

Repair For example, repairing damaged walls, partitions and ceilings	**Maintain/upgrade** For example, changes to a building, new commercial facilities or modernising bathrooms	**Improve** For example, large scale renovations, including redesigning layouts, building fabric upgrades or extensions
Go to page 45	Go to page 46	Go to page 47

For water damage see page 148.

Did you know?

Studies have shown that the quality of a workspace can directly affect the productivity and creativity of a workforce, and as such repairing damage early can improve a business' overall performance.

Repair

Within an office environment, reactive repair can be worrying as it often has additional implications. Following this flow chart should make repairs to most internal fabrics easier to understand.

What are you intending to repair?

Wall or partition
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it plaster?
- Go to page 70

Lining
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it board stuck to masonry?
  - No?
  - Yes? Go to page 86
- Is it plaster?
- Go to page 70

Ceiling
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it tiles in a grid?
  - No?
  - Yes? Go to page 140
- Is it plaster?
- Go to page 70

Fire protection
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Board fixed to a board?
- Go to page 116

Did you know?

When it comes to fire prevention measures, the essential factor to consider is to give occupants more time to escape if a fire were to break out. This means that the walls, floors and ceilings must be able to hold the fire at bay for longer. Both Gyproc DuraLine and Gyproc FireLine offer excellent fire resistance, see page 112. These boards can then be combined with a skim finish, using a choice of Thistle Board Finish, Thistle Multi-Finish or, to add damage resistance, Thistle Durafinish.
If the project spans over a number of rooms or offices then Thistle Spray Finish could also offer the answer, see the Plaster Selector Guide on pages 76 and 77.

Maintain/upgrade

Whether you are looking to upgrade a single feature or modernise the whole of your office building, the table below should help identify the correct solutions for your project.

What are you intending to maintain/upgrade?

		Wall or partition?	Lining?	Ceiling?	Fire protection?
	Thermal performance	Go to page 122 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 122 Consider **GypLyner IWL**	Go to page 122 Consider **CasoLine MF**	Go to page 122 Consider **GypLyner IWL**
	Vapour control	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Acoustic performance	Go to page 94 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 94 Consider timber joist floors and **CasoLine MF**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**
	Fire resistance (also see Fire stopping, page 118)	Go to page 110 Consider **GypWall CLASSIC**	Go to page 110 Consider **GypLyner IWL**	Go to page 110 Consider timber joist floors and **CasoLine MF**	Go to page 110 Consider **GypLyner IWL**
	Moisture resistance	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Impact resistance	Go to page 90 Consider Thistle plaster and **GypWall EXTREME**	Go to page 90 Consider Thistle plaster and **GypLyner IWL**	Go to page 90 Consider Thistle Durafinish	Go to page 90 Consider Thistle plaster and **GypLyner IWL**
	Aesthetic improvement	Go to page 128 Consider Thistle plaster	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 128 Consider Thistle plaster and **CasoLine MF**	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**
ACTIV air	Indoor air quality improvement	Go to page 152	Go to page 152	Go to page 152	Go to page 152

For the full range of Thistle plasters, see the Plaster Selector Guide on pages 76 and 77.

Improve

Information in this guide can be used to provide solutions for the complete renewal of existing spaces.

We detail all our solutions within The **WHITE** BOOK where you can find the full range of products to support any office improvement project.
The **WHITE** BOOK can be downloaded from the British Gypsum website.

The guide will:

1 Outline typical regulatory requirements and how British Gypsum can help.

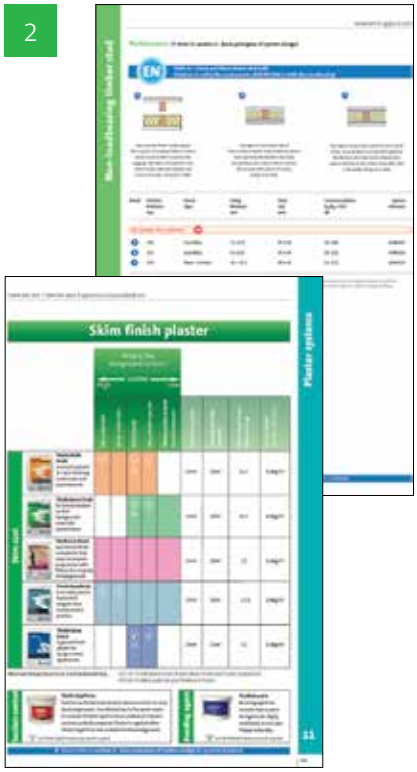
2 Identify and select solutions.

3 Provide support for common details and issues.

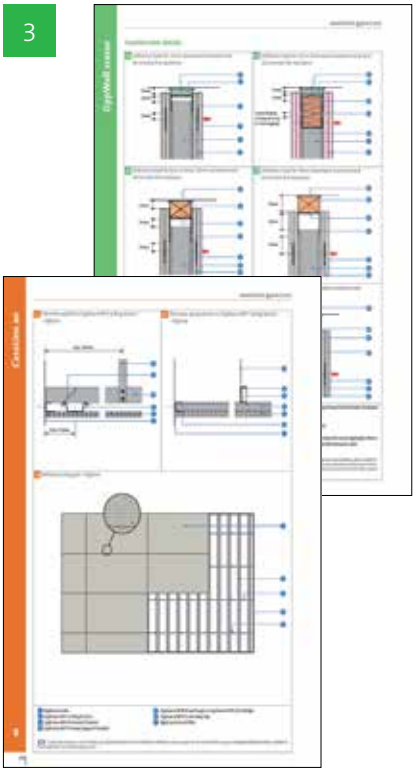
This document can be downloaded for free from the British Gypsum website at www.british-gypsum.com/Sectors.aspx

1

2



3



Commercial – High-Rise Multi-Occupancy

Noise reduction, safety and durability.

Where performance is key and looking good is essential, we provide the answers.

Repair Maintain Improve

The High-Rise Multi-Occupancy category includes a wide range of building types; from hotels and student accommodation to homes for key workers.

They present the same range of performance challenges as similar low-rise buildings, but with added demands on fire safety to allow evacuation.

Repair and maintenance solutions must be robust to minimise future repairs, particularly in corridors and communal areas. With generally restricted access to upper floors via lifts and stairs, repair teams and contractors also have to plan repair and maintenance work carefully and use lightweight, easily portable repair components where possible.

Our plaster and plasterboard systems provide all the performance you need and they're lightweight and quick to install, so cause minimum disruption to residents. Partitions, separating walls, wall linings, ceilings – we provide them all.

Whether it's simple reactive repairs, routine maintenance or a major refit, we provide you with effective, smart and durable solutions.

Did you know?

Solutions specified can sometimes underestimate the intensity of the building's future use. Such circumstances can lead to increased damage and unplanned maintenance. It is often advisable to upgrade the robustness of such areas with more robust plaster solutions such as Thistle Durafinish, or more robust plasterboards such as Gyproc DuraLine.

See page 90 for more information on damage resistance.

Repair

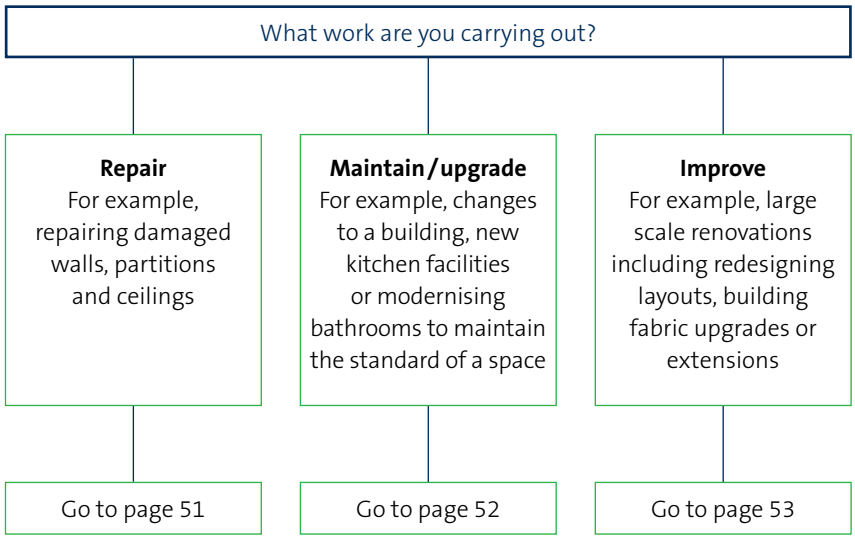
Maintain

Improve

Repair, maintain and improve

Repair, maintenance or improvement work will vary depending on the level of work and location.

Use this simple navigation tool to find what you need to deliver your project.



For water damage see page 148.

Did you know?

Noise in corridors tends to bounce, which can make noise travel further and feel louder than it was originally. Gyproc SoundBloc and Thistle plaster can provide the solution to better acoustic performance and reducing noise travelling. See the 'Acoustic upgrades' section on page 94 for more ideas on better acoustics.

Repair

Within High-Rise Multi-Occupancy reactive repair is a source of constant concern, often without clear information on the type or scale of the issue and with consequences for available space. Following this flow chart should make repairs to most internal fabrics easier to understand.

What are you intending to repair?

Wall or partition
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it plaster?
- Go to page 70

Lining
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it board stuck to masonry?
  - No?
  - Yes? Go to page 86
- Is it plaster?
- Go to page 70

Ceiling
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it tiles in a grid?
  - No?
  - Yes? Go to page 140
- Is it plaster?
- Go to page 70

Fire protection
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Board fixed to a board?
- Go to page 116

Did you know?

When repairing damage in a residential environment, speed and quality matter. A quick job that needs to be revisited is as bad as any job that is left unfinished. Once a repair has been made and a finished skim plaster applied, a first coat of breathable paint can be completed before the plaster has even finished drying.

Maintain/upgrade

Whether you are looking to upgrade a single building element, update a room or roll-out a complete upgrade scheme, follow the table below to help identify the correct solutions for your project.

What are you intending to maintain/upgrade?

		Wall or partition?	Lining?	Ceiling?	Fire protection?
	Thermal performance	Go to page 122 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 122 Consider **GypLyner IWL**	Go to page 122 Consider **CasoLine MF**	Go to page 122 Consider **GypLyner IWL**
	Vapour control	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Acoustic performance	Go to page 94 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 94 Consider timber joist floors and **CasoLine MF**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**
	Fire resistance (also see Fire stopping, page 118)	Go to page 110 Consider **GypWall CLASSIC**	Go to page 110 Consider **GypLyner IWL**	Go to page 110 Consider timber joist floors and **CasoLine MF**	Go to page 110 Consider **GypLyner IWL**
	Moisture resistance	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Impact resistance	Go to page 90 Consider Thistle plaster and **GypWall EXTREME**	Go to page 90 Consider Thistle plaster and **GypLyner IWL**	Go to page 90 Consider Thistle Durafinish	Go to page 90 Consider Thistle plaster and **GypLyner IWL**
	Aesthetic improvement	Go to page 128 Consider Thistle plaster	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 128 Consider Thistle plaster and **CasoLine MF**	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**
	Indoor air quality improvement	Go to page 152	Go to page 152	Go to page 152	Go to page 152

For the full range of Thistle plasters, see the Plaster Selector Guide on pages 76 and 77.

Improve

Information in this guide can be used to provide solutions for the complete renewal of existing spaces.

We produce specific sector guides to assist understanding and to provide the supporting information required for this type of work.

For High-Rise Multi-Occupancy buildings, please consider using The **WHITE** BOOK High-Rise Multi-Occupancy sector guide.

This guide will:

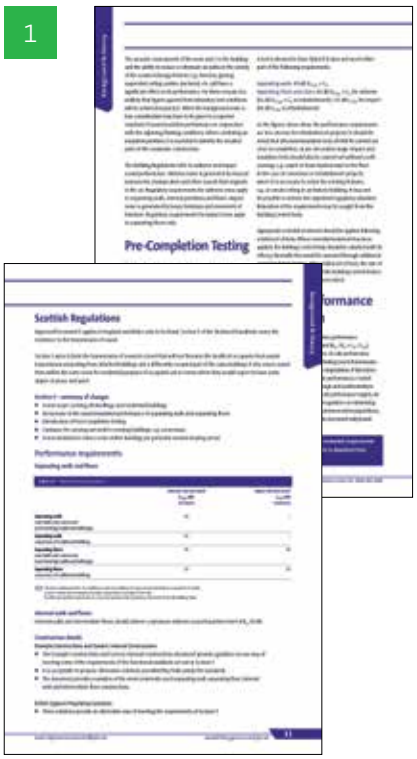
1 Explain the regulatory requirements, how British Gypsum can help.

2 Identify and select solutions.

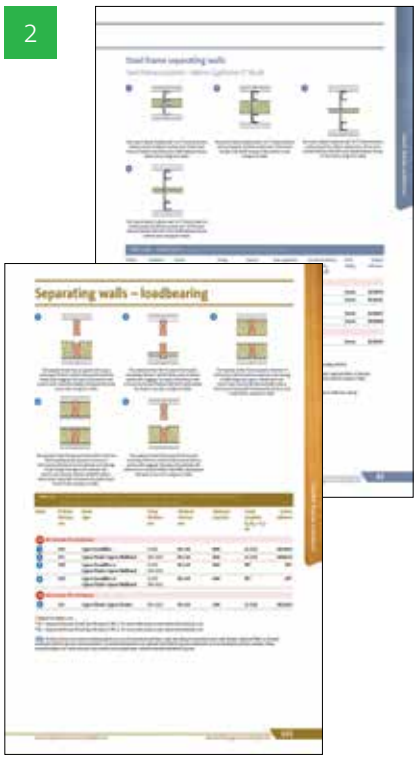
3 Provide support for common details and issues.

This document can be downloaded for free from the British Gypsum website at www.british-gypsum.com/high-rise

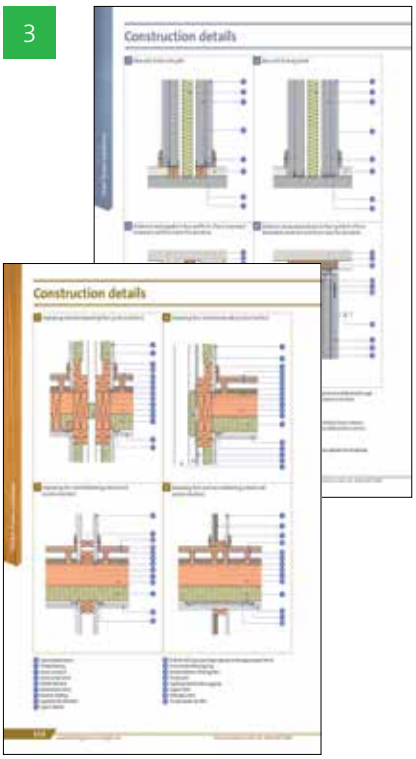
1



2



3



Commercial – Retail

Creating recreational spaces that always look their best.

Working harder to deliver the latest features in durability, fire protection, health and safety.

Repair Maintain Improve

With shoppers increasingly opting for the convenience of online shopping, it's crucial that shops are able to fight back with new and updated interiors that create the right mood for the moment.

This means interiors that both help you to retain existing business and attract new generations of customers for the future.

Our lightweight wall and ceiling systems enable you to create exciting new interiors that combine performance with great design. They're cost effective, quick to install and will keep looking good until your next update.

We have linings to make old walls look like new; plasters to stand up to even the busiest shopping environment; perforated ceiling tiles that will wow your customers whilst creating the perfect acoustic ambience for your business and much more.

Our high performance internal linings will help when you need to repair and maintain your property, or when you need a complete refit to stay ahead of market changes. You'll find a range of practical solutions showcased in this guide.

Did you know?

Retail spaces have to suit the needs of several groups at once, balancing function, durability and aesthetics. A positive customer experience is paramount, yet the environment must also be functional as a work space for the retailer. Retail is also prone to regular reconfiguration and exposed to high noise levels. The Gyptone range of acoustic ceiling solutions combines design and performance. The result is stunning, distinctive aesthetics with high levels of sound absorption. This makes them ideal for use in retail – the designs and patterns can be easily interchanged to suit the changing performance or design requirements, as well as the fast moving pace of retail. See 'Ceiling solutions' for more information on page 142.

Repair

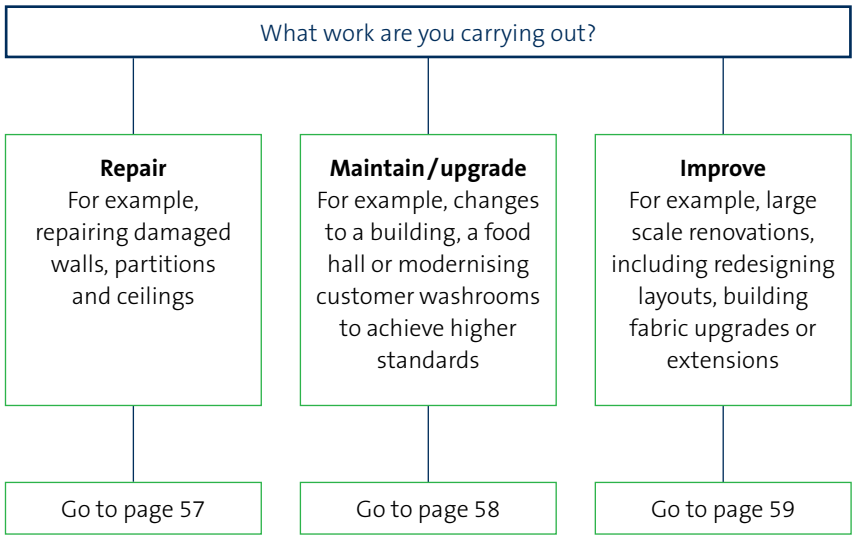
Maintain

Improve

Repair, maintain and improve

Repair, maintenance or improvement work will vary depending on the level of work and location.

Use this simple navigation tool to find what you need to deliver your retail environment.



For water damage see page 148.

Did you know?

Speed of repair is essential to ensure that all retail floor space is available. As such, the correct solution for repair is critical in minimising the risk of repeat repairs in the future.

Repair

Within a retail environment reactive repair is a source of constant concern, often with additional implications to space availabilities. Following this flow chart should make repairs to most internal fabrics easier to understand.

What are you intending to repair?

Wall or partition
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it plaster?
- Go to page 70

Lining
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it board stuck to masonry?
  - No?
  - Yes? Go to page 86
- Is it plaster?
- Go to page 70

Ceiling
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it tiles in a grid?
  - No?
  - Yes? Go to page 140
- Is it plaster?
- Go to page 70

Fire protection
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Board fixed to a board?
- Go to page 116

Did you know?

In a retail environment, it is crucial that fire performance is maintained and partitions satisfy dual performance criteria. In addition to a two hour fire protection requirement, the dividing walls between each retail outlet would need to withstand impact resistance when wet. In the outbreak of a fire, the sprinkler system would activate, drenching the plasterboard. Gyproc FireLine **MR** offers that high level of protection, whilst maintaining its structural integrity when in contact with moisture. For information on fire performance, see page 110.

Maintain/upgrade

Whether you are looking to upgrade a single feature or the whole of your retail building, the table below should help identify the correct solutions for your project.

What are you intending to maintain/upgrade?

		Wall or partition?	Lining?	Ceiling?	Fire protection?
	Thermal performance	Go to page 122 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 122 Consider **GypLyner IWL**	Go to page 122 Consider **CasoLine MF**	Go to page 122 Consider **GypLyner IWL**
	Vapour control	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Acoustic performance	Go to page 94 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 94 Consider timber joist floors and **CasoLine MF**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**
	Fire resistance (also see Fire stopping, page 118)	Go to page 110 Consider **GypWall CLASSIC**	Go to page 110 Consider **GypLyner IWL**	Go to page 110 Consider timber joist floors and **CasoLine MF**	Go to page 110 Consider **GypLyner IWL**
	Moisture resistance	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Impact resistance	Go to page 90 Consider Thistle plaster and **GypWall EXTREME**	Go to page 90 Consider Thistle plaster and **GypLyner IWL**	Go to page 90 Consider Thistle Durafinish	Go to page 90 Consider Thistle plaster and **GypLyner IWL**
	Aesthetic improvement	Go to page 128 Consider Thistle plaster	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 128 Consider Thistle plaster and **CasoLine MF**	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**
ACTIV air	Indoor air quality improvement	Go to page 152	Go to page 152	Go to page 152	Go to page 152

For the full range of Thistle plasters, see the Plaster Selector Guide on pages 76 and 77.

Improve

Information in this guide can be used to provide solutions for the complete renewal of existing spaces.

For the full range of British Gypsum solutions that can provide the answers to your improvement projects, refer to the **WHITE** BOOK.

The guide will:

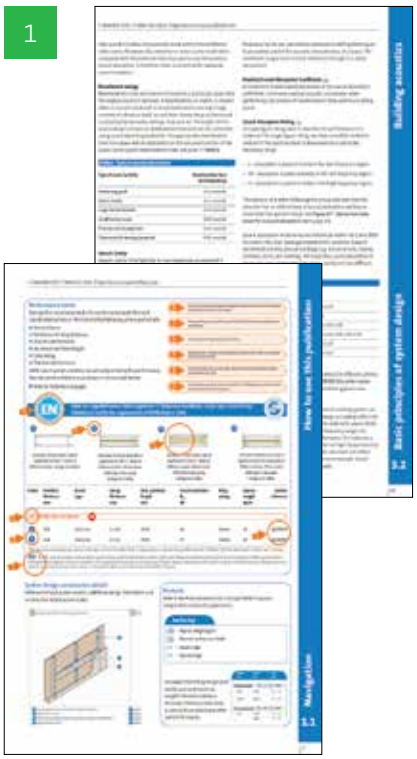
1 Outline typical regulatory requirements and how British Gypsum can help.

2 Identify and select solutions.

3 Provide support for common details and issues.

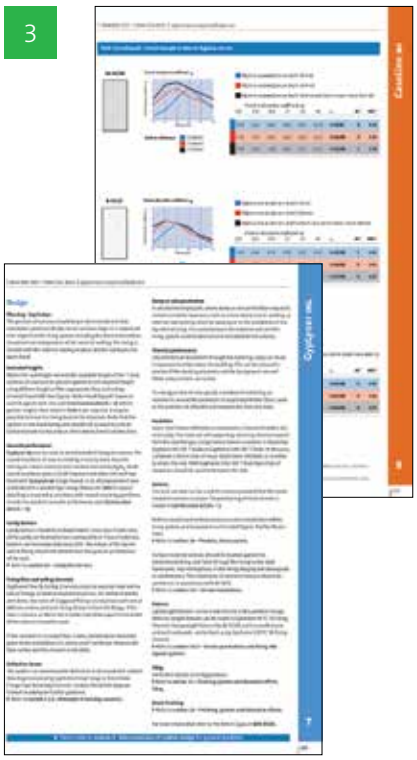
This document can be downloaded for free from the British Gypsum website at www.british-gypsum.com/Sectors.aspx

1



2

3



Commercial – Healthcare

Providing the backbone of 24 hour buildings.

Where acoustic absorption, durability and air quality matter.

Repair Maintain Improve

Healthcare environments are designed to provide protection and support for the elderly, the vulnerable and those in need of special care.

It is essential therefore, to not only create interiors that are clean and healthy, but which also help to promote healing.

Wall surfaces damaged through impacts with trolleys and wheelchairs provide breeding grounds for germs and bacteria, whilst in kitchens and bathrooms, damp walls and grubby surfaces can promote mould growth. Regular repair and maintenance is therefore crucial. When repair and maintenance is required in a building that is providing a frontline service 24 hours a day, it is critical that repairs can be carried out in a swift, effective and non-disruptive way. Our solutions enable this to happen.

It isn't just surfaces that are important, walls and ceilings must meet specified levels of fire performance and protect vulnerable patients from noise.

Our plaster and plasterboard lining systems provide simple and quick repairs for damaged walls and can provide high levels of impact resistance to reduce damage in the future. We have high performance acoustic walls for use in noise sensitive areas, ceiling systems that accommodate cables and services whilst capturing formaldehyde, a common VOC, from the air, and linings that protect against fire.

Whether you're carrying out reactive repairs, regular maintenance or creating new facilities, we offer a full complement of intelligent solutions that look after the health and wellbeing of patients and staff.

Did you know?

British Gypsum Gyprex tiles have been specially developed for environments where hygiene and cleanliness are essential.

All Gyprex tiles are highly durable and their vinyl laminate face means they are easily cleaned, reducing maintenance costs.

Gyprex **BIO** is an ideal solution for areas of buildings where enhanced levels of hygiene are vital, such as kitchens and toilets in hospital or healthcare buildings. Gyprex **BIO** has been developed with a high performance biocide integrated into the vinyl face of the tile. This antibacterial protection prevents the growth of bacteria, fungi and antinomycetes, including MRSA, Ecoli 0157 and Salmonella.

As the biocide is an integral component of the vinyl, it will continue to offer protection for the life span of the tile, and its performance will not be affected by washing or cleaning the tile surface.

For information on ceiling solutions, go to page 142.

Repair

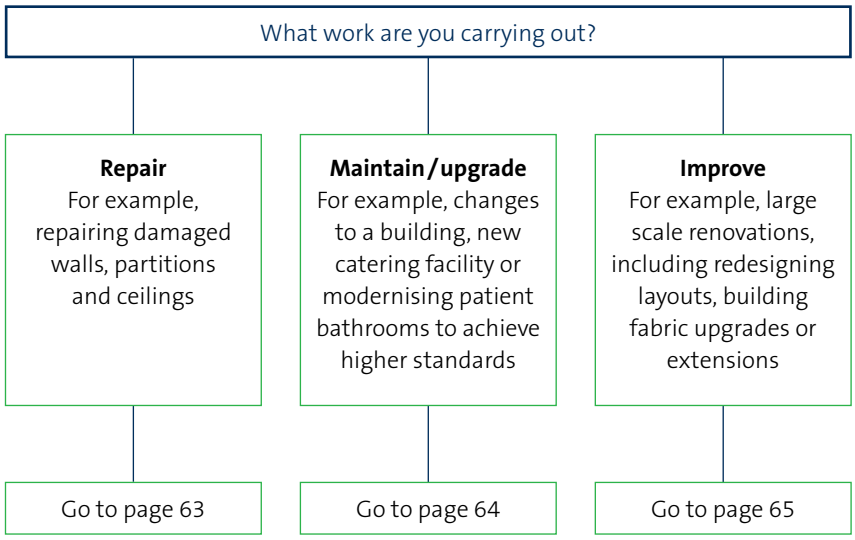
Maintain

Improve

Repair, maintain and improve

Repair, maintenance or improvement work will vary depending on the level of work and location.

Use this simple navigation tool to find what you need to deliver your chosen solution.



For water damage see page 148.

Did you know?

The presence of damage and graffiti in healthcare buildings has been linked to increases in the rate at which future damage and graffiti occurs. Considering this, it is often more cost effective to complete reactive repairs early to reduce overall costs.

Repair

Across the healthcare sector reactive repair is a source of constant concern, often with additional implications to room availabilities. Following this flow chart should make repairs to most internal fabrics easier to understand.

What are you intending to repair?

Wall or partition
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it plaster?
- Go to page 70

Lining
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it board stuck to masonry?
  - No?
  - Yes? Go to page 86
- Is it plaster?
- Go to page 70

Ceiling
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Is it tiles in a grid?
  - No?
  - Yes? Go to page 140
- Is it plaster?
- Go to page 70

Fire protection
- Is it surface damage?
  - No?
  - Yes? Go to page 78
- Is it water damage?
  - No?
  - Yes? Go to page 148
- Is it plasterboard on a frame?
  - No?
  - Yes? Go to page 82
- Board fixed to a board?
- Go to page 116

Did you know?

Thistle Durafinish is a new kind of plaster, unlike anything else on the market. Thanks to in-built resistance to accidental damage, it lasts much, much longer than normal finishing options. Plus, unlike expensive, heavy-duty alternatives, it doesn't need specialist application; your regular or on-site plasterer can easily do the job.
For information on our plaster range, see the Plaster Selector Guide on pages 76 and 77.

Maintain/upgrade

Whether you are looking to upgrade a single room or the whole of your healthcare facility, the table below should help identify the correct solutions for your project.

What are you intending to maintain/upgrade?

		Wall or partition?	Lining?	Ceiling?	Fire protection?
	Thermal performance	Go to page 122 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 122 Consider **GypLyner IWL**	Go to page 122 Consider **CasoLine MF**	Go to page 122 Consider **GypLyner IWL**
	Vapour control	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Acoustic performance	Go to page 94 Consider Thistle plaster and **GypWall CLASSIC**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 94 Consider timber joist floors and **CasoLine MF**	Go to page 94 Consider Thistle plaster and **GypLyner UNIVERSAL**
	Fire resistance (also see Fire stopping, page 118)	Go to page 110 Consider **GypWall CLASSIC**	Go to page 110 Consider **GypLyner IWL**	Go to page 110 Consider timber joist floors and **CasoLine MF**	Go to page 110 Consider **GypLyner IWL**
	Moisture resistance	Go to page 104	Go to page 104 Consider **GypLyner IWL**	Go to page 104 Consider **CasoLine MF**	Go to page 104 Consider **GypLyner IWL**
	Impact resistance	Go to page 90 Consider Thistle plaster and **GypWall EXTREME**	Go to page 90 Consider Thistle plaster and **GypLyner IWL**	Go to page 90 Consider Thistle Durafinish	Go to page 90 Consider Thistle plaster and **GypLyner IWL**
	Aesthetic improvement	Go to page 128 Consider Thistle plaster	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**	Go to page 128 Consider Thistle plaster and **CasoLine MF**	Go to page 128 Consider Thistle plaster and **GypLyner UNIVERSAL**
ACTIV air	Indoor air quality improvement	Go to page 152	Go to page 152	Go to page 152	Go to page 152

For the full range of Thistle plasters, see the Plaster Selector Guide on pages 76 and 77.

Improve

Information in this guide can be used to provide solutions for the complete renewal of existing spaces.

However, British Gypsum has produced specific sector guides to assist understanding and to provide the supporting information required for this type of work.

For healthcare buildings, please consider using The **WHITE** BOOK Health sector guide.

This guide will:

1 Explain the regulatory requirements, and how British Gypsum can help.

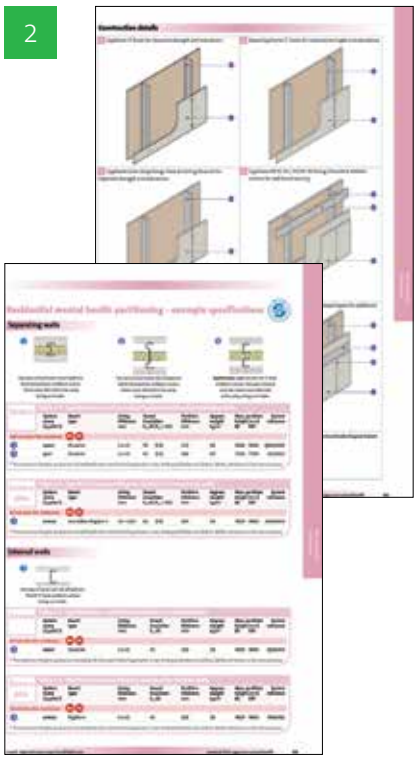
2 Identify and select solutions.

3 Provide support for common details and issues.

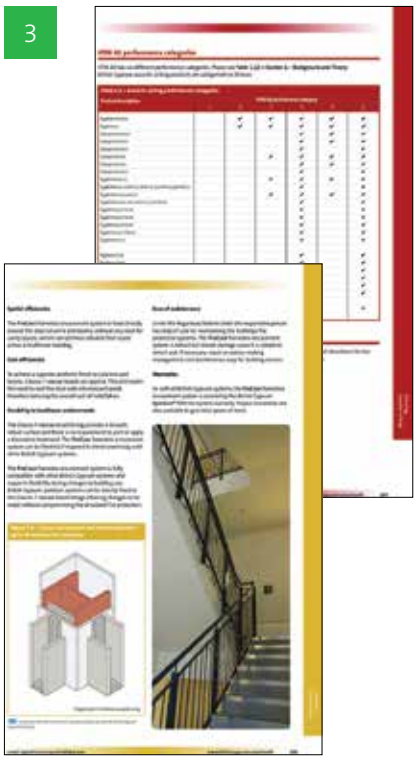
This document can be downloaded for free from the British Gypsum website at www. british-gypsum.com/healthcare

1

2



3




ZARA
ZARA

02

Solutions

Providing the answers for that perfect finish.

Solutions

A guide to help repair, maintain and improve buildings.

Our systems and solutions.

Repair Maintain Improve

The **White Book** Refurbishment Guide outlines a portfolio of plaster, drylining and ceiling systems developed to meet the requirements of a wide variety of projects, from small-scale repair work through to larger maintenance programmes.

We work closely with specifiers, contractors and clients, to ensure that our range of solutions provide consistently high-quality environments that offer the best, whole-life value for money.

It is important to note that the systems, solutions and specifications presented in this guide are intended for guidance purposes only.

Plaster products

Our world leading range of Thistle undercoat and finish plasters are unmatched for quality, consistency and on the wall performance. They provide the workability and high-quality finish preferred by plasterers and building owners throughout the UK.

Plasterboard products

Our Gyproc plasterboard products have been developed over nearly 100 years, providing proven lining solutions that help British Gypsum systems meet the fire, thermal, acoustic, impact and lifetime performance demands of any building.

Metal products

Gypframe metal products provide the structural backbone of all British Gypsum systems. The range of metal studs, channels, angles, brackets and associated components, designed using the unique UltraSTEEL® process, are the widest and highest quality range of metal system components in the industry.

Specialist products

Glasroc **F** and Rigidur **H** specialist boards are unique in providing a range of high performance benefits. They also provide the basis for specialist fire protection, thermal insulation and steel protection systems for a variety of buildings.

Ceiling products

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

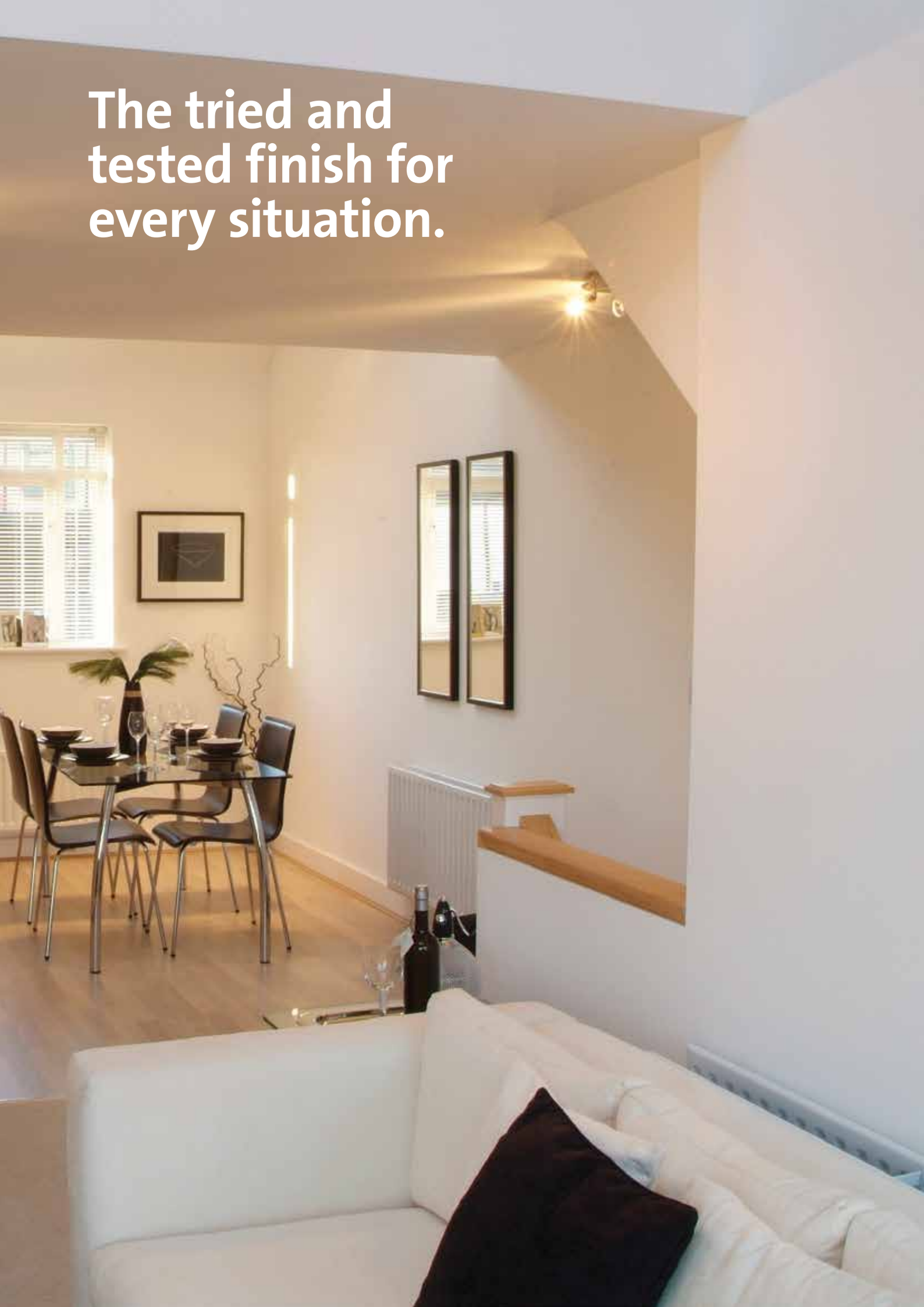
We recommend that this guide should be read in conjunction with relevant Building Regulations Approved Documents (or the Scottish Technical Standards for Scotland) as well as other regulatory and guidance documents such as Building Bulletin 93 and HTM 08-01.

Full design, performance and installation guidance is published in the British Gypsum **WHITE** BOOK and **SITE** BOOK, which can be downloaded from www.british-gypsum.com

In many cases, particularly in maintenance projects, there will be a requirement to demonstrate compliance with Building Regulations or Standards. All our systems are fully supported with test-based performance substantiation.

Further advice on system selection, design guidance, performance data and installation advice is available through our Technical Advice Centre on 0844 800 1991 or email: bgtechnical.enquiries@bpb.com

The tried and tested finish for every situation.



Plasters

Using plaster on walls and ceilings can provide a high-quality, smooth and durable finish. Plaster also seals air gaps making rooms quieter and warmer.

We have plaster solutions for repairing and upgrading damaged surfaces. We specialise in enabling our customers to blend new backgrounds into old and turning rough, unfinished surfaces into pristine walls.

Backgrounds you may encounter

Before 1945, timber lath and plaster was a common method of finishing walls and ceilings. Timber lath is narrow strips of timber plastered with a lime and sand undercoat, then finished with lime putty (see image to the right).

After 1945, timber lath and plaster was largely replaced by plasterboard lath and two coat gypsum plaster for internal partitions. The use of sand and cement undercoats finished with gypsum plaster was also common.

From the 1960s onward, standard plasterboard with gypsum finish plaster applied directly to it was, and is, commonplace.

Did you know?

If repairing a small hole in lath and plaster ceiling, use a metal lath to bridge the gap, seal up the edges of the existing plaster with Thistle GypPrime, then plaster with Thistle Universal One Coat. It's ideal for this purpose and is a process that can also be used for walls.

Damaged plaster finished wall

Repairing walls after removing wallpaper:

Scraping off old wallpaper can leave your walls covered in little scratches that may not look well finished once painted, no matter how many coats you apply. For minor damage, use Gyproc Easi-Fill. Alternatively, to get the perfect smooth finish and future protection you need, re-skim the wall before painting. Simply follow the advice in the 'scratched or scruffy walls and ceilings' section below.

Did you know?

One thing to watch out for, once wallpaper has been removed, is delamination of finish plaster from sand and cement. It's common for the sand and cement undercoat to be very smooth and not provide enough key for the application of a modern gypsum finish plaster. If you encounter this scenario, pre-treat the sand and cement with ThistleBond-it before plastering.

Repairing walls following plumbing or electrical work:

Maintaining electrical fittings and plumbing can often mean having to fill holes left by the electrician or plumber. This can be easily done in two ways. The first option is to fill the gaps with Thistle Bonding Coat, then finish with Thistle Multi-Finish. It is important to ensure high suction areas are pre-treated as required. Alternatively, you can fill the gap with Thistle Universal One Coat, then it can be made smooth, ready for painting.

Repairing scratched or scruffy walls and ceilings:

Over time your perfect painted walls and ceilings will get scuffed and scraped as part of day-to-day use. The best way to return your room to its original pristine condition is to re-skim them using Thistle finish plasters.

Did you know?

It's important to remember to pre-treat your walls and ceilings with ThistleBond-it if they are very smooth and need a mechanical key, or use Thistle GypPrime if the surfaces are very porous and have high suction.

Re-plastering old, crumbly plaster:

In old properties, the original finish plaster may be falling off. To deal with this, completely remove any unstable plaster. Pre-treat dry backgrounds of high suction with Thistle GypPrime. Then finally fill any voids with Thistle Bonding Coat.

Once this is done the surface can be re-skimmed with Thistle Multi-Finish to return it to its intended state.

Replacing debonded plaster:

Loose or debonded plaster sounds hollow when tapped. It can be repaired by cutting back to a solid area and using the solutions in the Thistle Plaster Selector Guide on pages 76 and 77.

Repairing your walls following damp proofing:

You might need to repair plasterwork after the installation of a successful new damp proof course. It is necessary to remove all damaged plaster at least 0.5m above the new damp proof course or any detectable sign of dampness.

The now bare wall can be plastered with Thistle Dri-Coat; this will still allow the wall to dry out, without bringing any salts to the surface as a result of the water damage. The wall can then be finished using Thistle Board Finish, but only once the wall is totally dry.

Busy areas:

In every building there are areas that see more traffic than others, like corridors and stairs. These areas get damaged and start to look scruffy quicker than the rest of the building, they also tend to be the most seen areas of a building. The damage can be avoided by using Thistle Durafinish as it is 60% more durable than standard finish plasters.

Plastering unfinished backgrounds

Plastering onto plasterboard:

In the course of maintaining any property it may be necessary to re-board certain areas or to upgrade dry lined areas to a higher quality finish using skim coat plaster.

Plastering onto plasterboard is straight forward, simply use Thistle Board Finish or Thistle Multi-Finish.

Did you know?

For larger schemes, Thistle Spray Finish can be considered, potentially saving time and effort.

Plastering onto sand and cement:

You may need to upgrade an old sand and cement wall to a higher quality finish.

To do this, simply wet down the sand and cement before skimming with Thistle Multi-Finish. If the sand and cement is very old and dry, it may be necessary to use Thistle GypPrime before plastering.

Plastering onto smooth concrete:

Upgrading a garage, storage area, or other similar spaces can mean that you have to skim smooth concrete walls or ceilings. This can be done by pre-treating the area with ThistleBond-it and skimming with Thistle Multi-Finish. Alternatively, you can apply Thistle Durafinish direct to prepared concrete. To assist with levelling uneven backgrounds, two coat Thistle plaster is advised.

Did you know?

It might be necessary to level uneven concrete with Thistle Bonding Coat before skimming.

Plastering uneven backgrounds

Plastering blocks and bricks:

Upgrading a block or brick wall to a high-quality finish will require the use of an undercoat plaster to level out the surface.

We supply a range of undercoat plasters to suit a wide variety of backgrounds. Refer to the Plaster Selector Guide on pages 76 and 77.

Did you know?

When a Thistle undercoat plaster is level, Thistle finish coat plaster can be applied on the same day.

Plastering uneven concrete:

To upgrade an area of prepared uneven concrete wall to a high-quality finish, it will be necessary to level it with Thistle Bonding Coat before skimming.

These surfaces should also be pre-treated with ThistleBond-it before plastering.

Did you know?

Thistle Bonding Coat can be built up to any thickness using metal lath. For further information, please see the plaster systems section of the **WHITE** BOOK.

Cracks in plaster

Walls with cracks in the plaster:

Cracks due to movement in a building can transfer from the background, through the plaster. Filling or repairing these cracks will not prevent further issues if the building is still moving. Advice should be sourced from a structural engineer.

Minor cracks can be repaired by using Gyproc Easi-Fill, then made smooth and ready for decoration. More severe cracks should be racked out and filled with a Thistle finish coat plaster.

Did you know?

To reduce the risk of cracking in plasterboard joints, paper Gyproc Joint Tape should be used instead of glass fibre.

Did you know?

Thistle Dri-Coat is the only Thistle undercoat you can tile directly onto.

Tiling

Tiles weighing up to 20kg/m^2 can be put directly onto Thistle finish coat plasters. Be careful if you are tiling onto finish plaster that was pre-treated. If it has been, be sure to include the weight of the plaster between the tiles and the pre-treatment in the 20kg/m^2 tally.

Time saving tip:

Thistle plasters can be painted before they are fully dry. If you're using a permeable paint (i.e. most emulsions) it can be applied once the plaster is set, it does not have to be fully dry. This can shorten disruption to a room by days.

Plaster Selector Guide

Undercoat solid plaster

What is the background surface? ← High — suction — Low →

			Aircrete blocks	Common bricks	Medium-density blocks	Dense blocks	Engineering bricks with raked joints	Plasterboard & Glasroc F MULTIBOARD	Cast in situ & pre-cast concrete	Painted / tiled surfaces	Metal lathing	Thickness applied – walls	Thickness applied – ceilings	Coverage per bag hand applied (at 11mm)	Water requirement (litres per bag)	Dry set weight (at 11mm)
Two coat		**Thistle HardWall** High impact resistance for most masonry backgrounds. Can be spray applied				NOT ON SMOOTH LOW SUCTION BLOCKS					WHEN BRIDGING COLUMNS AND LINTELS	11mm	8mm	3.0m²	15	9.3kg/m²
		**Thistle ToughCoat** High coverage for most masonry backgrounds. Can be spray applied[1]				NOT ON SMOOTH LOW SUCTION BLOCKS					WHEN BRIDGING COLUMNS AND LINTELS	11mm	8mm	3.5m²	17.5	8.5kg/m²
		**Thistle Browning** For solid backgrounds with adequate key	G USE IN EXTREME CASES									11mm	8mm	3.5m²	17.5	8.4kg/m²
		**Thistle BondingCoat** For smooth and low suction backgrounds				B USE ON SMOOTH LOW SUCTION BLOCKS		B USE ON MR BOARDS	B	B		11mm	8mm	2.75m²	14	12.1kg/m²
One coat		**Thistle Universal OneCoat** For hand or spray application to most backgrounds				B USE ON SMOOTH LOW SUCTION BLOCKS		B USE ON MR BOARD	B	B		13mm	10mm	2.25m² at 13mm	15	15kg/m² at 13mm

NB Thistle plasters should only be applied to backgrounds where the minimum temperature will remain at 2°C or above until dry.

NB Setting times: Thistle undercoat plasters – 1½ to 2 hours.

Suction control

Thistle GypPrime
Suction control primer used to reduce suction on very dry backgrounds. Use diluted (up to 5 parts water to one part Thistle GypPrime) or undiluted if severe suction control is required. Plaster is applied after Thistle GypPrime has soaked into the background.

G Use Thistle GypPrime where you see this symbol

Bonding agent

Thistle Bond-It
Bonding agent for smooth low suction backgrounds. Apply undiluted, in one coat. Plaster when dry. (Not to be used with Thistle HardWall)

B Use Thistle Bond-It where you see this symbol

Recommended for use

Skim finish plaster

			What is the background surface? High ← suction → Low								
			Dry undercoats	Damp undercoats	Plasterboard	Flat, smooth concrete	Waterproofed cement-based undercoats	Thickness applied	Coverage per bag (at 2mm)	Water requirement (litres per bag)	Dry set weight (at 2mm thickness)
Essential finish		**Thistle MultiFinish** A versatile plaster for skim finishing undercoats and plasterboards	DAMPEN BACKGROUND FIRST		B USE ON MR BOARDS	B		2mm	10m²	11.5	3.4kg/m²
		**Thistle BoardFinish** For low to medium suction backgrounds especially plasterboard			B USE ON MR BOARDS	B		2mm	10m²	11.5	3.4kg/m²
		**Thistle SprayFinish** Gypsum finish plaster for spray or hand application			B USE ON MR BOARDS	B		2mm	11m²	12	2.4kg/m²
Performance finish		**Thistle DuraFinish** A versatile plaster that is 60% tougher than standard skim plasters	G	G				2mm	10m²	12	3.4kg/m²
		**Thistle PureFinish** Finish plaster containing **ACTIV*air*** technology for finishing undercoat plasters and plasterboard	DAMPEN BACKGROUND FIRST		B USE ON MR BOARDS	B		2mm	10m²	11.5	3.4kg/m²
		**Thistle UniFinish**[1] The plaster that works without PVA	G					2mm	11m²	12	2.4kg/m²

NB Thistle plasters should only be applied to backgrounds where the minimum temperature will remain at 2°C or above until dry (except for Thistle DuraFinish which should remain at 5°C or above until dry).

NB On flat surfaces, 2mm is recommended. If the surface is very uneven, consider dubbing it out with an undercoat.

Specialist plasters

Thistle Magnetic Plaster
A Thistle plaster that attracts magnets leaving a quality surface for internal walls and a durable base for applying decorative finishes. Can be used to finish a wide range of backgrounds, including undercoat plasters and plasterboard. A minimum of 3mm thickness should be applied and coverage is 5.1m² per bag.

Thistle DriCoat
Cement based plaster for replastering after a damp proof course. Finished with Thistle BoardFinish.
Coverage is 3.25m² per bag.

[1] See **british-gypsum.com/thistle-unifinish** for full details.


We live and
breathe stunning
results everywhere.
On every wall,
on every ceiling.

Repair: Surface damage

The surface of a partition, lining or ceiling can be constructed using many different materials.

Whilst no guidance is included for aesthetic finishes, such as paints or wallpapers, this section will help to explain how to repair common plaster finishes.

It is worth keeping in mind that if the plaster work or repair job is poor, then the decorative finish can be affected.

Smooth, well finished plaster work and good repairs to any surface damage of plaster and plasterboard can make all the difference to a room.

Did you know?

Small areas of minor damage and wear to walls and ceilings can be easily repaired using Gyproc Easi-Fill; an ideal filler prior to redecoration.

For larger areas, using Thistle Plaster skim finishes gives a high-quality surface finish, providing the look and feel of a new room.

Light damage to plaster or plasterboard

Scuffs and scrapes can leave surfaces looking worn and poorly maintained.

Preparation

– Ensure all loose material and dust is removed.
– If plasterboard, cut away any damaged paper liner back to the core.

Action

– Apply Gyproc Easi-Fill and scrape back to surface level.
– After drying (approximately 24 hours), sand back to a smooth finish.
– Redecorate as required.

Delamination of finish plaster (through impact)

Old plaster can lose adhesion with its background. Where this is the case, it is often better to remove the existing plaster and re-skim. Severe impacts can cause plaster to be knocked loose:

Preparation

– Consult the Plaster Selector Guide on pages 76 and 77 to ensure you use the right product, considering key and background suction.
– Ensure all loose material and dust is removed back to a stable surface.
– Remove all surface contaminants e.g. grease, release agent, etc.
– Pretreat the background with Thistle GypPrime or ThistleBond-it as required.

Action

– Apply Thistle finish plaster as normal ensuring the final thickness matches the surrounding surfaces.
– Redecorate as required.

Damage to two coat plaster on solid backgrounds

Damage can be caused in a number of ways, from adhesion/bond failures and cracking to flooding or impact damage.

Where the cause of cracking is stable, and the plaster is still adhered, see page 75, otherwise:

Preparation

– Consult the Plaster Selector Guide to ensure you use the right product, considering key and background suction (see pages 76 and 77).
– Ensure all loose material and dust is removed back to a stable surface.
– Where multiple layers are required, consider 'stepping' the edge of the existing plaster.
– Remove all surface contaminants e.g. grease, release agent, etc.
– Pretreat the background with Thistle GypPrime or ThistleBond-it as required.

Action

– Apply Thistle undercoat plaster as normal ensuring the final thickness matches the surrounding surfaces.
– Apply Thistle finish plaster as normal, tight to the existing plaster.
– Redecorate as required.

For more information on repairing plaster see from page 71.

Damage of two coat plaster on metal lath

Plaster spanning voids or combination backgrounds is carried on metal lath.

Preparation

– Consider re-fixing with galvanised metal lath and extending over composite backgrounds.
– Ensure all loose material and dust is removed back to a stable surface.

Action

– Consider treating the edges of the existing plaster for suction with Thistle GypPrime.
– Apply Thistle Bonding Coat plaster as normal ensuring the final thickness matches the surrounding surfaces.
– Apply Thistle finish plaster as normal, tight to existing plaster.
– Redecorate as required.

Existing timber lath ceilings

Traditionally plaster was installed onto timber lath. Due to differential expansion and loadings, it is not best practice to replaster these backgrounds. For minor repairs consider the following:

Preparation

– Remove timber lath back to the centre line of the nearest joist.
– Insert noggings for any unsupported edges.

Action

– Inlay with plasterboard, fixing securely through to the supporting framework, e.g. joists.
– Consider treating the edges of the existing plaster for suction with Thistle GypPrime.
– Apply Thistle Bonding Coat plaster as normal, including pricking-up coat, ensuring a key for the finish plaster (considering thickness of each layer to ensure that adequate space is left for the finish coat to match existing thickness).
– Apply Thistle finish plaster as normal, tight to existing plaster.
– For large area repairs, it may be more prudent to install a new ceiling. Further details of this can be found in the **WHITE** BOOK.
– Redecorate as required.

Complete systems and outstanding products.

Repair: Plasterboard on a frame

If plasterboard is damaged, identifying the amount of damage and then the type of board is key to making a good repair.

If the damage only affects the finish or paper lining of the board, please see the 'Surface damage' section on page 78. However, should the plasterboard core become damaged, the following guidelines are offered.

Assess the degree of damage

- Identify the extent of the damage. This allows the full repair to be planned out before commencing the job and helps prevent further delay.
- Isolate services in the cavity.

Determine boarding type

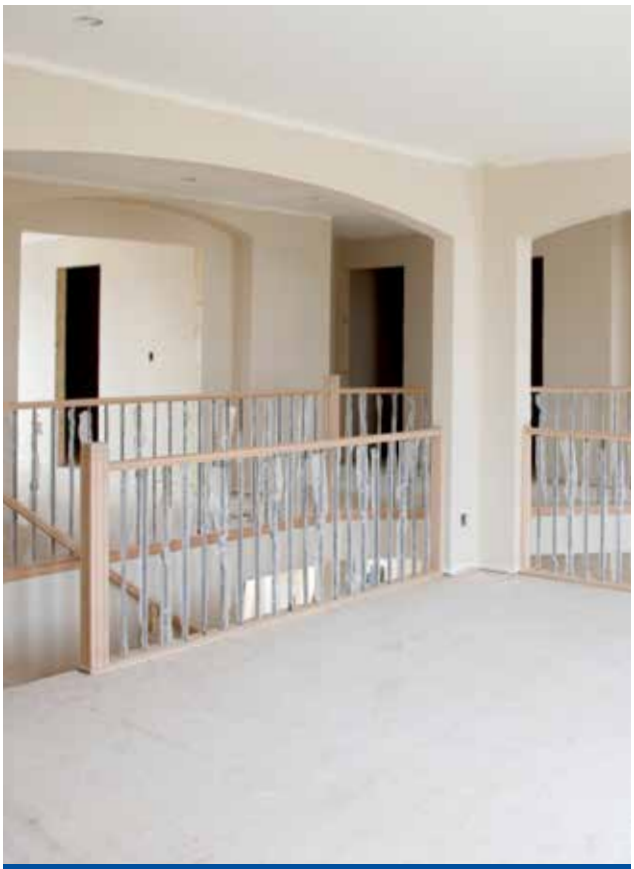
The damaged board should always be replaced with the same board type to ensure that the performance is maintained.

Plasterboards

With Gyproc boards, the plasterboard type is written on the back of the board, however, the following points can be used in the majority of cases to identify boards:

- Board thickness can be determined by measuring through a section
- Board type can be assessed through face colour:
  - Ivory Gyproc WallBoard or Gyproc DuraLine
  - Blue Gyproc SoundBloc or Gyproc SoundBloc **F**
  - Pink Gyproc FireLine
  - Green Gyproc Moisture Resistant

It is worth noting that in some cases one board can solve more than one problem. Gyproc DuraLine combines the best performance of Gyproc FireLine and Gyproc SoundBloc in one board.



Did you know?

GypWall CLASSIC partitions are cost-effective, multi-purpose partitions, which have been the industry standard for many years. They are suitable for all types of buildings, including residential, healthcare and commercial and are approved for use in hospitals by the Department of Health and the Welsh Office (refer to HTM 56, Partitions).

Thermal laminates

Thermal laminate boards are made up of insulation bonded to the back of a plasterboard. Many thicknesses and types of both board and insulation are present in the marketplace.

There are a number of combinations available, and so it is important to identify the correct product. An overview of British Gypsum's Gyproc ThermaLine range can be found on page 124 in the 'Thermal solutions' section.

Taking a product sample to your local builders merchant can often enable an accurate identification.

Identify board layers and supporting frame

- Most constructions are one or two layers per side, and damaged board in either layer will need replacing.
- Locating the studs, and knowing the type, provides an understanding of how far to strip back and which materials are required.

Cut away defective plasterboard

- Remove plasterboard back to the centre line of the nearest studs.
- To ensure performances are maintained, layers of plasterboard need to be staggered.

Correct framework

- Check existing framework supports for damage, and replace or reinforce damaged components.
- Insert Gypframe GFS1 Fixing Strap or timber nogging supports to the perimeter of the replaced areas.

Re-boarding

- Re-board the area with a matching type and thickness of performance plasterboard. Fix with appropriate British Gypsum screws at centres to match the original installation.

Complete surface finish

- Reinforce plasterboard joints using Gyproc Joint Tape.
- Complete applications with Thistle finish plasters or Gyproc jointing compounds.
- For more information see the 'Surface damage' section on page 78.

Perfect boards mean perfect walls and ceilings.

Repair: Plasterboard on adhesive

When damage occurs to plasterboard that has been bonded to a masonry wall, it is important to assess the extent of the damage and the board type to make a good repair.

In cases where the damage only affects the finish or paper lining of the board, refer to the 'Surface damage' section on page 78.

Should the plasterboard core become damaged, the following guidelines are offered.

Assess the degree of damage

- Identify the extent of the damage. This allows the full repair to be planned out before commencing the job and helps prevent further delay.
- Isolate services in the cavity.

Determine board type

The damaged board should always be replaced with the same board type to ensure that the performance is maintained.

Plasterboards

With Gyproc boards, the type of board is written on the back of the board, however, the following points can be used in the majority of cases to identify board type:

- Board thickness can be determined by measuring through a section
- Board type can be assessed through face colour:
  - Ivory Gyproc WallBoard or Gyproc DuraLine
  - Blue Gyproc SoundBloc or Gyproc SoundBloc **F**
  - Pink Gyproc FireLine
  - Green Gyproc Moisture Resistant

If you're looking for a board that can provide fire resistance and excellent acoustics results, then Gyproc DuraLine combines the best performance of Gyproc FireLine and Gyproc SoundBloc in one board.

Did you know?

Thermal laminates, such as Gyproc ThermaLine **PIR** are great for topping-up existing insulation; they're especially good for loft conversion constructions and are the most viable insulation solution for the UK's 7 million older solid-walled homes – one of our biggest insulation challenges.

Thermal laminates give the best of both worlds; insulation and a new high quality lining, fitted together. They are simple to fit using Gyproc Dri-Wall Adhesive systems and cost effective, keeping rooms warm in the winter and cool in the summer. For more loft conversion solutions, go to page 132.

Thermal laminates

Thermal laminate boards are made up of insulation bonded to the back of a plasterboard. Many thicknesses and types of both board and insulation are present in the market place.

There are a number of combinations available, and so it is important to identify the correct product. An overview of British Gypsum's Gyproc ThermaLine range can be found from page 122 in the 'Thermal Solutions' section.

Taking a product sample to your local builders merchant can often enable an accurate identification.

Cut away defective plasterboard and adhesive

- Remove plasterboard back to the undamaged area.
- To secure new plasterboard, any remaining adhesive must be removed from the area to be replaced.

Identify type of adhesive

- There are two common systems used.
  The most common is dot and dab using large dabs of Gyproc Dri-Wall Adhesive, the other is DriLyner RF using small blobs of Gyproc Sealant.

Support edges

- Before re-boarding it is best practice to apply a continuous ribbon of adhesive to support the board joints.

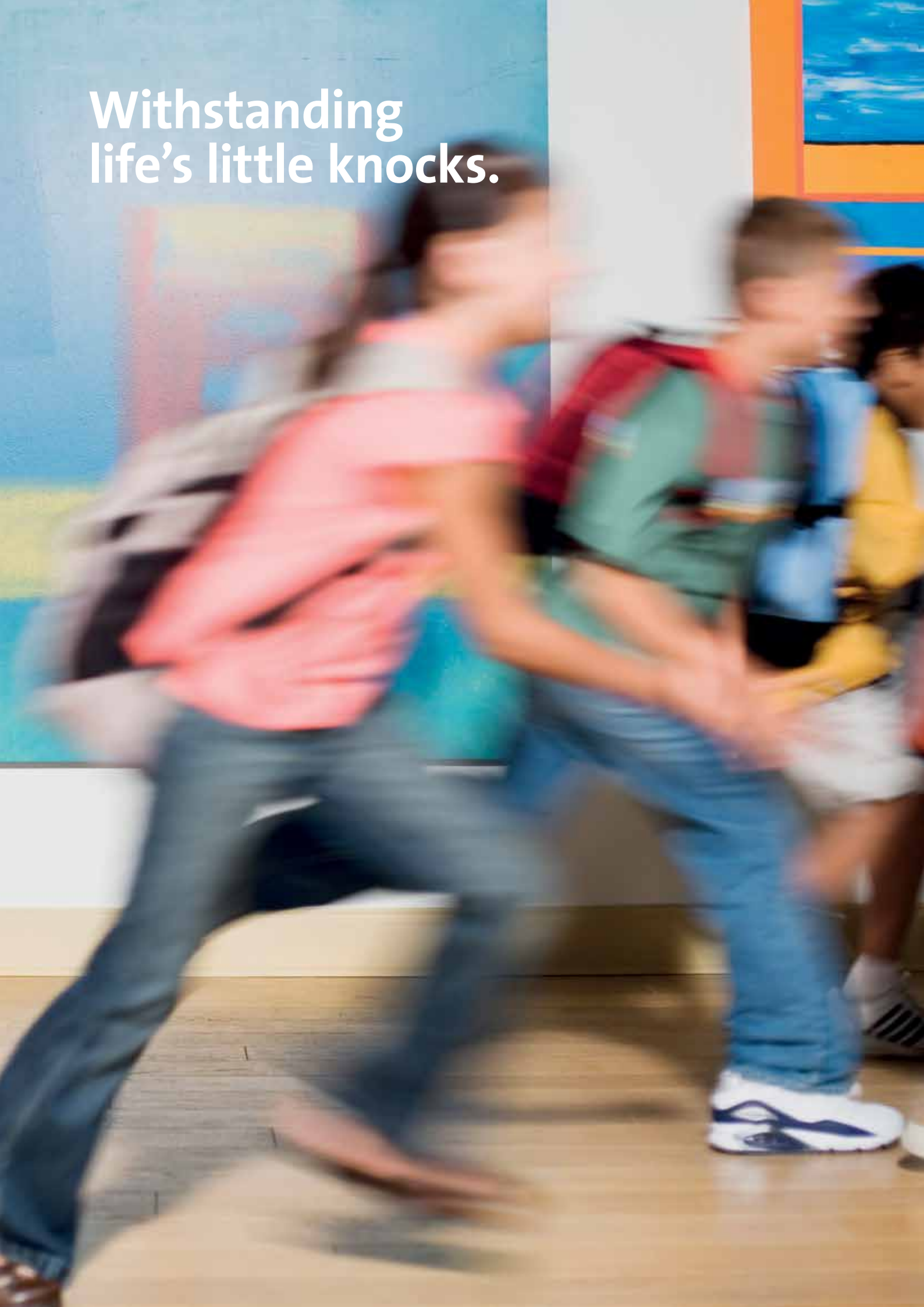
Re-boarding

- Re-board the area with a matching type and thickness of board, fix with the appropriate British Gypsum adhesive to match the original installation, ensuring that the level of the surrounding area is maintained.

Complete surface finish

- Reinforce board joints using Gyproc Joint Tape.
- Complete applications with Thistle finish plasters or Gyproc jointing compounds.

Withstanding life's little knocks.

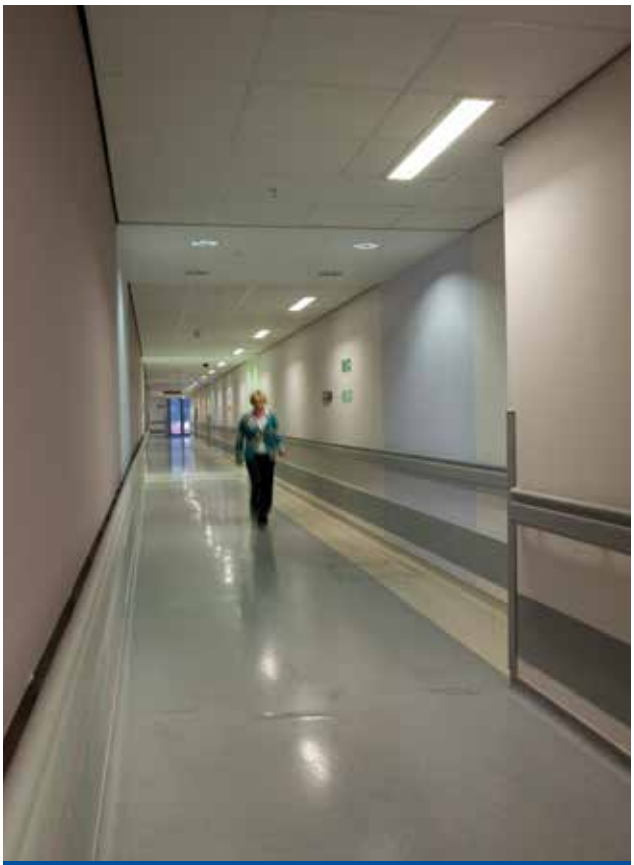


Impact resistance

All buildings are prone to damage. From concert halls to hospitals, living rooms to school corridors.

Upgrading a wall to resist knocks and scrapes can save money over a period of time by reducing maintenance cycles and making repairs cheaper and easier to complete.

The following section is designed to help explain the ways current constructions can be improved. Damage resistance can be considered in two ways, either the visible wear and tear of walls and partitions, or the British Standard that sets a classification system.



Did you know?

Whilst BS 5234 defines duty rating standards, sometimes situations require a stronger partition. This partition should withstand impacts without becoming damaged, resist water without bowing and create acoustic separation and future proofing of layout by allowing enhanced fixing capabilities. For this reason, British Gypsum offers Glasroc Rigidur **H**.

Two coat Thistle plasters

Plaster forms a direct connection to the background, therefore all impacts are transferred into the main construction. This enables greater impact tolerance and any resulting damage can be significantly reduced.

Thistle Durafinish

Thistle backing plasters can be enhanced by using Thistle Durafinish as a skim finish. It is up to 60% more resistant than standard gypsum plaster.

Test 1 glancing damage

This highly realistic test was created by our experts specifically to simulate a glancing blow, no standard test being available. We were able to control the speed and impact of a trolley, selecting an impact which, in one go, was able to go right through the Thistle Multi-Finish to the plasterboard beneath. The same damage on Thistle Durafinish got less than halfway through the plaster.

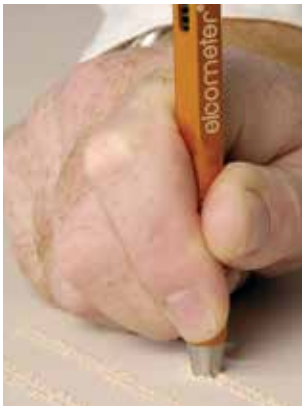
Did you know?

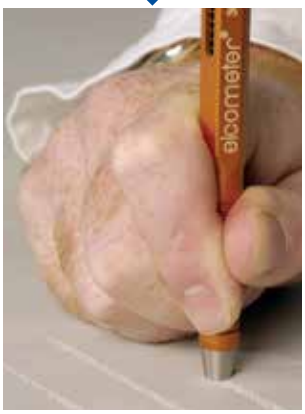
Thistle Durafinish is ideal for busy, hardworking buildings that are subjected to high levels of scrapes and bangs on a daily basis. It delivers consistently excellent results in homes, schools, offices and hospitals, keeping buildings fresher for longer.

Test 2 scratch resistance: elcometer

This is a standard test using a loaded point which produces the same scratch repeatedly.

Thistle Durafinish is up to **60%** more resistant to damage than standard gypsum plaster.





For more information on plasters turn to the Plaster Selector Guide on pages 76 and 77.

Partitions

Partition systems are commonly used to achieve performances such as acoustic and fire compartmentation. They can also be used as aesthetic divisions and a thermal barrier.

GypWall CLASSIC, ROBUST and EXTREME

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

GypWall ROBUST is a high damage-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.

GypWall EXTREME is British Gypsum's ultimate impact resistant partition system for use where extra durability is required above and beyond Severe Duty. **GypWall EXTREME** is able to cope with the rigours of intensive high traffic in commercial, education and regular use areas.

Thistle Durafinish is the ideal partner for Rigidur H when a skim finish is desired. It combines the excellent abrasion and dent resistance benefits of Rigidur H with the attractive and seamless finish of plaster.

Damage resistance is classified by BS 5234 Parts 1 and 2. In basic terms, this document outlines 4 standards of Duty Rating, explains the room types they're appropriate for and then defines the testing methods and requirements for each rating.

Partition duty	Category	Examples
Light	Adjacent space only accessible to persons with high incentive to exercise care. Small chance of accident occurring or misuse.	Domestic accommodation
Medium	Adjacent space moderately used, primarily by persons with some incentive to exercise care. Some chance of accident occurring or misuse.	Office accommodation
Heavy	Adjacent space frequently used by the public and others with little incentive to exercise care. Chance of accident occurring 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 testing criteria mean that each board can be considered to have its own rating when formed in a full British Gypsum system. For a single board to either side the following ratings are achieved:

Board type	Maximum rating
Gyproc WallBoard 12.5mm	Medium
Gyproc WallBoard 15mm	Medium
Gyproc SoundBloc 12.5mm	Medium
Gyproc FireLine 12.5mm	Medium
Glasroc H **TILEBACKER** 12.5mm	Medium
Gyproc SoundBloc 15mm	Heavy[1]
Gyproc FireLine 15mm	Heavy
Gyproc SoundBloc 12.5mm	Heavy
Glasroc F **MULTIBOARD** 10mm	Heavy
Glasroc F **MULTIBOARD** 12.5mm	Severe
Gyproc DuraLine 15mm	Severe
Rigidur H 12.5mm/15mm	Severe

[1]Minimum Gypframe 70mm Stud for Heavy Duty

Did you know?

It is important to select a British Gypsum door frame detail that is suitable for the demands of BS 5234 Heavy and Severe Duty tests.

Wall linings

Whilst BS 5234 classifies duty ratings for partitions, it also applies to matching linings and so the same performance can be considered for Gyproc and Glasroc boards installed onto the following systems.

Where a cavity is needed to contain services or correct a background that is out of true, the following solutions are advised:

GypLyner IWL

GypLyner IWL independent wall lining is a lightweight, non-loadbearing system, which is built independently of the external wall construction.

The lining can be used in association with new or existing masonry walls to increase sound insulation and meet thermal performance requirements.

GypLyner UNIVERSAL

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. It provides a void of 25mm-125mm for service management and to allow for uneven backgrounds.

Did you know?

British Gypsum **GypLyner UNIVERSAL** and **IWL** wall lining systems are perfect for concealing cables and pipes. From home cinema cabling to drainage pipes, these systems offer the best solutions in the market for a pristine installation.

Controlling unwanted noise.

Acoustic upgrades

A noisy space can be unpleasant and potentially unusable at times. Controlling sound should be a consideration when looking at a building's use. If its use is changing, this becomes more critical.

A range of regulations exist to create minimum standards for the travel and volume of noise that can be expected within and between buildings.

Sound can be considered and measured in a number of ways.

Sound insulation

Sound insulation is the term used to describe the reduction of sound that passes between two spaces separated by a dividing element.

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.

Did you know?

Gyproc SoundBloc board and Isover insulation within **GypLyner IWL** or **GypLyner UNIVERSAL** systems can be used to acoustically upgrade an existing masonry wall. You could also use Gyproc TriLine fixed by the **DriLyner SI** or **DriLyner RF** system. The choice of solution depends on a number of factors, such as type of background, height of lining and performance requirements and board type.

Gyproc SoundBloc is also designed to be used in our British Gypsum wall partitions and ceiling systems; it is ideal for where greater levels of sound insulation are required.

Sound insulation

When sound travels between two spaces, it can pass through the dividing element (direct transmission) or through the surrounding structure (indirect or flanking transmission). It is important to consider both methods of transmission.

Airborne sound

Sound travelling through the air from a source, through a dividing element, to a receiver. The higher the number, the better the performance.

R_w dB

This is a single figure method of rating. It is used for laboratory airborne sound insulation tests. The figure does not consider any flanking paths and is known before construction.

D_{nTw} dB or D_{nTw} (T_{mf} Max) in education

This is a single figure method of rating. It is used for site-based tests. The result achieved is affected not only by the separating element, but also by the surrounding structure and junction details.

Ctr

This is an adaptation term to include the low frequency performance. It can be used with an R_w dB or D_{nTw} dB. The term has been adopted within AD E for England and Wales. It is considered in residential situations.

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

Every building type and every situation has different requirements, e.g. room relationship or size. The following offers commonly specified performance levels:

- R_w 40dB – the requirement for residential internal walls and floors.
- R_w 52dB – a typical, higher performing partition in commercial situations.
- R_w 61dB (R_w + Ctr 52dB) – a typical level for well-detailed separating walls in residential situations.

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. Air leakages through unsealed gaps, such as sockets, are also important to control.

Impact sound

Noise created when impacting on the dividing element (typically a floor).

The lower the dB number, the better the performance.

L_{nw} dB

This is a single figure method of rating. The figure indicates the amount of sound energy being transmitted through the floor, tested in isolation. The figure does not consider any flanking paths and is known before construction.

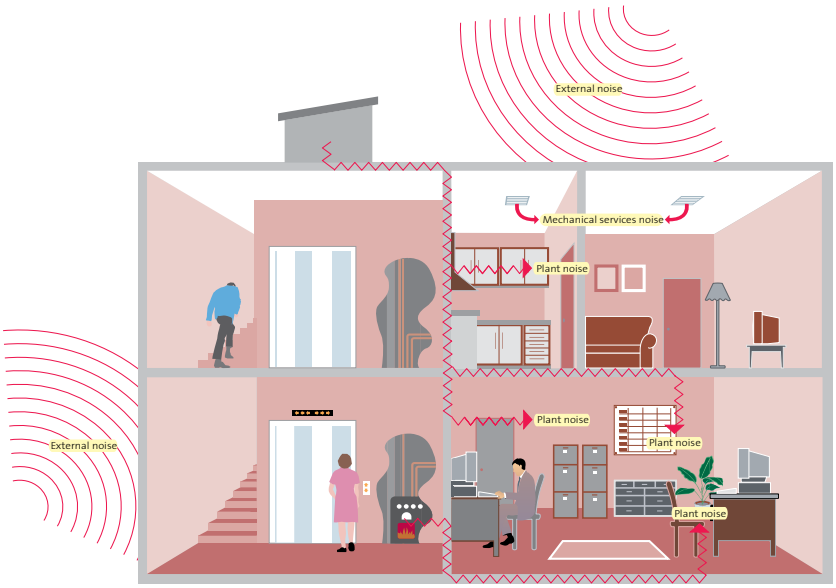
L_{nTw} dB

This is a single figure method of rating. It is used for site-based tests. The result achieved is affected not only by the separating element but also by the surrounding structure and junction details.

Did you know?

In HTM08-01, specifying a Class C absorbent or better on ceilings, potentially reduces the performance requirement of the partitions by up to 3dB.

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.



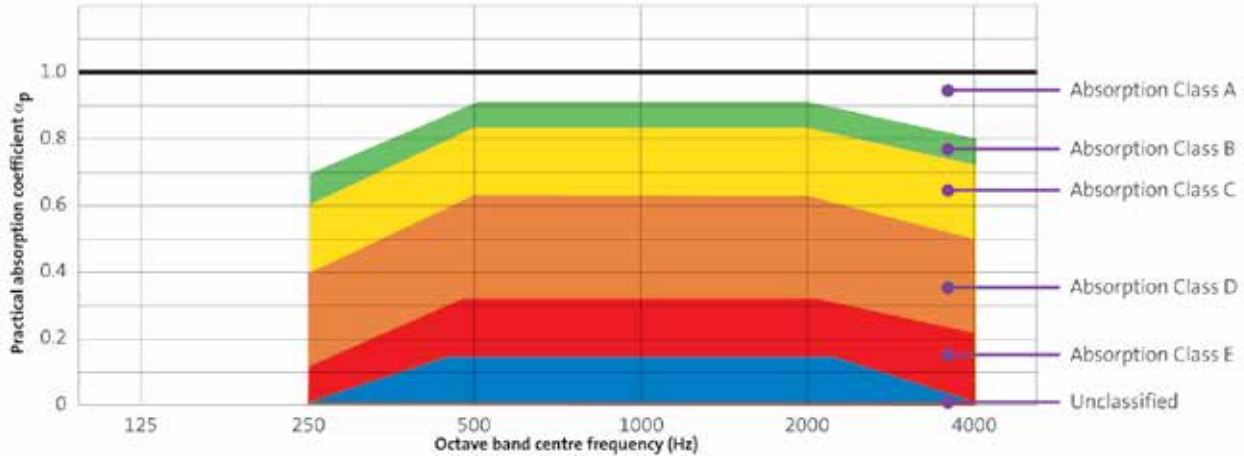
Sound absorption

Reverberation, or reverb, is created when a sound is produced in an enclosed space without sufficient absorbing materials. This causes a large number of echoes to build up and then slowly dissipate. If this is not managed appropriately it will negatively affect speech clarity.

This issue is regulated in a number of building types, including:

- Building Regulations Approved Document E (AD E) – Residential Buildings.
- BB93 – Building Bulletin 93: Acoustic design of schools.
- Health and Technical Memorandum HTM 08-01 Acoustics – Healthcare Buildings.

There are multiple ways of calculating ratings and assessing this issue. The most common method used is by comparing material's absorption characteristics using the following chart.



Did you know?

It is necessary to design the space using a mixture of sound reflective and sound absorbing surfaces.
For more information, please see page 142 for 'Ceiling solutions'.

Thistle plasters

A common cause of sound insulation problems with masonry walls is leakage through joints and gaps in the wall. Thistle plasters provide a simple and robust sealing method upgrading the walls acoustically whilst also improving the air tightness performance.

The British Standard BS EN 13914-2:2005 states:

"Direct plastering is the most effective way of providing air tightness for masonry walls."

Creating new spaces

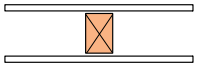
GypWall CLASSIC and timber stud partitions

GypWall CLASSIC is the industry's original lightweight drywall partition system. It provides cost effective, multi-purpose solutions suitable for all types of buildings. It can also achieve a range of acoustic performances up to R_w 61dB.

This simple system can achieve acoustic performances at a variety of partition heights, fire performances and duty ratings.

Stud sizes vary in section and width (from 48mm to 146mm).

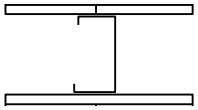
1



(Images not to scale)

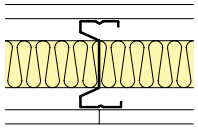
One layer of board each side of 63mm x 38mm timber studs at 600mm centres. 25mm Isover APR 1200 in the cavity. Lining as in table.

2



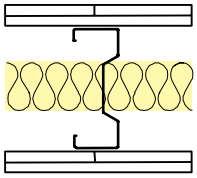
One layer of board each side of 70mm Gypframe 'C' Studs at 600mm centres. Lining as in table.

3



One layer of board each side of 92mm Gypframe AcouStuds at 600mm centres. 50mm Isover Modular Roll in the cavity. Lining as in table.

4



Two layers of board each side of 146mm Gypframe 146 AS 50 AcouStuds at 600mm centres. 50mm Isover APR 1200 in the cavity. Lining as in table.

Detail	Partition thickness mm	Board type	Lining thickness (mm)	Max. partition height (mm)	Sound insulation R_w dB (R_w + Ctr dB)	Duty rating	Approx. weight (kg/m²)	System reference
30 minutes fire resistance BS 476: Part 22: 1987								
1	88	Gyproc SoundBloc	1 x 12.5	–	40	–	–	A026009
2	97	Gyproc SoundBloc	1 x 12.5	3600	40	Medium	22	A206164
60 minutes fire resistance BS 476: Part 22: 1987								
3	122	Gyproc DuraLine	1 x 15	4900	52	Severe	30	A206A279
90 minutes fire resistance BS 476: Part 22: 1987								
4	208	Gyproc SoundBloc	2 x 15	8100	61(56)	Severe	52	A206A243

Upgrading existing spaces

GypLyner IWL

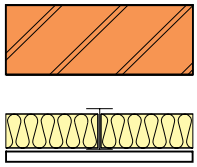
GypLyner IWL independent wall lining is a lightweight, non-loadbearing system, which is built independently of the external wall construction.

The lining can be used in association with existing masonry walls to increase sound insulation and meet thermal performance requirements.

As this system requires the stud to be suitably rigid, the table below shows maximum heights based on the standard 600mm stud centre.

NB Based on a limiting deflection of L/240 at 200 Pa. Greater heights can be achieved by reducing stud centres. For heights between 4200mm and 8000mm, Gypframe Deep Flange Floor & Ceiling Channel should be used at base and at head (subject to deflection criteria).

Single or double layer board to one side of Gypframe 'I' Stud framework and 50mm Isover Steel Frame Infill Batts, forming an independent lining to masonry construction. Linings as in table.



Stud type	12.5mm boards maximum height		15mm boards maximum height	
	single mm	double mm	single mm	double mm
48 I 50	2400	2700	2400	2800
60 I 50	2400	3000	2700	3300
60 I 70	3000	3600	3300	3900
70 I 70	3600	4200	3900	4300
92 I 90	5100	5700	5400	6000
146 I 80	6900	7200	7200	7500

Board type	Lining thickness (mm)	Sound insulation R_W dB[2]	Duty rating	Approx. weight (kg/m²)	System reference
180 minutes fire resistance[1]	BS	**476: Part 22: 1987**			
Gyproc WallBoard	1 x 12.5	59	Medium	11	B216001
Gyproc WallBoard	2 x 12.5	61	Severe	20	B216031

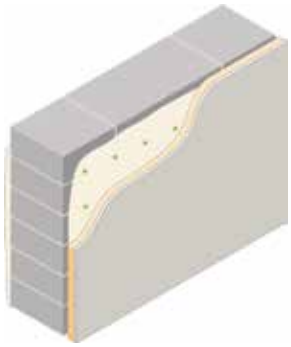
[1] The fire resistance quoted is that provided by the masonry wall without contribution from the lining.
[2] Based on masonry element (circa 180kg/m²) achieving R_W 45dB prior to lining, and with a 10mm cavity between masonry and back of metal framing.

DriLyner RF

To save floor space, this is the thinnest way to stick Gyproc thermal laminate to a background.

It creates a circa 2mm cavity requiring an accurate background to follow.

Gyproc Sealant requires a smooth and firm background, such as existing plaster, to ensure a good bond.



Detail	Block density kg/m²	Board type	Lining thickness mm	Laboratory sound insulation		Applied to	DriLyner system	System reference
				Airborne R_W (R_W + Ctr) dB	Improvement over basic wall R_W (R_W + Ctr) dB			
(1)	2000	Gyproc TriLine	52	60 (53)	+13 (+9)	One side	RF/SI	B160018

NB The **DriLyner RF** system is used where existing plaster is retained. The **DriLyner SI** system is used where it is removed.

NB The sound insulation performances are for imperforate walls incorporating boards with all joints taped and filled, or skimmed according to British Gypsum's recommendations. The quoted performances are achieved only if British Gypsum components are used throughout, and the Company's fixing recommendations are strictly observed. Any variations in the specifications should be checked with British Gypsum.

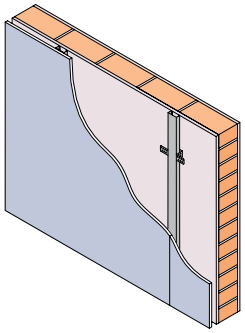
GypLyner UNIVERSAL

GypLyner UNIVERSAL wall lining system is a cost effective, metal frame drylining, that is virtually independent of the background.

It is a general purpose system, suitable for all internal non-loadbearing applications.

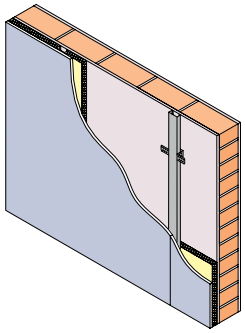
It provides a void of 25mm-125mm for service management and to allow for uneven backgrounds.

1



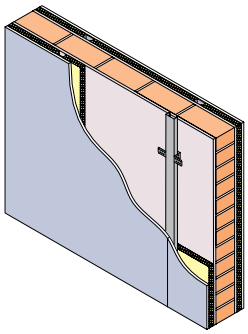
Solid brick wall (103mm) with 13mm plaster each side and Gypframe GL1 Lining Channel framework fixed to one side to give 35mm cavity. Lining as in table.

2



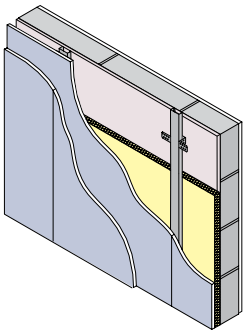
Solid brick wall (103mm) with 13mm plaster each side and Gypframe GL1 Lining Channel framework fixed to **one** side to give 35mm cavity. Cavity filled with 25mm Isover APR 1200. Lining as in table.

3



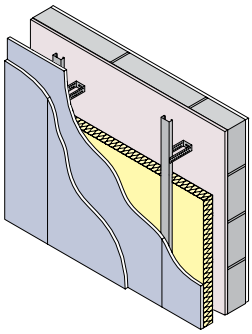
Solid brick wall (103mm) with 13mm plaster each side and Gypframe GL1 Lining Channel framework fixed to **both** sides to give 35mm cavity. Cavities filled with 25mm Isover APR 1200. Lining as in table.

4



Solid brick 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. Lining as in table.

5



Solid brick 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. Lining as in table.

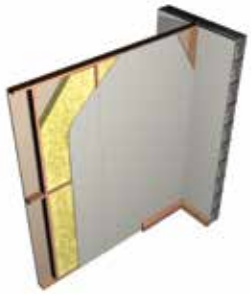
Detail	Board type	Lining thickness (mm)	Sound insulation R_w dB		System reference
			R_w (R_w + Ctr) dB	Improvement over existing wall R_w (R_w + Ctr) dB	
1	Gyproc SoundBloc	1 x 12.5	49 (43)	+2 (-1)	B226009
2	Gyproc SoundBloc	1 x 12.5	57 (50)	+10 (+6)	B226008
3	Gyproc SoundBloc	1 x 12.5	60 (42)	+13 (-2)	B226010
4	Gyproc SoundBloc	1 x 12.5	57 (50)	+10 (+6)	B226008
4	Gyproc SoundBloc	2 x 12.5	60 (55)	+13 (+11)	B226003
5	Gyproc SoundBloc	1 x 12.5	64 (56)	+17 (+12)	B226007
5	Gyproc SoundBloc	2 x 12.5	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, or skimmed according to British Gypsum's recommendations. The quoted performances are achieved only if British Gypsum components are used throughout, and the Company's fixing recommendations are strictly observed. Any variations in the specifications should be checked with British Gypsum.

Non-loadbearing timber stud

Remedial treatment on one side of existing plasterboard partition. This comprises a minimum 12.5mm plasterboard each side of 75 x 38mm timber studs, at 600mm centres.

Fix 50 x 50mm timber battens at 600mm centres and locate 50mm Isover Acoustic Partition Roll (APR 1200) between the battens. Fix Gypframe RB1 Resilient Bar horizontally to the battens, at 600mm vertical centres and line with 2 x 15mm Gyproc SoundBloc.



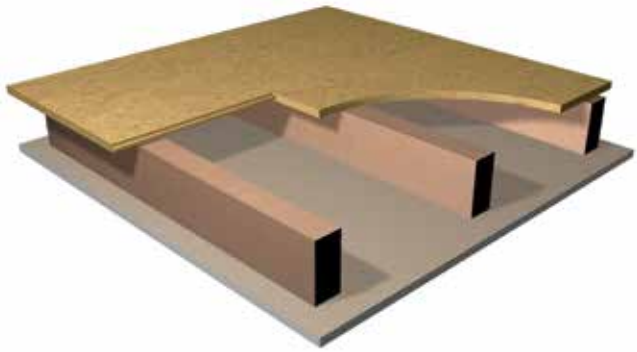
Partition thickness mm	Board type	Lining thickness mm	Stud size mm[1]	Sound insulation R_w
60 minutes fire resistance BS				
196	Gyproc Soundbloc	2 x 15	75 x 38	52

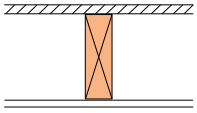
[1]Stud sizes quoted are minimum.

Ceilings and floors

Timber joist floors

If the existing floor boards and joists are to be retained, the simplest solution for a floor is to board the underside of the joist.





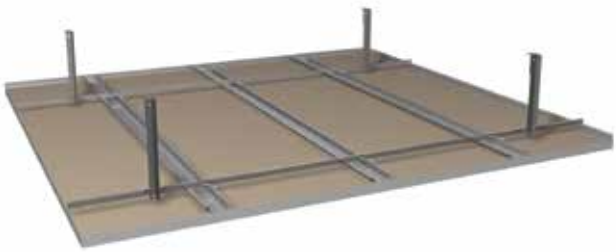
22mm t&g (softwood or chipboard) floor boarding over minimum 195mm x 38mm timber joists at 600mm centre.

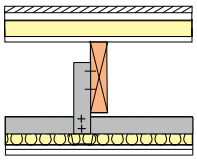
Nominal floor depth	Board type	Ceiling lining thickness mm	Noggings required at perimeter	Maximum loadbearing ratio	Sound insulation		System reference
					R_w Airborne dB	L_{nw} Impact dB	
30 minutes fire resistance BS **476: Part 21: 1987**							
232	Gyproc WallBoard	1 x 15	Yes	100%	40	–	C106029

CasoLine MF

This is a solution that provides a way to upgrade the fire performance of a floor/ceiling and the sound performance at the same time. This system will get the fire performance up to 120mins.

This system also provides lots of space for ventilation ducts and other services by creating a new ceiling void.





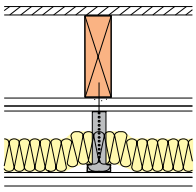
New floating floor laid over joists. **CasoLine MF** ceiling suspended beneath 195mm x 45mm timber joists at 600mm centres to give 277mm cavity. 100mm Isover Spacesaver Ready-Cut laid on ceiling boards.

Board type	Ceiling lining thickness mm	Approx weight kg/m²	Floor depth mm	Sound insulation		System reference
				R_w (R_w +Ctr) dB	L_{nw} dB	
60 minutes fire resistance BS **476: Part 21: 1987**						
Gyproc SoundBloc	2 x 15	27	381	66 (54)	50	C106025

GypLyner UNIVERSAL ceiling

When the existing ceiling is to be retained, this is a solution that provides a way to upgrade the sound performance of a floor construction and the fire performance at the same time.

This system can get the fire performance up to 60mins.

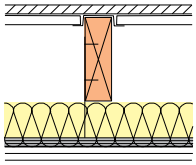


18mm flooring grade chipboard and ceiling of Gyproc Plank and 12.5mm Gyproc WallBoard to simulate a wood lath and plaster ceiling. **GypLyner UNIVERSAL** ceiling suspended with Gypframe GL1 Lining Channels at 450mm maximum centres to give a minimum cavity of 50mm to a maximum of 145mm. 50mm Isover APR 1200 in the cavity. Ceiling linings as in table. 100% loadbearing ratio.

Board type	Lining thickness mm	Joist centres mm	Joist size mm	Sound insulation Airborne R_w dB	L_{nw} dB	System reference
30 minutes fire resistance BS **476: Part 21: 1987**						
Gyproc FireLine	1 x 12.5	450	195 x 45	53	64	C154003
60 minutes fire resistance BS **476: Part 21: 1987**						
Gyproc FireLine	2 x 12.5	450	195 x 45	59	59	C154006

Existing lath and plaster ceiling (up to 20mm thick) should be supported by chicken wire securely fixed to the joists.

This system underneath the existing joists can be used alongside **GypFloor SILENT** to upgrade the construction to a level capable of achieving the standards laid out in Building Regulations Approved Document E (AD E) – Residential Buildings.

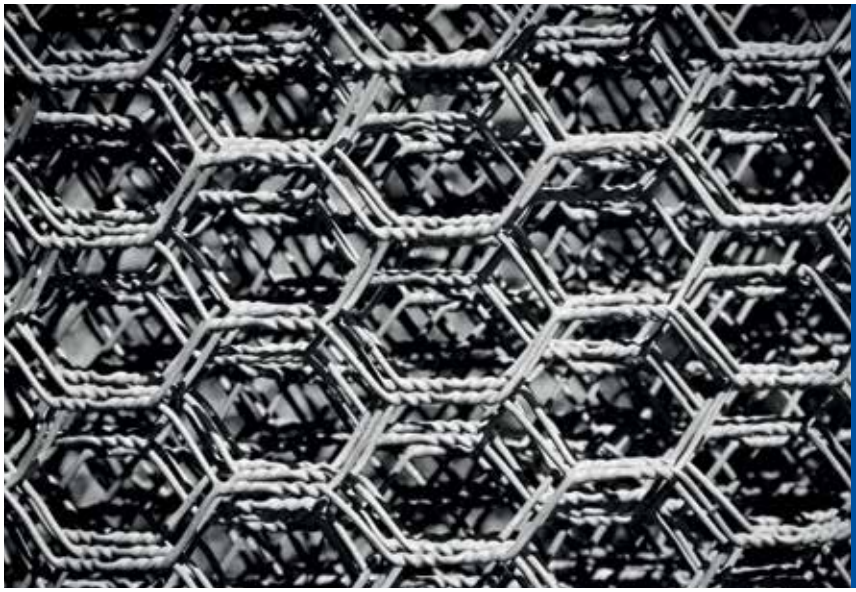


SILENT comprising of 21mm softwood floor boarding with Gyproc Plank on Gypframe SIF Floor Channels.

UNIVERSAL ceiling suspended with Gypframe GL1 Lining Channels at 450mm maximum centres. 100mm Isover Spacesaver Ready-Cut in the cavity. Ceiling linings as in table. 100% loadbearing ratio.

Board type	Lining thickness mm	Joist centres mm	Joist size mm	Sound insulation Airborne R_w (R_w +Ctr) dB	Impact L_{nw} dB	System reference
60 minutes fire resistance BS **476: Part 21: 1987**						
Gyproc Plank + Gyproc SoundBloc	19 x 12.5	450	200 x 50	63 (50)	55	C154008

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



Did you know?

When upgrading existing lath and plaster ceilings, the existing ceiling must be underdrawn with chicken wire. This is to keep the lath and plaster ceiling in place during construction and in the event of a fire.

Protecting buildings from hidden condensation.

Vapour control and moisture solutions

The focus on energy usage is becoming evermore important in our everyday lives. This has resulted in less air leakage and draughts and therefore more potential for water vapour to build up.

Vapour control

The rising cost of fuel bills and the desire to meet government emission reduction targets has resulted in building owners paying more attention to improvements. Thermal performance and air tightness are key factors in this consideration.

The focus on air tightness in particular has resulted in less air leakage and draughts, for example, ill-fitting windows, doors and at wall and roof junctions. As a consequence, there is greater potential for a build-up of water vapour in rooms such as bathrooms, en-suites or kitchens. This water vapour will try to travel to a cooler environment, passing through the building fabric into its structure.

Did you know?

Vapour and moisture are actually very different issues.

Vapour is the condensing of water on the internal fabric of a building. Here it can become trapped causing rot and corrosion of the structures around it. Moisture refers to water making contact with surfaces, such as splashbacks, shower units and wet rooms. In these places, water can pool or leak leading to a variety of rot and corrosion issues.

Surface condensation

Surface condensation occurs when air containing water vapour comes into contact with highly vapour resistant surfaces, which are at, or below, the dew point temperature. See Fig. 1 – Surface condensation (below). It usually shows itself as beads of water, damp patches, and, where the condition persists, mould growth.

Surface condensation can be in localised zones in a particular building element caused by the presence of 'cold bridges', such as mortar joints in walls, which can be colder than the rest of the wall structure.

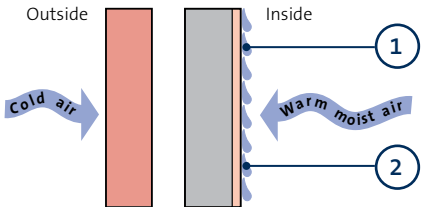
In addition, warm moist air will diffuse through a building into colder rooms, such as poorly heated bedrooms and stairwells. This is one reason why surface condensation does not always occur in the room where water vapour is produced.

Interstitial condensation

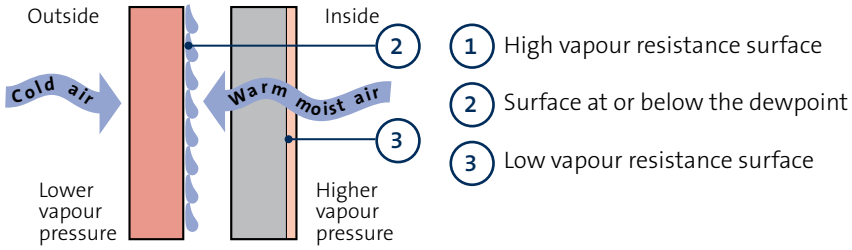
Warm moist air will also diffuse through building elements to reach colder, lower pressure conditions outside. If the building materials have low water vapour resistance it is possible for condensation to occur within the building element. This will occur on the first cold surface, at or below dew point temperature, which is encountered by the moisture vapour on its passage through the structure. As an example, for double skin masonry walls, the position for condensation to form is on the inner face of the outer leaf whether or not insulation is included in the cavity. See Fig. 2 – Interstitial condensation (below).

There is no evidence to suggest that interstitial condensation will occur within the core of building materials under general building and climatic conditions. For other types of building structure vapour control layers can help to eliminate the risk of interstitial condensation. It is recommended that the risk of harmful condensation be assessed using the calculation procedures given in *BS 5250*.

Surface condensation – Fig. 1



Interstitial condensation – Fig. 2



We provide a number of products that have the integral vapour control layer to restrict the progression of water vapour from a room into a structure.

Gyproc WallBoard **DUPLEX**, Gyproc FireLine **DUPLEX**, Gyproc ThermaLine **PLUS**, Gyproc ThermaLine **PIR**, all contain this layer. The water vapour trapped in the rooms can be ventilated to the outside world in a natural way, such as opening a window, or via Mechanical Ventilation and Heat Recovery (MVHR).

Moisture

If room surfaces are exposed to moisture this could result in damage and/or mould growth. Gyproc plasterboards should not be used in continuously damp conditions, nor in buildings that are not weathertight. However, Gyproc Moisture Resistant board, Gyproc SoundBloc **MR**, Gyproc DuraLine **MR**, Gyproc FireLine **MR** and Gyproc CoreBoard are all suitable for use in low moisture applications e.g. bathrooms, kitchens and sheltered external situations, where intermittent exposure is common.

Did you know?

All boards can be installed onto a wide range of framed lining or ceiling system solutions. The choice will depend upon the building and project scenario.
All board types can also be installed as an upgrade to existing metal or timber frame structures. An example of this would be a change of use of a room from a bedroom to a bathroom. The most common solutions are highlighted over the following pages.

GypLyner UNIVERSAL

GypLyner UNIVERSAL wall lining system is a cost effective and virtually independent metal frame drylining system. It's a general purpose system that is suitable for all internal non-loadbearing applications where it is important to maximise floor space.

This system is suitable for use in conjunction with the relevant board product, whether it be for vapour control purposes e.g. Gyproc **DUPLEX** range, Gyproc ThermaLine laminates, or in areas intermittently exposed to moisture e.g. Gyproc Moisture Resistant grade board.

GypLyner IWL

GypLyner IWL is an independent wall lining system. This is built independently of the external wall construction, and is suitable for areas where it is not desirable to fix directly to the existing wall.

This system is suitable for use in conjunction with the relevant board product, whether it be for vapour control purposes e.g. Gyproc **DUPLEX** range, Gyproc ThermaLine laminates, or in areas intermittently exposed to moisture e.g. Gyproc Moisture Resistant grade board.

NB Gyproc FireLine **DUPLEX** can be utilised for areas where enhanced fire protection to the structure is required.

Where continuing contact with water is expected a moisture resistant equivalent should be used.

Did you know?

Our range of Gyproc moisture resistant boards can be used in lieu of their standard equivalents where additional moisture resistance is required, maintaining all other performances.

For high moisture conditions e.g. a shower, Glasroc **H TILEBACKER** can be used as a tiling substrate.

CasoLine MF

CasoLine MF is a suspended ceiling system suitable for most internal drylining applications.

This system is suitable for use in conjunction with the relevant board product, whether it be for vapour control purposes e.g. Gyproc **DUPLEX** range, Gyproc ThermaLine laminates, or in areas intermittently exposed to moisture e.g. Gyproc **MR** range.

Did you know?

If you are upgrading thermal insulation, you need to be mindful of the need for vapour control.

Timber frame, joist and rafter ceilings

When an existing timber frame wall or timber joist/rafter ceiling needs to be lined as part of an upgrade or conversion project, it is necessary to consider vapour control and moisture management. This is especially important if the room is to be used for water vapour generating activities, exposed to wetting or if the structure is being thermally insulated. Examples of this could be a bathroom, a kitchen or thermally insulated external walls.

With timber in particular, it is important to negate the risk of moisture build-up within the structure. Any of the Gyproc **DUPLEX** or Gyproc ThermaLine laminate boards can be fixed direct to the existing timber frame.

Protecting people and property.

Fire performance

There is never a good outcome from a building fire. The potential for loss of life, damage to property and disruption to business can be colossal.

This being the case, it is vital that the fire performance of a building is maintained at all times and may need to be upgraded if the building's use changes.

The fire performance of a building must have two main functions:

Controlling fire growth:

Stopping fire spreading from the source.

Fire compartmentation:

Keeping the fire in one area, i.e. stopping it from travelling from one room to another.

Both of these factors need to be maintained over a building's lifetime. We offer products and systems that can help you make your building safe.

Did you know?

By using gypsum plaster on internal walls and ceilings, you are actually building additional fire performance into the fabric of the building.

Controlling fire growth

It is very important to use materials that will prevent the spread of fire, particularly in main thoroughfares or high traffic areas where the walls, ceilings and floors are likely to be the main way for fire to spread and grow.

Our wall and ceiling lining materials are either totally non-combustible or classified as a material of limited combustibility.

Regulatory Requirement	Euroclass	Board Solutions	Plaster Solutions
Non combustible	A1	Glasroc F **FIRECASE** Glasroc F **MULTIBOARD**	Thistle Multi-Finish, Thistle Board Finish, Thistle Universal One Coat, Thistle Hardwall, Thistle Bonding Coat, Thistle Browning, Thistle Tough Coat
Material of limited combustibility	A2	Gyproc WallBoard, Gyproc FireLine, Gyproc DuraLine and Gyproc SoundBloc	Thistle Durafinish

Fire compartmentation

When a fire starts within a building the walls and floors play a vital role in protecting the lives of people, stopping the fire from travelling and giving people time to escape.

The fire performance of a wall or floor may need to be upgraded if a new use for a space in the building means that a higher performance is needed.

Did you know?

It is a requirement to apply a Thistle finish plaster to the plasterboard surface to ensure the fire resistance performance is achieved. Alternatively, Gyproc jointing materials could be applied to the plasterboard joints.

Upgrading for a change of use (non-load bearing partitions)

The easiest way to upgrade suitable metal or timber framed partitions to a higher level of performance, is to simply add an extra layer of board to the existing partitions. The table below shows the most common solutions for this situation.

Note: If you don't know the performance level of the existing wall, you should assume it has no performance at all.

Existing wall performance	Upgrade to achieve 30mins	Upgrade to achieve 60 mins	Upgrade to achieve 120mins
No performance	Over board each side with 12.5mm Gyproc WallBoard	Over board each side with 15mm Gyproc FireLine or 15mm Gyproc DuraLine	Over board each side with two layers of 12.5mm Gyproc FireLine
30 mins		Over board each side with single layer of 12.5mm Gyproc WallBoard	Over board each side with two layers of 12.5mm Gyproc FireLine
60 mins			Over board each side with a single layer of 12.5mm Gyproc FireLine

Did you know?

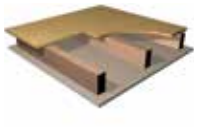
The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, or skimmed according to British Gypsum's recommendations. The quoted performances are achieved only if British Gypsum components are used throughout,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

Floor / ceiling types

Timber joist floors

If the existing ceiling boards are in good condition then the floor (when discussing fire performance a 'floor' is a combination of a ceiling below, the timber joists in the middle and the walking surface above) can be upgraded by adding an extra layer of plasterboard to the existing ceiling. Our solutions can obtain a fire performance up to 60 mins.

This is a simple solution with no need to remove the existing ceiling.



22mm t&g (softwood or chipboard) floor boarding over minimum 195mm x 38mm timber joists at 600mm centres. Noggings and linings as in table.

Board type	Nominal floor depth	Ceiling lining thickness mm	Noggings required to perimeter	Maximum loadbearing ratio	Sound insulation		System reference
					R_w Airborne dB	L_{nw} Impact dB	
30 minutes fire resistance BS **476: Part 21: 1987**							
Gyproc WallBoard	232	1 x 15	Yes	100%	40	–	C106029

GypLyner UNIVERSAL ceiling

This is a solution that provides a way to upgrade both the fire and sound performance of a floor / ceiling. This system will get the fire resistance performance up to 60mins.

18mm flooring grade chipboard and ceiling of Gyproc Plank and 12.5mm Gyproc WallBoard to simulate a wood lath and plaster ceiling. **GypLyner UNIVERSAL** ceiling suspended with Gypframe GL1 Lining Channels at 450mm maximum centres, to give a minimum cavity of 50mm to a maximum of 145mm. 50mm Isover APR 1200 in the cavity. Ceiling linings as in table. 100% loadbearing ratio.

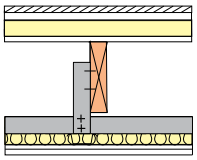
Board type	Lining thickness mm	Joist centres mm	Joist size mm	Sound insulation		System reference
				R_w Airborne dB	L_{nw} Impact dB	
30 minutes fire resistance BS **476: Part 21: 1987**						
Gyproc FireLine	1 x 12.5	450	195 x 45	53	64	C154003
60 minutes fire resistance BS **476: Part 21: 1987**						
Gyproc FireLine	2 x 12.5	450	195x45	59	59	C154006

Existing lath and plaster ceiling (up to 20mm thick) should be supported by chicken wire, securely fixed to the joists.

CasoLine MF

This is a solution that provides a way to upgrade the fire performance of a floor/ceiling and the sound performance at the same time. Typically 60 min fire resistance is required from this system, although it can provide solutions up to 120 minutes.

This system also provides lots of space for ventilation ducts and other services by creating a new ceiling void.



New floating floor laid over joists. **CasoLine MF** ceiling suspended beneath 195mm x 45mm timber joists at 600mm centres to give 277mm cavity. 100mm Isover Spacesaver Ready-Cut laid on ceiling boards.

Board type	Ceiling lining thickness mm	Approx. weight kg/m²	Floor depth mm	Sound insulation		System reference
				Airborne R_w (R_w + Ctr) dB	Impact L_{nw} dB	
60 minutes fire resistance BS **476: Part 21: 1987**						
Gyproc SoundBloc	2 x 15	27	381	66 (54)	50	C106025

Re-building / adding walls and liners

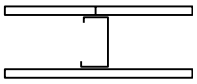
When the easiest solution to maintaining or upgrading fire performance of walls is to re-build them.

GypWall CLASSIC

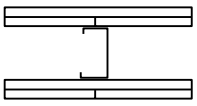
We offer a range of lightweight, easy to install wall systems that can achieve a range of fire performances from 30-120mins.

This simple system can achieve these fire performances at a variety of partition heights and acoustic performances.

Stud sizes available from 48mm to 146mm. Selection of stud section driven by performance in terms of partition height.

1 

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

2 

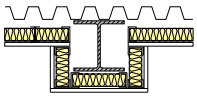
Two layers of board each side of 70mm Gypframe 'C' Studs at 600mm centres.

Detail	Partition thickness mm	Board type	Lining thickness mm	Max. partition height mm	Sound insulation R_w dB	Duty rating	Approx. weight kg/m²	System reference
60 minutes fire resistance BS **476: Part 22: 1987**								
1	102	Gyproc FireLine	1 x 15	3800	37	Heavy	24	A206078
120 minutes fire resistance BS **476: Part 22: 1987**								
2	122	Gyproc FireLine	2 x 12.5	4200	46	Severe	40	A206079

GypLyner IWL

GypLyner IWL is a lightweight, non-load bearing lining system standing free of the wall. This can be used in all types of building.

Stud sizes available from 48mm to 146mm. Selection of stud section driven by performance in terms of lining height.



Board linings to one side of Gypframe 'I' Stud framework and 50mm Isover Steel Frame Infill Batts, forming an independent lining to structural steel columns, in association with external steel cladding. Linings as in table.

Board type[1]	Lining thickness mm	Duty rating	System reference
Fire resistance[2] – 30 minutes integrity: 30 minutes insulation		**BS 476: Part 22: 1987**	
Gyproc WallBoard	2 x 12.5	Severe	B216003
Gyproc SoundBloc	2 x 12.5	Severe	B216003
Gyproc WallBoard	2 x 15	Severe	B216004
Gyproc SoundBloc	2 x 15	Severe	B216004
Fire resistance[2] – 60 minutes integrity: 30 minutes insulation		**BS 476: Part 22: 1987**	
Gyproc FireLine	1 x 12.5	Medium	B216025
Gyproc FireLine	1 x 15	Heavy	B216026
Fire resistance[2] – 90 minutes integrity: 30 minutes insulation		**BS 476: Part 22: 1987**	
Gyproc FireLine	2 x 12.5	Severe	B216027
Gyproc FireLine	2 x 15	Severe	B216028

[1] For improved durability and impact resistance, the outer layer of board can be replaced with a layer of Gyproc DuraLine.

[2] 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.

Where the external wall is more than 1m from the boundary, Building Regulations allow relaxation of the provision for insulation to 15 minutes in certain circumstances. The lining also offers fire protection to steel columns from the lining side, subject to A/V (Hp/A) factor.

Repairing walls and ceilings to a pristine finish, effortlessly.

Repair: Board fixed to board

British Gypsum offers a fire protection system for steel beams and columns called **FireCase**.

This system uses Glasroc F **FIRECASE**; a board that can be fixed to other boards using staples or Glasroc F **FIRECASE** Screws without an additional frame. To repair damage to this system:

Assess the degree of damage

- Identifying the extent of the damage allows the full repair to be planned out before commencing the job. This helps prevent unplanned delays.
- If the damage only affects the finish, please see 'Surface damage' on page 78.

Identify board layers

- Most constructions are one or two layers and damaged board in either layer will need replacing.

Cut away defective boarding

- Remove boarding back to a fix point.
- To ensure performances are maintained, board joints should be staggered by a minimum of 600mm.

Correct framework

- Check the existing framework angles for damage and replace or reinforce damaged components.
- Insert Gypframe GFS1 nogging supports to the perimeter of the replaced areas.
- Support board ends with Glasroc F FIRECASE.

Reinstate boarding

- Re-board the area with a matching performance board and thickness, fixing with appropriate Glasroc F FIRECASE screws at centres to match the original installation.

Complete surface finish (if required)

- Reinforce the board joints using Gyproc Joint Tape.
- Complete applications with Thistle finish coat plasters or Gyproc jointing compounds.
- For more information see the 'Surface damage' section on page 78.

Did you know?

The Glasroc F **FIRECASE** lining provides a smooth, robust surface with no requirement to joint or apply a decorative treatment.

Keeping buildings resistant to fire.

Fire stopping

If you are making any change within your building you need to consider the impact the changes might have on the fire performance of your walls, ceilings and floors.

A good example of this is the need to install a new light switch into a partition; first you need to understand the fire rating of that partition, and then make sure that the installation of the light switch does not downgrade the fire performance of the partition.

Other examples include:

- The installation of sockets and switches or other electrical equipment within walls or ceilings.
- The installation of downlighters into a ceiling.
- The installation of pipes or other services through walls or floors.
- The installation, removal or moving of access panels.

Did you know?

Any penetration of a wall, ceiling or floor can negatively affect the acoustic performance of a building as well as the fire protection performance.

Fire compartmentation

This means keeping the fire in one area, i.e. stopping it from travelling from one room to another.

When a fire starts in a building, walls, ceilings and floors play a vital role in protecting the lives of people. They contain the fire and allow the building occupants to escape.

The fire performance of a wall or floor can be compromised if, for any reason, the wall, floor or ceiling are penetrated or damaged.

Some common scenarios you might encounter

Installing an electrical socket or switch

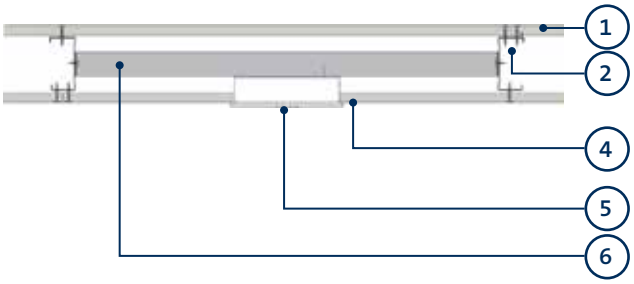
Fitting new electrical socket boxes or switches into a partition can damage fire and acoustic performance. However, with some attention this can be minimised.

Some of our typical details are shown below for 60 minutes and 120 minutes fire resistance. There are also a number of putty pad fire-stopping products available on the market from a range of manufacturers.

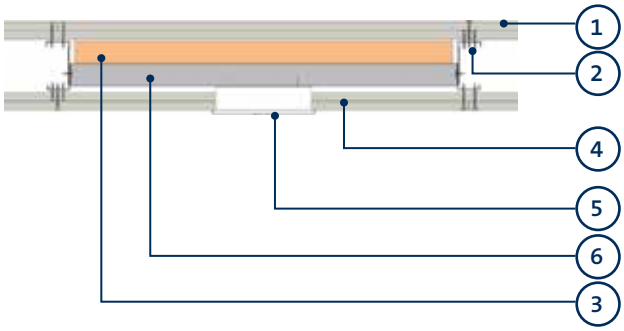
We are happy with the use of putty pads (and other such products) with our systems, but all performance substantiation has to be provided by the fire-stopping manufacturer as is the case for any fire-stopping material.

NB When fitting any electrical equipment the plasterboard should always be neatly cut and Gyproc Sealant should be applied where optimum acoustic performance is required.

Up to 60 mins



Up to 120 mins



1. Gyproc plasterboard or British Gypsum specialist board
2. Gypframe 'C' Stud
3. Stone mineral wool (minimum 80kg/m²) backing to socket box
4. Gyproc Sealant at switch box perimeter for improved acoustics
5. Electrical socket with metal back box fitted tight into plasterboard
6. Gypframe Standard Floor & Ceiling Channel receiving fixing of socket box – channel legs tabbed, bent and fixed to metal studs with British Gypsum Wafer Head Drywall screws

Installing a downlighter

Before you start fitting a downlighter into a ceiling, you should find out if the ceiling is contributing to the fire resistance performance of the building. Fire rated solutions for downlighters are available by other manufacturers and must be installed in line with the manufacturer's instructions.

Installing steel pipes through walls and floors – steel pipes

For a pipe with a diameter up to 100mm, a hole is cut 5mm greater than the diameter of the pipe. The gap is then sealed using a suitable fire rated sealant.

uPVC or combustible pipe penetrations

For uPVC or combustible pipes, a suitable fire rated collar must be installed in line with the manufacturer's instructions.

Installing an access panel

Our access panels are designed for use in partitions where there are services within the cavity that need to be accessed for maintenance.

Our access panels are available with 60min or 120min fire performance.

Gyproc Profilex FR1 Wall Panel – Integrity only (both directions)

Characteristics

A one hour fire-rated panel, which has been designed to seamlessly fit in plasterboard or masonry constructions. It is covered by British Gypsum's **SpecSure®** lifetime system warranty, which ensures quality and technical support throughout the building lifespan.

Application

A one hour fire-rated, beaded frame access panel, for application in walls only. This panel is widely specified in Gypframe metal systems where fire resistance is required.

Gyproc Profilex FR2 Wall Panel – Integrity only (one direction)

Characteristics

A two hour fire-rated beaded frame access panel, this panel is widely specified in British Gypsum ShaftWall systems when two hour fire resistance is required. It is covered by British Gypsum's **SpecSure®** lifetime system warranty, which ensures quality and technical support throughout the building lifespan.

Application

For application in walls only – ideal for British Gypsum **ShaftWall** systems.

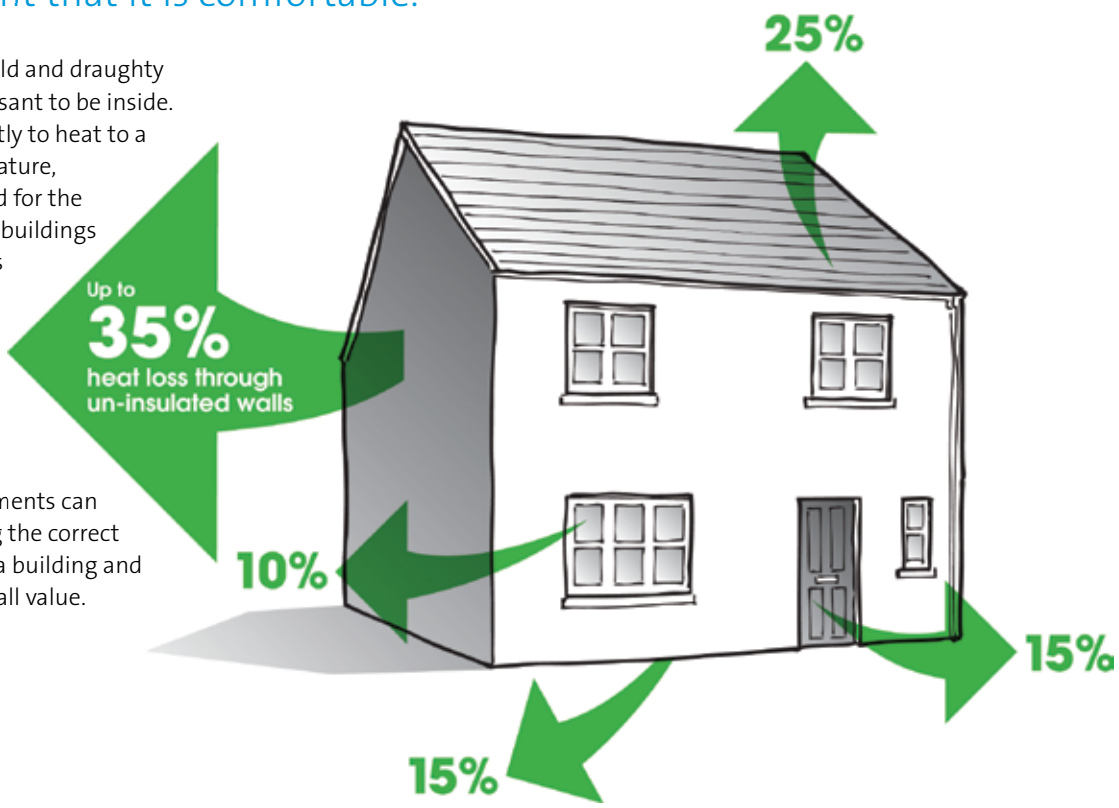
Creating energy efficient buildings.

Thermal solutions

Whether a building is used for living, working or recreation, it is important that it is comfortable.

Buildings that are cold and draughty are generally unpleasant to be inside. They can also be costly to heat to a comfortable temperature, whilst also being bad for the environment. Today, buildings emit 44% of the UK's entire greenhouse gases, with 27% coming from houses and 17% from other types of buildings.

Significant improvements can be made by applying the correct thermal solution to a building and can increase its overall value.



Did you know?

35% of heat loss from a building is through its walls. We offer internal wall insulation systems to make solid wall buildings more energy efficient. We also offer a range of training courses and assessments to enable installers to meet the requirements of Green Deal, ECO, PAS 2030 and associated standards. Please visit our website for more details.

Plaster within thermal performance

With ever-rising energy costs and more stringent building regulations, quality thermal performance is an essential aspect that needs to be considered in your building project. There are three elements to consider for an effective thermal design: thermal insulation, air tightness and thermal mass.

Thermal insulation

– The amount of heat loss through the external fabric of the building is critical to the thermal performance. This is directly related to the thermal insulation properties of the materials utilised within the walls and roofs. We have a range of insulation systems to enhance your building's thermal performance.

Airtightness

– Air leakage through joints and gaps in the building fabric can be a significant source of heat loss, particularly in a well insulated building where the impact will be proportionately higher. Thistle plasters are the most effective method for sealing blockwork to provide an effective, durable air barrier.

Thermal mass

– The ability of a masonry construction to store and release heat. This effect can be exploited by the building designer to help keep the building warm in the winter and cool in summer thereby reducing energy bills. Thistle plasters are compatible with masonry elements when designing to exploit thermal mass performance. Drylining techniques should not be used when designing to exploit thermal mass.

Thermal insulation is usually described as a U-value. This is a measure of how effective an element is at preventing heat loss. The lower the U-value, the better the performance. U-values are calculated using information about the full construction.

As it is not possible to capture all possible combinations in one document, examples are offered and product performances shown.

An R-value is a measure of thermal resistance in a product. The higher the R-value, the greater the performance.

The British Standard BS EN 13914-2:2005 states:

"Direct plastering is the most effective way of providing air tightness for masonry walls."

Performance → increasing

Gyproc ThermaLine **BASIC**		Gyproc ThermaLine **PLUS**		Gyproc ThermaLine **PIR**	
Thickness	R-value	Thickness	R-value	Thickness	R-value
22mm	0.35	27mm	0.54	38mm	1.15
30mm	0.55	35mm	0.79	53mm	1.85
40mm	0.80	40mm	0.94	63mm	2.30
		48mm	1.10	78mm	3.00
				93mm	3.65

British Gypsum has a comprehensive range of boards designed specifically to enhance thermal insulation. Improved performance is linked with material thickness. To ensure that room space can be maintained, differing thicknesses and carrier methods can be used.

Examples

GypLyner UNIVERSAL

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.

It provides a void of 25mm-125mm for service management and to allow for uneven backgrounds.

U-value
0.29 W/m²k

- 300mm solid stone
- **GypLyner UNIVERSAL** 25mm fixing cavity with 25mm Isover APR 1200
- 78mm Gyproc ThermaLine **PIR**

Dot and Dab is the common name for bonding boards to solid backgrounds. Different boards and backgrounds require different approaches, and these are covered under the **DriLyner** range of systems.

DriLyner TL

This is the most common way to bond a Gyproc ThermaLine laminate to a background.

It creates a circa 10mm cavity allowing for background tolerances.

It uses Gyproc Dri-Wall Adhesive and is compatible with most backgrounds, such as block and concrete, though preparation may be required.

U-value
0.27 W/m²k

- 103mm brick
- 50mm clear cavity
- 103mm brick inner leaf
- 10mm **DriLyner TL**
- 78mm Gyproc ThermaLine **PIR**

DriLyner RF

To save floor space, this is the thinnest way to bond a Gyproc ThermaLine laminate to a background.

It creates a circa 2mm cavity requiring an accurate background to follow.

It uses Gyproc Sealant and requires a smooth and firm background, such as existing plaster, to ensure a good bond.

U-value
0.28 W/m²k

- 16mm render
- 190mm block medium density (λ=0.61)
- 13mm plaster
- 10mm **DriLyner RF**
- 78mm Gyproc ThermaLine **PIR**

GypWall CLASSIC

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

The system is commonly used to achieve performances such as duty ratings and acoustic and fire compartmentation. It can also be used as an aesthetic division and thermal barrier by boarding with Gyproc ThermaLine range.

For a U-value using **GypWall CLASSIC** or further information, please contact the British Gypsum Technical Advice Centre.

GypLyner IWL

GypLyner IWL independent wall lining is a lightweight, non-loadbearing system, which is built independently of the external wall construction.

The lining can be used in association with new or existing masonry walls to increase sound insulation and meet thermal performance requirements.

Gypframe stud type	Gyproc ThermaLine laminates single mm
48I50	2400
60I50	2400
60I70	3000
70I70	3600
92I90	5100
146I80	6900

GypLyner IWL U-values for external claddings with lining / insulation combinations – based on a well vented external cladding cavity

External cladding	Board type	Lining thickness mm	Isover Steel Frame Infill Batts	U-value W/m²k (minimum)
Curtain walling / concrete cladding / panels / brickwork / blockwork, etc	Gyproc ThermaLine PIR	53	50mm (with Gypframe 48 I 50 'I' Studs)	0.34
	Gyproc ThermaLine PIR	63	50mm (with Gypframe 48 I 50 'I' Studs)	0.30
	Gyproc ThermaLine PIR	78	50mm (with Gypframe 48 I 50 'I' Studs)	0.26
	Gyproc ThermaLine PIR	78	75mm (with Gypframe 70 I 70 'I' Studs)	0.24
	Gyproc ThermaLine PIR	78	100mm (with Gypframe 92 I 90 'I' Studs)	0.22
	Gyproc ThermaLine PIR	78	2 x 75mm (with Gypframe 146 I 80 'I' Studs)	0.18

Did you know?

We have a range of internal wall insulation Green Deal solutions.
For more information, refer to www.british-gypsum.com

CasoLine MF

CasoLine 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 and Rigitone acoustic ceiling boards to create a seamless, monolithic appearance.

Equally, it can be lined with Gyproc ThermaLine boards to create a cost effective solution with adequate plenum to include additional insulation.

For a U-value using **CasoLine MF** or for further information please contact the British Gypsum Technical Advice Centre.

Appearances matter.

Aesthetics

The way we feel about a building we're visiting, living or working in is heavily influenced by the condition of its finish.

Be it patchy paintwork, wallpaper peeling, a dented skirting board, cracked plaster or messily installed cabling, these all contribute to a room which feels unloved. It's human nature to be less careful about a space which is in a poor state of repair. This can create a vicious cycle and a space that people neglect.

We have a variety of durable and aesthetic solutions to enhance the appearance of a room. These help to ensure a space looks fresh and remains appealing for many years to come.

To enhance the surface finish, we have systems that allow services to be discreetly enclosed, walls to be straightened and uneven surfaces to be smoothed over.

Whatever the scenario, when it comes to improving the look of a building interior, we have the answer.

Did you know?

If a space has walls that are cracked, crumbly or unsmooth, they can be totally transformed by reskimming. Our range of Thistle finish plasters offer the possibility of stunning smooth walls and ceilings, ready for a fresh lick of paint.

Thistle plasters

An expanse of smooth wall reflects the light, enhances the interior space and emphasises curves, alcoves and architectural features. Plaster can be the answer to a range of repair and maintenance issues. Whether you are repairing a small patch, or looking to totally re-skim a wall or ceiling, for the perfect finish, the Thistle plaster range provides the solution. It has a high quality result that suits many different background types.

Our range of Thistle plasters offer a variety of options for all types of projects, whilst providing consistent and reliable results.

For high traffic areas, Thistle Durafinish plaster will not only give you a high quality smooth finish, but also help to keep it that way. It is up to 60% tougher against abrasions than standard gypsum plaster.

GypLyner IWL

GypLyner IWL is an independent wall lining system which is built independently of the external wall construction. This is suitable for areas where it is not desirable to fix directly to the existing wall.

Due to the fact that **GypLyner IWL** is fixed top and bottom, it is possible to conceal sizeable services. Drainage, gas or water pipes are all typical examples of what could be hidden by this system without the need for unsightly boxing spoiling the lines of a room.

Stud type plasterboard 12.5mm	Gyproc ThermaLine laminates single (mm)
48 I 50	2400
60 I 50	2400
60 I 70	3000
70 I 70	3600
92 I 90	5100
146 I 80	6900

In addition, it is possible to use **GypLyner IWL** to hide very poor condition structures, or to straighten rooms that are considerably out-of-true, as can be the case in older buildings.

As this system requires the stud to be suitably rigid, the table above shows maximum heights based on the standard 600mm stud centres.

GypLyner UNIVERSAL

GypLyner UNIVERSAL wall lining system is a cost effective, virtually independent metal frame drylining system. It is a general purpose system that is suitable for all internal non-loadbearing applications where it is important to minimise the intrusion into the room space.

This system is ideally suited to the discreet concealment of a variety of cabling, as it allows a useable service void to be incorporated behind the board. This void can be varied from 25mm to 125mm, meaning that you can select the optimum balance between maximising floor space and fitting cabling and other services within the void.

The fact that the system depth is so adjustable allows existing surface irregularities to be accommodated as well. This can mean an entire wall surface can be easily straightened.

CasoLine MF

CasoLine 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, Gyptone and Rigitone acoustic ceiling boards to create a seamless, monolithic look.

The depth to which **CasoLine MF** is hung from the supporting structure can be varied considerably in order to accommodate large services such as Heating Ventilation and Air Conditioning (HVAC) ducting and electrical trays.

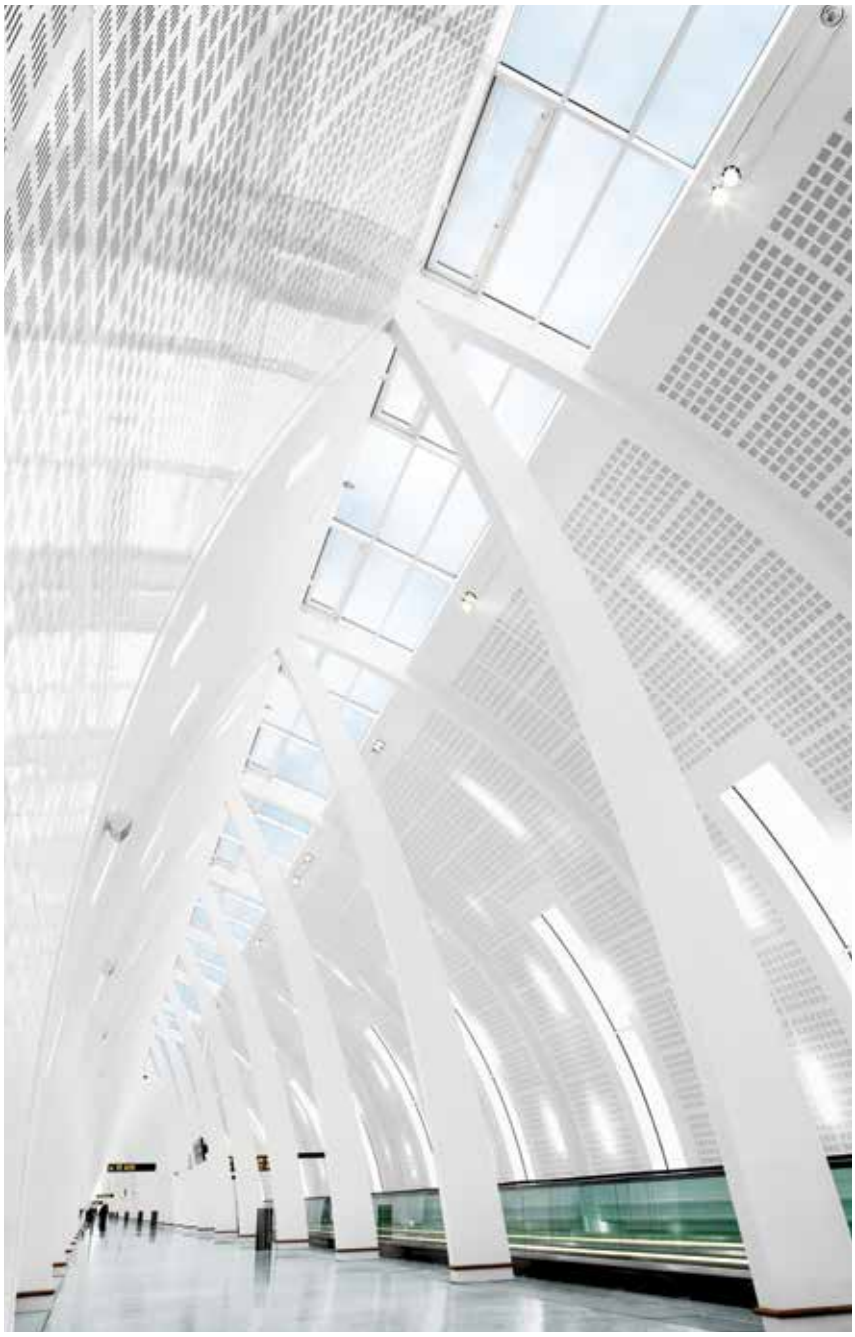
Hiding large amounts of unsightly industrial duct and pipework can transform the appearance of a room, making it much more appealing to the occupants. For a range of aesthetic, perforated ceiling boards and tiles go to the 'Ceiling solutions' section on page 142.

From atria to corridors, tuition rooms to offices, sports halls to drama theatres, British Gypsum ceilings will provide just the level of acoustic control you need, with a choice of exciting modern designs that will create exactly the right visual and acoustic ambience for every area.

For designers of buildings small or big, showpiece or functional, British Gypsum acoustic ceilings have provided the inspiration to combine functionality and performance with exciting and eye-catching design that ensures long-lasting impact.

Our acoustic ceilings combine the environmental and performance benefits of gypsum with eye-catching design to provide solutions for many different areas and types of building – solutions that meet almost every performance criteria whilst helping to create a uniquely safe and sustainable internal environment for building users.

Whether you combine Gyptone's attractive modern geometric perforation patterns with plain board to create stunning acoustic ceilings that steal the eye, choose the dramatic seamless appearance of Rigitone, or take the hygienic route with vinyl-faced Gyprex, you can guarantee performance and appearance for years to come.



Creating stunning rooms in the roof.

Loft Conversions

Between a quarter and a third of the volume in the average home is tucked away under the roof. Some of this space may be used for storage, but it could be turned into valuable extra living space.

Compared to building an extension, converting the roof space is usually straightforward and involves far less red tape. An added bonus with loft conversions is that none of the garden is sacrificed for the extra space.

To provide additional rooms, careful consideration must be given at the design stage.

Headroom

The aspects which determine the space you have in a loft are the span between the eaves and the pitch or slope of the roof (which in turn determines the height). Most detached and semi-detached homes have a wide enough span, and if the slope or pitch is more than 35°, then you should have enough volume to make a decent sized room.

Shape

More complex roof shapes need more careful examination. Hipped roofs are convertible, but not as easily. If the upper floor of a house is built partly into the roof (the one and a half-storey house or chalet /dormer bungalow) then a loft conversion is unlikely to be possible.

Did you know?

Generally, most loft conversions don't require planning permission. However, planning permission is required:

- If you wish to raise the ridge of the roof.
- If you change the shape of the roof at the front of the house or at the side.
- If you have a corner plot.
- If your house has already been extended, you may have used up your permitted development rights, in which case all changes to roof shape (whether to front, back or side) will need planning permission.
- If your house is listed or if it happens to be in a conservation area.

Fink roof truss

Perhaps the biggest single stumbling block people will come across is the fink roof truss, common on new-build homes since the 1960s. The roof truss consists of a number of independent, triangular roof-shaped sections stacked together side by side.

Unlike traditional cut roofs where the individual timber rafters are loadbearing, the fink roof truss derives its strength from the combination of all the small pieces of timber working together as one. Consequently, you cannot readily alter a fink roof truss and conversion becomes a very difficult matter, though not impossible.

Please seek the advice of a timber engineer to see if your trussed roof could be adapted.

Stairs

Another major design issue is access. One of the largest areas of extra expense when considering loft living is the fitting of a staircase. In three-storey designs, because of fire regulations, you ideally want to position the top staircase close to the lower one and this can rather limit your room layouts.

Planning issues

Generally, most simple loft conversions do not require planning permission. The exception tends to concern lofts where you change the roof shape or where your house is listed or in a conservation area where the planning rules are much stricter.

For planning permission requirements see the 'Did you know?' box on page 133.

Building regulations

If you intend to use the new rooms as habitable space you should ensure that the work is carried out in accordance with the regulations.

There are several areas to consider. If you are altering the timbers in a roof space, you need to be satisfied that the new design will be strong enough to bear the new loads. Usually your existing ceiling joists will not be strong enough to act as floor joists for the loft conversion, however there are various ways of strengthening them.

The roof carpentry will also have to be carefully designed to ensure that it stays in place whilst the structural alterations are undertaken, and is then adequate for the open roof space you need. This may require the insertion of steel beams to support the new loadings, and also the reinforcement of existing rafters with additional timber, having the effect of increasing the available space for insulation.

Perhaps the biggest hurdle faced by loft converters is meeting the fire safety regulations. In addition to other requirements, you need to provide a fire-proofed route from the loft down to the front door.

30 minute fire-proofing is not particularly difficult to achieve, but it will require additional work to be carried out on the doorways (and possibly the walls) leading onto your escape route – typically the bedroom doors opening onto a landing. These doors will have to be treated (either with fire-resistant paint or fire-proof board).

You may face additional problems if your existing stairwell exits into a living room or kitchen, rather than an enclosed hallway. This type of arrangement is not acceptable and you might have to build an enclosure around the staircase or find another route down to the ground such as an external fire escape.

Building Regulations Approved Document L

Approved Document L1B (ADL1B) includes extensions, creating new dwellings through material change of use or material alterations to existing dwellings. Compliance with ADL1B is centred around CO_2 emissions of the whole building, provided it is technically, functionally and economically feasible.

Approved Document L states: "Where a person is to carry out work in an existing building which involves the renovation of a thermal element reasonable provision shall be made to improve the energy efficiency of the thermal element".

Retained thermal elements

Part L of the Building Regulations applies to retained thermal elements in the following circumstances:

a. where an existing thermal element is part of a building subject to a material change of use;
b. where an existing element is to become part of the thermal envelope where previously it was not, e.g. as part of a loft or garage conversion where the space is now to be heated.

Reasonable provision would be to upgrade those thermal elements whose U-value is worse than the threshold value in column (a) of Table 1, to achieve the U-values given in column (b) of Table 1 – provided this is technically, functionally and economically feasible.

A reasonable test of economic feasibility is to achieve a simple payback of 15 years or less. Where the standard given in column (b) is not technically, functionally or economically feasible, then the thermal element should be upgraded to the best standard that is technically and functionally feasible and delivers a simple payback period of 15 years or less. Generally, this lesser standard should not be worse than 0.7 W/m^{2}k.

For example, if the cost of implementing a measure was £430, and the value of the energy savings was £38 per year, the simple payback would be (430/38) = 11.3 years.

Examples of where lesser provision than column (b) might apply are where the thickness of the additional insulation might reduce usable floor area of any room by more than 5% or create difficulties with adjoining floor levels, or where the weight of the additional insulation might not be supported by the existing structural frame.

Table 1

Upgrading retained thermal elements

Element	(a) Threshold U-value W/m^{2}k[1]	(b) Improved U-value W/m^{2}k[1]
Wall – cavity insulation	0.70	0.55
Wall – external or internal insulation	0.70	0.30
Pitched roof – insulation at ceiling level	0.35	0.16
Pitched roof – insulation between rafters	0.35	0.18
Flat roof or roof with integral insulation	0.35	0.18

[1] Area-weighted average values

Technical Handbook Section 6 Scotland

Every building must be designed and constructed in such a way that an insulation envelope is provided which reduces heat loss.

Where conversion of an unheated building (e.g. a barn) or part of a dwelling (e.g. roof space) is to be carried out, the building should achieve the same standards as an extension to the insulation envelope.

In the case of a roof space, this will usually involve extending the insulation envelope to include the gables, the collars, a part of the rafters and the oxters, as well as any new or existing dormer construction.

The opportunity should be taken at this time to upgrade any remaining poorly performing parts of the roof which are immediately adjacent to the conversion, for example, insulation to parts of the ceiling ties at the eaves.

Where the insulation envelope of a dwelling is extended, the new building fabric should be designed in accordance with one of two levels of elemental U-values for walls, floors, roof, windows, doors and rooflights, as shown in the table below.

The applicability of particular maximum U-values for new works is determined by the energy performance of the existing building, assessing external wall and roof elements.

Where a building has external walls with a U-value poorer than 0.7 and a roof with a U-value poorer then 0.25, then the more demanding U-values in column (a) should be applied.

Where existing wall and roof elements already meet or, as part of the works, will be upgraded to meet U-values of 0.7 and 0.25 respectively, the U-values in column (b) can be applied.

Type of element	Area-weighted average U-value (W/m²k) for all elements of the same type		(c) Individual element U-value (W/m²k)
	(a) where U-values for wall and roof of the existing dwelling are poorer than 0.7[1] and 0.25 respectively	(b) where parameters for column (a) do not apply	
Wall[2]	0.19	0.22	0.70
Pitched roof (insulation between ceiling ties or collars)	0.13	0.15	0.35
Flat roof or pitched roof (insulation between rafters or roof with integral insulation)	0.15	0.18	0.35

NB

[1]The Building Standards (Scotland) Amendment Regulations 1982, which came into force on 28 March 1983, introduced thermal insulation for an exposed wall broadly equivalent to 0.7 W/m²k.

[2]Excluding separating walls and separating floors between heated areas where thermal transmittance need not be assessed, provided measures to limit heat loss arising from air movement within a cavity separating wall are made.

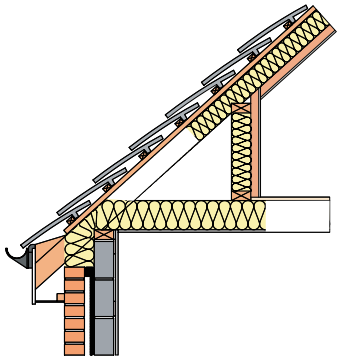
Wall linings

Wall linings in loft conversion projects must be designed to meet the requirements of Building Regulations Approved Document L (or Technical Handbook Section 6 in Scotland).

Typical examples are set out below.

Construction details

- Timber studs at 600mm centres.
- Insulation installed between the studs (see table).
- Timber fraction 15%.
- Gyproc ThermaLine laminate lining screw-fixed to the face of the studs (see table).



U-values (W/m²k)	Board lining	Insulation
0.31	35mm Gyproc ThermaLine **PLUS**	100mm Isover Frame Batt 35
0.30	40mm Gyproc ThermaLine **PLUS**	100mm Isover Frame Batt 35
0.28	38mm Gyproc ThermaLine **PIR**	100mm Isover Frame Batt 35
0.24	35mm Gyproc ThermaLine **PLUS**	150mm Isover Frame Batt 35
0.23	40mm Gyproc ThermaLine **PLUS**	150mm Isover Frame Batt 35
0.23	53mm Gyproc ThermaLine **PIR**	100mm Isover Frame Batt 35
0.23	38mm Gyproc ThermaLine **PIR**	150mm Isover Frame Batt 35
0.19	53mm Gyproc ThermaLine **PIR**	150mm Isover Frame Batt 35

Gable walls

Gable walls in semi or detached homes must be designed to meet the requirements of Building Regulations Approved Document L (or Technical Handbook Section 6 in Scotland) for external walls.

Separating walls

Where present, separating walls within a room-in-the-roof situation must be designed to meet the requirements of Building Regulations Approved Document E (or Technical Handbook Section 5 in Scotland).

Internal walls and stair enclosures

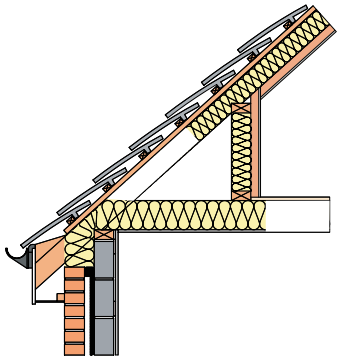
An internal wall positioned as below must meet Building Regulations Approved Document E sound regulation requirement of R_W 40dB (or Technical Handbook Section 5 requirement of R_W 43dB);

Internal walls which include a door are exempt from this requirement (England and Wales only).

Roof (incorporating breather membrane)

The ceiling within the roof construction in loft conversion projects must be designed to meet the requirements of Building Regulations Approved Document L (or Technical Handbook Section 6 in Scotland).

Typical examples are set out below.



Construction details

- Tiled or slated roof on tiling battens on breather membrane.
- Softwood rafters.
- Insulation installed between rafters.
- Timber fraction 7.3%.
- Gyproc ThermaLine laminate as a ceiling lining screw-fixed to the underside of rafters.

U-values (W/m²k)	Board lining	Insulation
0.20	38mm Gyproc ThermaLine **PIR**	150mm Isover Frame Batt 35
0.21	63mm Gyproc ThermaLine **PIR**	100mm Isover Frame Batt 35
0.19	78mm Gyproc ThermaLine **PIR**	100mm Isover Frame Batt 35
0.18	53mm Gyproc ThermaLine **PIR**	150mm Isover Frame Batt 35
0.17	63mm Gyproc ThermaLine **PIR**	150mm Isover Frame Batt 35
0.17	93mm Gyproc ThermaLine **PIR**	100mm Isover Frame Batt 35

Top floor

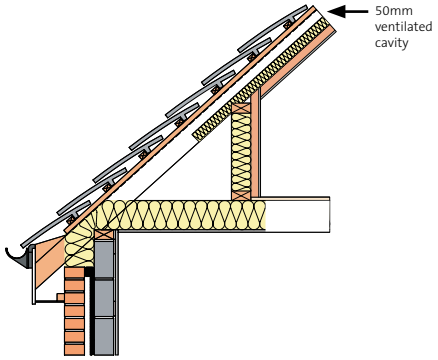
The top floor of a house must be designed to meet the requirements of Building Regulations Approved Document B (or Technical Handbook Section 2 in Scotland) and Building Regulations Approved Document E (or Technical Handbook Section 5 in Scotland).

The fire resistance requirement for the floor varies depending upon whether the room-in-the-roof is the third storey (30 minutes fire resistance required) or fourth storey (60 minutes fire resistance required) in a home.

Roof (incorporating sarking felt and ventilated cavity)

The ceiling within the roof construction in loft conversion projects must be designed to meet the requirements of Building Regulations Approved Document L (or Technical Handbook Section 6 in Scotland).

Typical examples are set out below.



Construction details

- Tiled or slated roof on sarking felt with 50mm ventilated cavity.
- Softwood rafters.
- Insulation installed between rafters.
- Timber fraction 7.3%.
- Gyproc ThermaLine laminate as a ceiling lining screw-fixed to the underside of rafters.

U-values (W/m²k)	Board lining	Insulation
0.20	38mm Gyproc ThermaLine **PIR**	150mm Isover Frame Batt 35
0.21	63mm Gyproc ThermaLine **PIR**	100mm Isover Frame Batt 35
0.19	78mm Gyproc ThermaLine **PIR**	100mm Isover Frame Batt 35
0.18	53mm Gyproc ThermaLine **PIR**	150mm Isover Frame Batt 35
0.17	63mm Gyproc ThermaLine **PIR**	150mm Isover Frame Batt 35
0.17	93mm Gyproc ThermaLine **PIR**	100mm Isover Frame Batt 35

Returning ceilings to perfection.

Repair: Tile and grid

An exposed grid ceiling system uses hangers at regular centres to support a lightweight framework, creating modular openings for tiles to be placed into.

Assess the degree of damage

- Identifying the materials, the accessibility of the replacement product and the extent of the damage, allows the full repair to be planned out before commencing the job.
- This helps prevent unplanned delays.
- It is important to make sure that the grid's support hangers are intact and that it is safe to work underneath the ceiling.
- Isolate and make safe any integrated services e.g. electrical fittings, detectors, sprinklers.

Strip back

- Remove any damaged existing ceiling tiles ensuring that ceiling mounted services are supported.
- Strip out all damaged or obsolete grid components back to undamaged area.
- Renew damaged hangers after ensuring fixing points are still secure.

Replace

- Replace grid components at correct level and secure to hangers.
- Install new tiles.

Edges

- Consider cutting perimeter tiles to sit on three edges for rebated edge tiles, ensuring they sit correctly in the grid.

Did you know?

CasoLine QUICK-LOCK GRID is a high-quality T15 grid system, designed to provide a highly stable grid suitable for both Gyprex and Gyptone tiles.

It can be used with square and rebated tiles and in conjunction with Gyprex **SATINSPAR**, giving 30 minutes fire resistance to BS 476 Part 23.

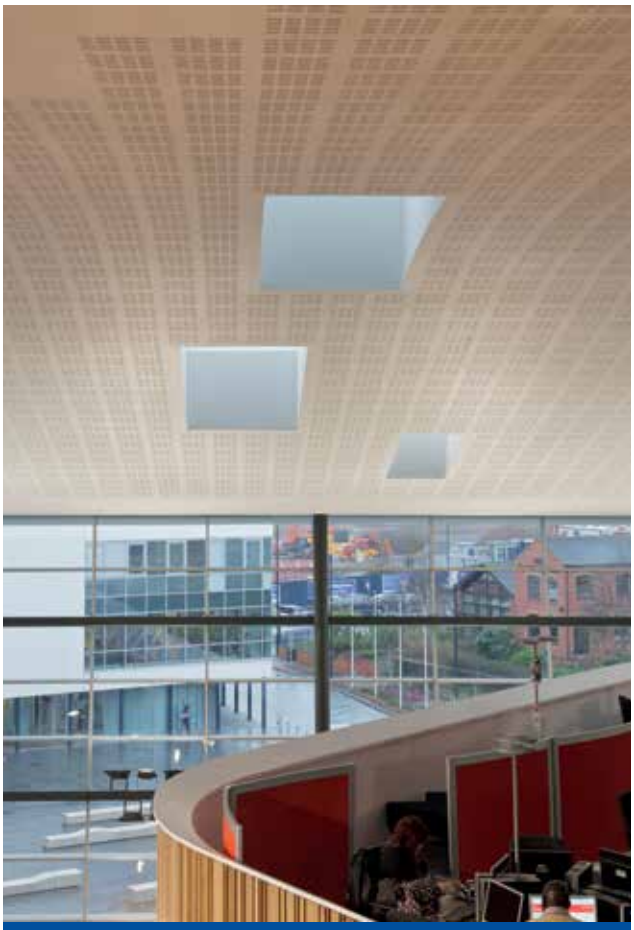
Beautiful acoustics delivered by beautiful ceiling solutions.

Ceiling solutions

Suspended ceilings can be found in a vast range of buildings: shops, offices, schools, hospitals, and larger residential developments.

Installing a new suspended ceiling or upgrading an existing one provides an opportunity to improve the building environment. Aesthetics, acoustic performance, thermal efficiency and even air quality can be significantly improved, creating a healthier, more comfortable and more productive environment for the building occupants.

The following section is designed to help explain the ways current constructions can be improved. Ceiling performance can be considered in four ways: aesthetics, acoustics, accessibility and air quality. Suitable systems to improve each of these are explained overleaf.



Did you know?

British Gypsum Gyptone and Rigitone ceiling products can be repainted to give them a new lease of life. Providing you apply the paint using a roller or paintbrush to the boards and tiles, they will retain all of their acoustic performance.

Three steps to the perfect ceiling solution

Choosing an appropriate ceiling solution can be done easily in three simple steps:

Step 1	Decide the performance characteristics that need to be included in the ceiling. Think about what you want it to do in terms of aesthetics, acoustics, accessibility and air quality. This can be done by answering the four questions below in Table 1.
Step 2	Find which ceiling system will meet the performance from Step 1, by referring to the product selector in Table 2.
Step 3	Once the ceiling system has been decided, confirm which supporting frame is required by using the information in Table 3.

By following these three simple steps, you will easily identify the most appropriate ceiling solution to meet your needs.

Step 1: Decide the performance characteristics

Table 1

Question	Description
Acoustics Is sound absorption required?	Some degree of sound absorption is usually required in 'noisy' rooms, particularly classrooms and office areas with large numbers of people, activity or machinery. Installing an acoustic ceiling with high sound absorption properties can significantly improve the levels of comfort and concentration of occupants in the room. → If sound absorption is required, refer to Rigitone board, Gyptone tile or Gyptone board in Table 2.
Aesthetics Is a decorative finish required?	If the installed ceiling needs to be decorated once installed, for example to meet a particular colour scheme or interior design, this will affect the choice of available systems. Gypsum boards are easy to paint using standard emulsion and a short-haired roller. NB Do not spray paint the ceiling, as this can significantly reduce the acoustic properties. → If the ceiling is to be painted, a board solution is required – refer to Rigitone or Gyptone board in Table 2.
Access Is regular access required?	Above every suspended ceiling, there will be some kind of services cabling, pipes, ductwork, mechanical equipment and so on. These services will require regular access for inspection, maintenance, or repair. It's important to consider where and how often access will be required, and choose a ceiling system that can meet this. → For frequent access, select either a tile system or Gyptone board with integrated access hatch / trap – refer to Table 2.
Air Quality Is improved air quality required?	VOCs are naturally occurring pollutants that are emitted into our homes, offices and schools by people, pets, furniture and carpets. Long term exposure to these pollutants can lead to a variety of health issues (see inset box on page 147). Modern ceiling materials, such as Gyptone ACTIV*air*, can improve air quality by absorbing formaldehyde from within the room, contributing to the comfort and general wellbeing of the occupants. → To benefit from the formaldehyde-absorbing performance of ACTIV*air*, choose a Gyptone board or tile solution – see Table 2.

Step 2: Select the right ceiling system

Use the following table to select an appropriate system, based on the specific performance requirements of your project. As you can see, if all four areas of performance are required, Gyptone boards represent the most complete solution.

To see our full range of ceiling tiles and boards, please go to www.british-gypsum.com

Table 2

	Gyptone board	Rigitone board	Gyptone tile	Gyprex tile
Sound absorption	x	x	x	
Decorative finish	x	x		
Regular access	x*		x	x
Improved air quality	x		x	

*Regular access can be achieved using the Gyptone Access Hatch or Access Trap

Gyptone boards

QUATTRO 46

12-20/66

Gyptone tiles

LINE tiles

Rigitone boards

Gyprex tiles

Step 3: Confirm which supporting frame is required

There are two basic supporting frames available. **CasoLine MF** is a concealed metal frame used to mount Gyptone and Rigitone boards systems, fixing them permanently in place. **CasoLine QUICK-LOCK GRID** is a lay-in system, used to provide a 'grid' into which Gyprex or Gyptone tiles can be placed.

Use the table below to confirm which supporting frame is required, based on the ceiling system selected in Step 2.

Table 3

	Gyptone board	Rigitone board	Gyptone tile	Gyprex tile
Frame required	**CasoLine MF**	**CasoLine MF**	**CasoLine QUICK-LOCK GRID**	**CasoLine QUICK-LOCK GRID**

CasoLine MF

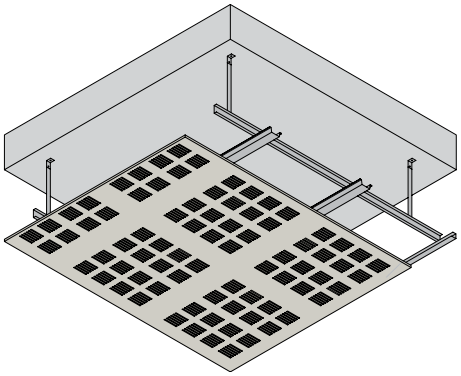
A robust suspended ceiling support system able to accept a degree of loading. It enables the plenum to be used to route ducting and other services and can be accessed via a matching access hatch (see page 121). Ventilation openings and other services can also be accommodated. The system comprises a concealed metal framework suspended from the structural soffit using strap hangers or angle sections. Gyptone or Rigitone boards are screw-fixed to the framework to form the ceiling lining. The lining is jointed to form a seamless surface suitable to receive most decorative finishes.

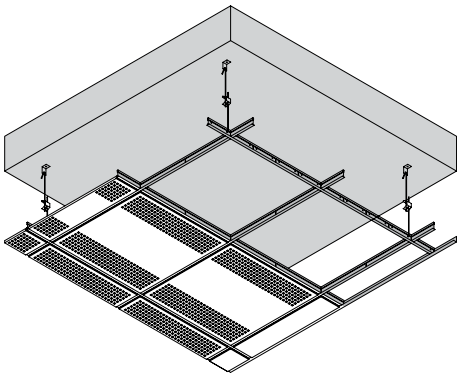
CasoLine QUICK-LOCK GRID

The **CasoLine QUICK-LOCK GRID** system is a hook-on, butt-cut grid system designed for use with Gyprex and Gyptone A, E15 and E24 tiles. This precision engineered product provides a highly stable rigid grid with excellent speed of installation.

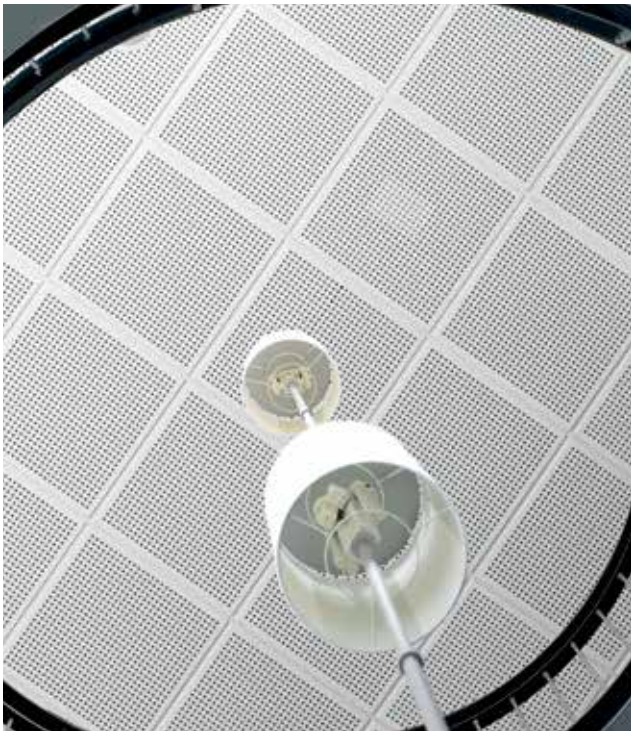
The galvanised steel sections are capped with white polyester finished aluminium.

CasoLine QUICK-LOCK GRID and Gyprex **SATINSPAR** will achieve a 30 minute fire rating to BS 476: Part 23 when used with the **CasoLine QUICK-LOCK** Quick Hanger.





Gyptone **QUATTRO 41** board on **CasoLine MF** frame



Gyptone **QUATTRO 20** tiles on **CasoLine QUICK-LOCK GRID**

Product selection and specification

In some forms of construction, full NBS specifications are used to articulate the product selection and these can be generated on a bespoke basis. However, to assist with communicating the chosen solution in brief, the following paragraphs are offered:

To specify Gyprex tiles

Suspended ceiling to be designed and installed in accordance with BS *EN 13964:2004*, utilising vinyl faced gypsum tiles manufactured to *EN 14190:2005*. Lay-in grid to be designed, manufactured and installed in accordance with BS *EN 13964:2004*.

To specify Rigitone boards

Suspended ceiling to be designed and installed in accordance with *EN 13964*, utilising gypsum tiles and boards manufactured in accordance with *EN 14190:2005*. **CasoLine MF** frame to be manufactured in accordance with *EN 14195:2005*.

To specify Gyptone tiles

Suspended ceiling to be designed and installed in accordance with BS *EN 13964:2004*, utilising gypsum tiles and boards manufactured to *EN 14190:2005* and up to 70% formaldehyde absorption. Lay-in grid to be designed, manufactured and installed in accordance with BS *EN 13964:2004*.

To specify Gyptone boards

Suspended ceiling to be designed and installed in accordance with BS *EN 13964:2004*, utilising gypsum tiles and boards manufactured to *EN 14190:2005* and up to 70% formaldehyde absorption. **CasoLine MF** grid to be manufactured in accordance with *EN 14195:2005*.

Rigitone 8-15-20 board on **CasoLine MF** frame

Gyptone **POINT** 11 on **CasoLine QUICK-LOCK GRID** system

ACTIV*air* – Creating the perfect atmosphere

While any suspended ceiling can improve the appearance or acoustics of the room below, a small number of them can actually make an even greater contribution to the comfort and wellbeing of building occupants. For example, our Gyptone range of ceiling tiles and boards can actually improve the air quality within a room, by removing naturally occurring formaldehyde, a common VOC, from the interior environment.

VOCs are naturally emitted into our homes, offices and schools by people, pets and cleaning products as well as furniture, carpets, paints and varnishes. They have been linked to a range of health problems and symptoms such as headaches, nausea, poor concentration, fatigue and breathing difficulties.

You can't see VOCs, or smell them. Therefore there is no way of knowing what concentrations you are being exposed to on a daily basis. ACTIV*air* is a new technology supplied as standard in Gyptone ceiling tiles and boards, which absorbs formaldehyde from the room and breaks it down into harmless inert compounds, thus eliminating the risk of re-emission.

Furthermore, ACTIV*air* contributes towards 2 BREEAM points under indoor air quality, as part of a management plan and handover test plan.


If it happens, we're here
to support you.

Water damage

The results of water damage are never good, but if it does happen, then we have in-house experts in our Technical Advice Centre, who can help you find the best solution to damaged walls and ceilings.

Where water damage has affected an area, we are able to offer the following guidance about what might be considered as defective and how you could proceed with repairs. It is worth keeping in mind that identification is not always easy. Contact details of our Technical Advice Centre can be found online at www.british-gypsum.com

For plasterboard

We recommend, when Gyproc plasterboard (other than moisture resistant grades) has been subjected to water, the board should be removed and replaced with an equivalent Gyproc product to maintain the original performance criteria.

Boards should also be replaced when they are 'bowed', suffering with mould growth or where paper delamination has occurred.

Other instances, such as surface wetting which may dry out relatively quickly, could still develop water stains or mould requiring remedial treatment / action at a later stage of the project.

When Gyproc plasterboard (including moisture resistant grades) may have been exposed to contaminants in the water, or where mould growth is present, professional advice should be obtained.

Did you know?

Areas that have suffered water damage take much longer to dry out than people think. Failure to let these areas totally dry out before repair can lead to damp, or worse, water being trapped in a cavity, causing rot and erosion to the structure behind.

For plaster

When Thistle plaster applications have been subjected to water, we recommend that the plaster is removed and replaced with an appropriate Thistle plaster product to maintain the original performance criteria.

Where mould growth is present, professional advice should be obtained before any remedial treatment is carried out. Additionally, any potential for salt migration from the background should be treated as necessary before re-plastering.

In other instances where only the finish coat plaster has been affected, it may be satisfactory to re-finish with the appropriate finish coat plaster. However, such areas could still develop stains, salts or mould growth at a later stage of the project, which may require further remedial treatment / action.

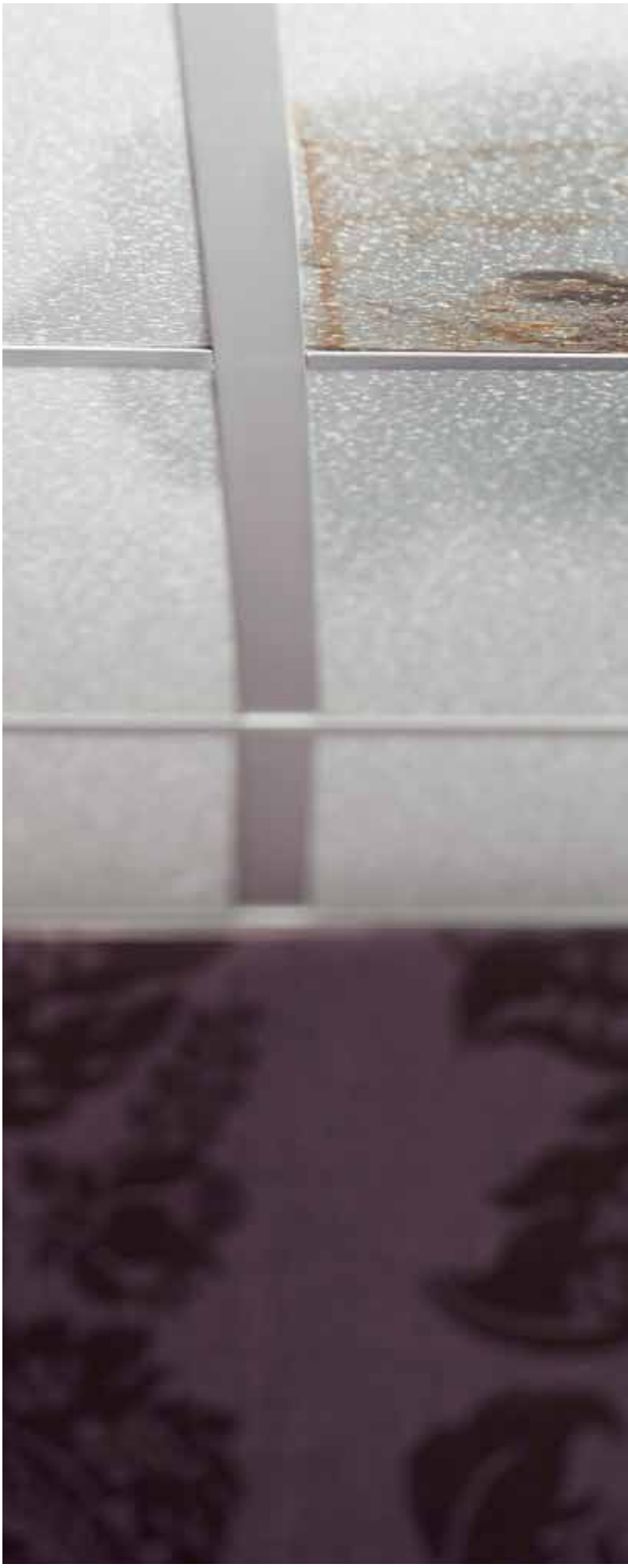
For cavities

If water damage is suspected in constructions forming a cavity, e.g. a stud wall or suspended ceiling, this should also be inspected. In these situations, if there is a likelihood of exposure to contaminants and the potential for mould growth problems, then these should be replaced.

Most metal components and accessories are galvanised to a recognised British Standard. However, consideration should be given to the possibility of rusting where items have been cut or penetrated. The latter is normally only relevant if a prolonged period of exposure has occurred.

Care should be taken to remove any remaining water from within the ceiling furrings or channels, etc. prior to re-boarding. Boards or decoration can also be affected, as above.

Isover insulation in cavities has water repellent qualities. If its form is unchanged, the performance should not be affected. We recommend that any cavity be allowed to dry out thoroughly and the insulation element and cavity is checked. Consideration should be given to the possibility of exposure to contaminants in the water or the potential for mould growth problems.



Making indoor spaces healthier.

Indoor air quality

We typically spend 80% of our time indoors, in schools, offices, hospitals and our homes. Clean air is something we assume we have in the buildings in which we live, work and learn, yet impurities found in the air can cause health problems and a reduction in our general wellbeing.

Clean air on the other hand can speed up patient recovery in hospitals, reduce absence at work and increase pupils' concentration at school.

Volatile Organic Compounds (VOCs)
Although we don't notice them, pollutants called volatile organic compounds (VOCs) are often present in the air we breathe - naturally emitted from furniture, carpets, paints, varnishes, cleaning products and building materials.

VOCs are organic compounds having an intial boiling point less than or equal to 250°C. They are emitted as a gas from a liquid or solid and enter the surrounding air. VOCs are numerous and varied. They include both human-made and naturally occurring chemical compounds a common example is formaldehyde (CH20).

Studies have shown that the air indoors can have concentrations of VOCs many time higher than the outdoor air and changes to Building Regulations Approved Document L may continue to drive up VOC levels due to increased air tightness. See Figure 1 - VOC concentration. Studies have shown that ventilation systems are only about 30% effective at removing VOCs from the air indoors.

Did you know?

ACTIV*air* technology has already been used in upgrade projects such as St. Mary's hospital in Kettering and has been tested on site to prove a reduction in formaldehyde.

Indoor air quality

Some of the health problems VOCs can cause

People often complain about health problems after extended periods of time spent indoors. Studies have shown that many of these symptoms can be attributed to VOCs

- Headaches
- Nausea
- Lack of concentration
- Eye irritation
- Fatigue
- Breathing problems

You can't see VOCs, or smell them. Therefore there is no way of knowing what concentrations you are being exposed to on a daily basis.

Building regulations and guidance relating to VOCs

All current regulation focuses on VOC emissions at project handover, and in reducing the VOC content of construction products.

However, academic and evidence based design is increasingly highlighting that the major issue with VOCs is post handover / during building use.

Building regulations and guidance relating to VOCs:

- Building Regulations Approval Document F (ventilation)
- Building Bulletin 101 (education)
- BRE Digest 464 Part 2
- BREEAM (indoor air quality)
- LEED (indoor air quality)

ACTIV*air* technology

ACTIV*air* is a new technology added to certain British Gypsum products. It is designed specially to decompose formaldehyde, a common VOC, into non-harmful inert compounds, thus eliminating the risk of re-emission. See Figure 2 - **ACTIV*air*** technology.

Improving the indoor air quality is a major consideration amongst clients and building occupants, most notably those concerned with sustainability and health and wellbeing. Good clean air can reduce health problems as well as enhancing our healthy living in both our work and living spaces.

ACTIV*air*:

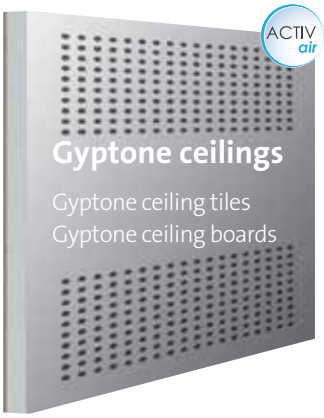
- Decomposes up to 70% of the formaldehyde concentration in the indoor air *1*.
- Uniquely captures and converts formaldehyde
- Will continue to work for at least 50 years
- Poses no risk of re-emission even if the product is damaged or at end of life
- Works though a breathable paint finish
- Is fully recyclable through the British Gypsum closed loop Plasterboard Recycling Scheme (PRS)
- Has no impact on the installation or performance of the products or systems they are included in with regards to fire, acoustics, thermal or durability compared to standard versions of the products

1 In a controlled environment

The effectiveness of **ACTIV*air*** technology has been tested by the accredited Eurofins and VITO laboratories to ISO 16000-23. The test shows that **ACTIV*air*** decomposes 70% of the formaldehyde in a controlled test environment. See Figure 3 – **ACTIV*air*** test principle.

When using **ACTIV*air*** products in a project it is advisable to aim to have coverage in each room on the walls and/or ceiling equivalent to the m² area of the floor.

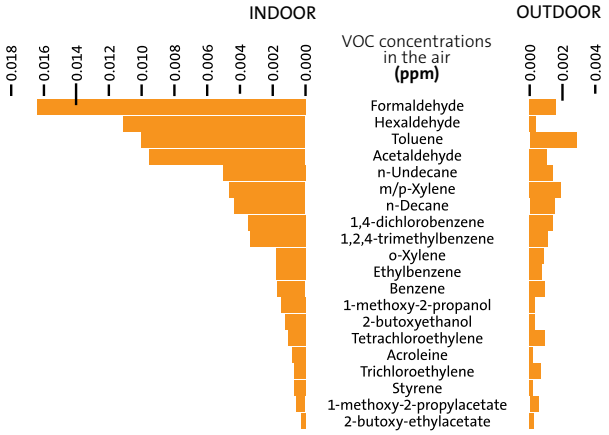
ACTIV*air* technology is available in Gyproc DuraLine, Gyproc SoundBloc and Rigidur H plasterboards, Thistle PureFinish plaster and Gyptone ceiling products.



NB Please note **ACTIV*air*** technology is an optional additive in plasterboard. Gyproc DuraLine, Gyproc SoundBloc and Rigidur H are also available as standard products

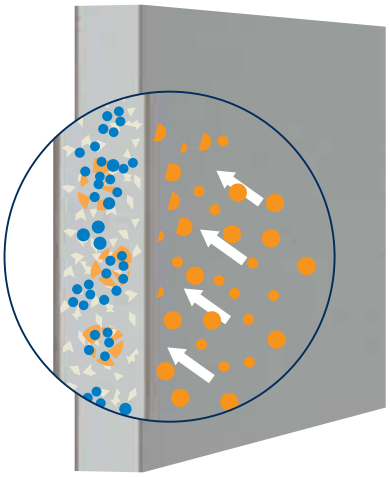
Indoor air quality

1 VOC concentration comparison, indoor vs outdoor



Source: Indoor Air Quality Observatory (OQAI)

2 **ACTIV*air*** technology

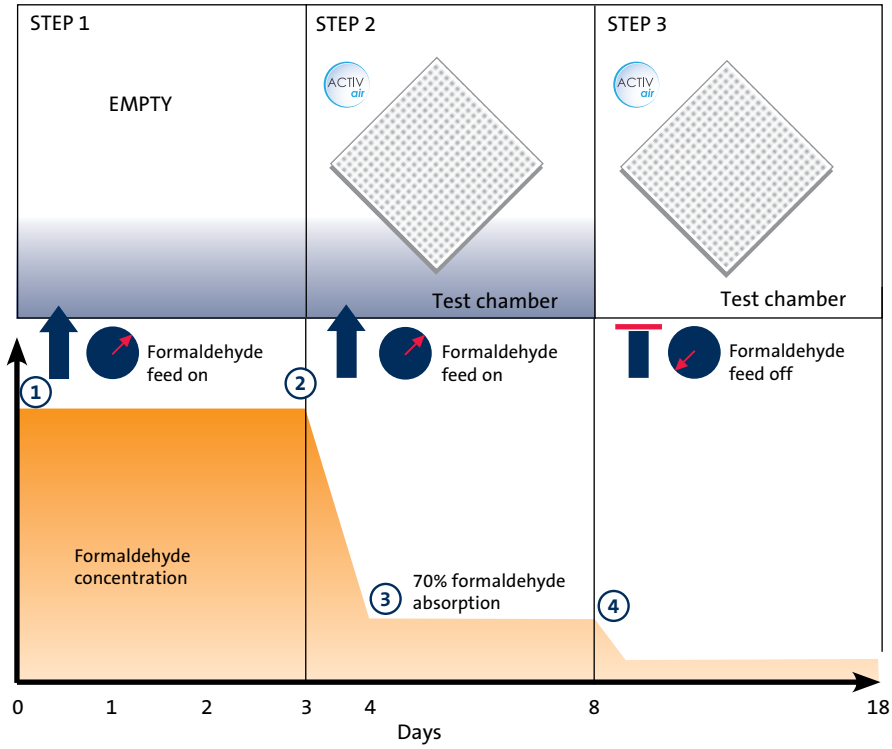


1. Formaldehyde molecules (●) in the air are absorbed by the plasterboard

2. ACTIV*air* technology (▼) converts them into inert compounds

3. The inert compounds (●) remain locked in the plasterboard

3 **ACTIV*air*** test principle



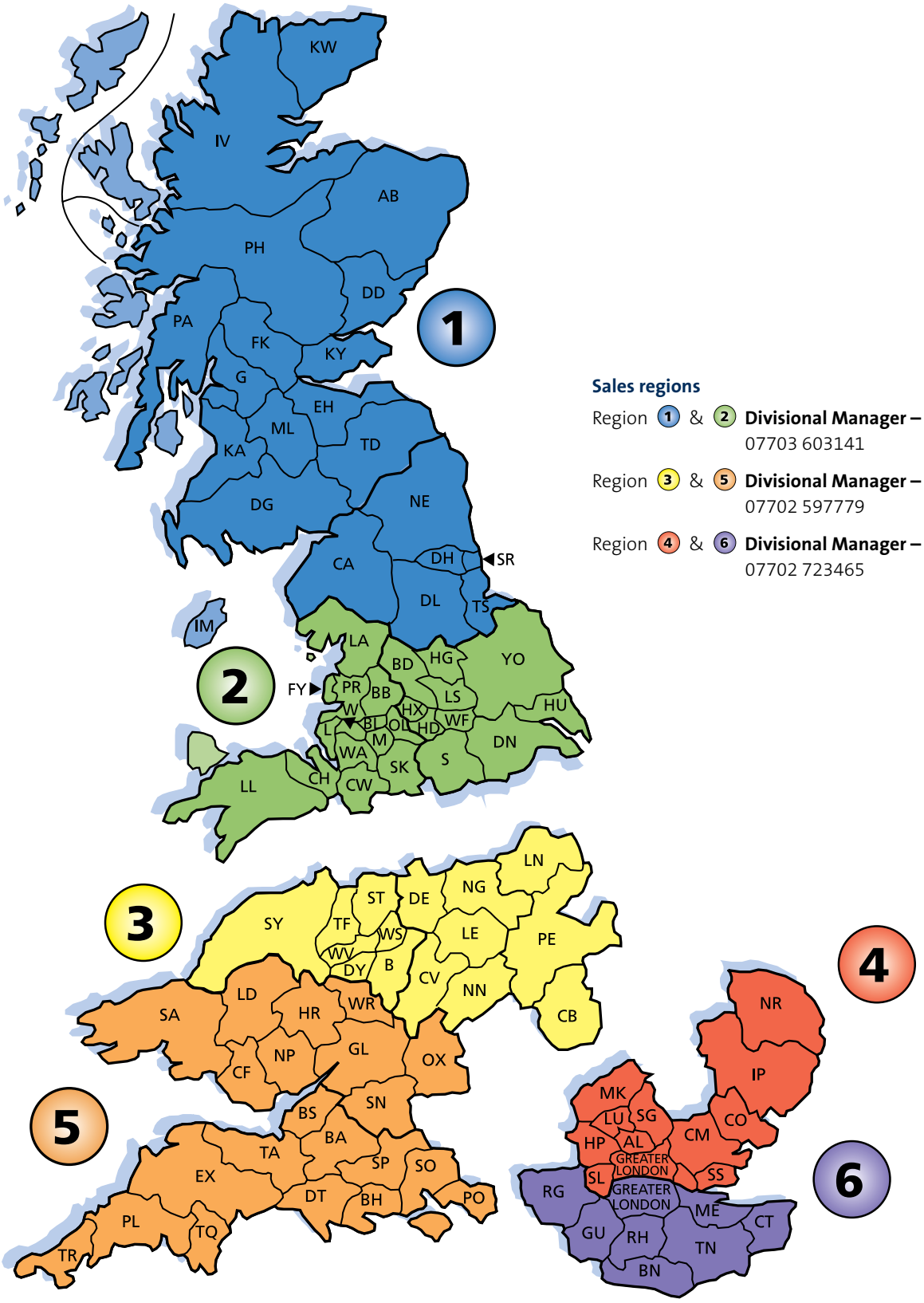
1 Formaldehyde was fed into the empty test chamber at a constant level

2 On day 3, a sample of a product containing **ACTIV*air*** technology was introduced to the test chamber

3 After 24 hours, **ACTIV*air*** technology had absorbed 70% of the formaldehyde in the chamber, with a continued in-feed of formaldehyde

4 Formaldehyde feed was stopped on day 8, and levels were further reduced as they continued to be absorbed by **ACTIV*air*** technology

Please contact your Divisional Manager – RMI, who will be happy to access the wide range of British Gypsum resources for you.



Sales regions

Region 1 & 2 **Divisional Manager – RMI**
07703 603141

Region 3 & 5 **Divisional Manager – RMI**
07702 597779

Region 4 & 6 **Divisional Manager – RMI**
07702 723465

Index

Technical enquiries
British Gypsum
Technical Advice Centre
East Leake
Loughborough
Leicestershire
LE12 6HX

Telephone: 0844 800 1991
Fax: 0844 561 8816
Email: bgtechnical.enquiries@bpb.com

Training enquiries: 0844 561 8810

British Gypsum July 2015 BG-RMI-SG-15-01

british-gypsum.com

SAINT-GOBAIN