



Partition solutions for schools



Hydropanel

the partition solution for schools





Educational establishments are usually heavy use, high impact environments which require, durable and long lasting walls that are also easy to maintain, flexible enough to incorporate insulation and allow for movement of wall mounted items.

Hydropanel offers everything you would expect from a high performance partition wall – versatility in design, acoustic and thermal insulation, fire resistance and excels in three key areas:



Exceptional impact resistance

Hydropanel is 4 times stronger than standard gypsum plasterboard.

12mm Hydropanel achieves 400N soft body impact tests compared with 100N for 12mm gypsum plasterboard.

See page 6.

Excellent load bearing

Up to 200kg load per fixing for 12mm Hydropanel compared to 48kg for standard plasterboard.

No need for timber noggins, saving construction time.

Movement of wall mounted items and reconfiguration is simple and quick without the need for modifications, making environments future proof.



See page 9.



Absolute moisture resistance

Hydropanel is totally water resistant and will not rot or warp.

No need to specify special panels for high moisture or wet areas.

Proven water-resistance every time.

See page 7.

The importance of partitions for educational establishments

The government-backed 'Building Schools for the Future' programme to rebuild or renew our educational infrastructure, is a project which places unique demands on the specifier, contractor and client, as well as offering immense opportunities.

With a systematic, rolling programme of procurement and construction, there are compelling arguments for the development and application of standardised specifications that can be used from project to project.

These are designed to offer the architect and contractor (and ultimately, the student) a guaranteed set of performance levels provided that they employ components which meet the stated criteria and provided that they are constructed properly.

The purpose of Partitions for Educational Buildings is to provide a range of these solutions to meet the varying criteria to be found in our schools, colleges and universities.

The solutions themselves have been devised by a forum of stakeholders drawn from the building, design, research, contracting and supply communities, as well as local authority construction clients.

Hydropanel's unique set of benefits and performance characteristics makes it a perfect choice for such solutions, giving designers and installers the flexibility and scope they need to create the very best educational environments.



The chain of legislation

The Building Regulations

Ultimately, all schools in England and Wales must comply with the Approved Documents of the Building Regulations. Those most relevant to partitions are:

Approved Document B

Fire Safety (Vol 2)

Approved Document E

Resistance to the Passage of Sound

Approved Document G

Hygiene



Primary guidance

In practice, key guidance is offered to satisfy the acoustic needs of schools and their fire resistance requirement. Constructions which satisfy the performance levels set out in these documents will be deemed to satisfy the Building Regulations. The guidance documents are:

Building Bulletin 93 – Acoustic Design of Schools

Also known as BB93, published by the DfES.



Part E states:

'In the Secretary of State's view, the normal way of satisfying requirement E4 (Acoustic conditions in schools) will be to meet the values for sound insulation, reverberation time and internal ambient noise which are given in Section 1 of BB93...'

Building Bulletin 100 – Design for Fire Safety in Schools

Also known as BB100, which states:



'Sections 3-8 provide detailed design guidance that, if followed, will usually enable the school design to satisfy the requirements B1-B5 of the Building Regulations.'



Secondary guidance

Partitions in Schools

This guidance sets out the standards of performance necessary for internal partitions in schools complying with the Building Schools for the Future programme (BSF) and shows how they might be delivered through some design examples.

The guidance formulates best practice examples that can be used throughout a range of school environments to deliver guaranteed performance levels.



Partitions in Schools states:

'To help encourage the take up of these performance specifications and design examples, this guidance will become the standard in BSF programme documentation and the Government will expect it to be adopted in the majority of situations, where it is reasonable and appropriate to do so.'

Satisfying legislation, complying with guidance



Hydropanel is a robust, durable, inert, hygienic, moisture-resistant board, with fire resisting properties.

Manufactured from fibre cement in ISO 14001 facilities to the highest levels of tolerance, Hydropanel has the absolute consistency required to achieve proven (and independently tested) performance levels.

Additionally, it is dry fixed, easy to handle and work, simple and rapidly installed using standard skill sets.

Finally, it is impact-resistant and acoustically absorbent, with excellent pull-out strength and manufactured using sustainable processes.

This range of benefits and characteristics makes Hydropanel the ideal component for Partitions for Educational Building solutions where specific performance and simplicity of installation are fundamental criteria.

- Impact resistant – maintenance free
- Excellent 'pull-out' strength
- 100% moisture resistant
- Suitable for wide range of decorative finishes
- Hygienic and inert

Hydropanel: structural performance

In general, all educational buildings are particularly sensitive to damage. Separating partitions in corridors receive extremely rough treatment from students and must endure a lifetime of deliberate and accidental impact whilst keeping expenditure and maintenance cycles to an absolute minimum. It is paramount that all internal areas withstand sustained high levels of use and impact as well as being able to maintain their aesthetic and performance criteria.

Hydropanel 12mm board has been tested to British Standard BS 5234-2: 1992 that defines the strength and robustness of partitions as follows:

- Hydropanel is immensely strong and extremely resistant to impact during transport, installation and most importantly, in use.
- Hydropanel reinforces the building's structure providing safety and comfort in demanding, high-traffic areas and combines superb levels of impact resistance with minimal maintenance costs over the expected lifetime of the educational establishment.
- These exceptional levels of performance are maintained by Hydropanel in wet areas, such as swimming pools, changing areas and toilets. Hydropanel does not distort or rot, or lose its strength even when exposed to the wettest conditions.

Grade	Category of duty	Examples
Light Duty (LD)	Adjacent space only accessible to persons with high incentive to exercise care. Small chance of accident occurring or of misuse.	Staff accommodation
Medium Duty (MD)	Adjacent space moderately used primarily by persons with some incentive to exercise care. Some chance of accident occurring or of misuse.	Head teacher's office
Heavy Duty (HD)	Adjacent space frequently used by the public and others with little incentive to exercise care. Chances of accident occurring and of misuse.	Classrooms
Severe Duty (SD)	Adjacent space intensively used by the public and others with little incentive to exercise care. Prone to vandalism and abnormally rough use.	Corridor, stairwells and toilets

All school partitions are required to have a Severe Duty (SD) rating.

Hydropanel: hygrothermal performance

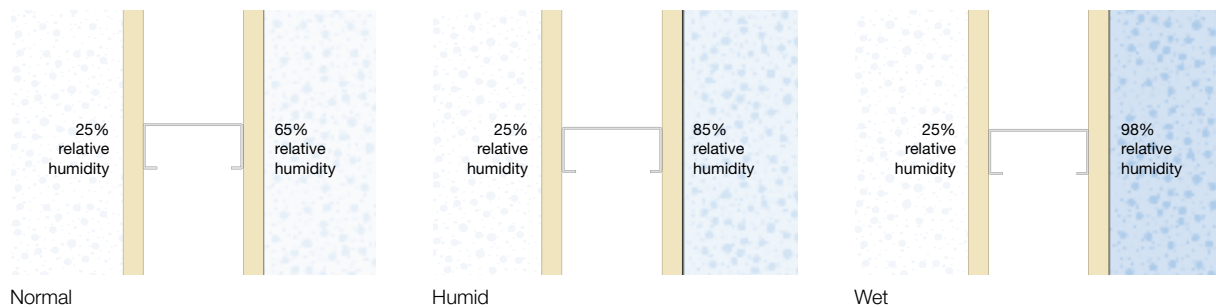
It is imperative that surface finishes of partition walls within educational buildings should withstand surface condensation or local splashing of water. Furthermore, many areas have increased water resistance requirements i.e. shower rooms, kitchens and indoor pools and those areas where floors are liable to be washed with water.

Partitions must not contain materials that could be detrimental to the health and safety of users – by direct contact or otherwise. They should be designed and constructed to avoid accumulations of dirt, attack or infestation by micro-organisms, fungi or insects. Exposed surfaces should be capable of withstanding their routine wet cleaning with mild detergents or disinfectants, without deterioration, discolouration or loss of performance.

Hydropanel is totally water resistant. It does not deform, crack or disintegrate. It is rot-proof, frost-proof and resists mould, bacteria, insects and vermin. The perfect solution for Educational buildings.

A partition may be required to resist wet or humid conditions on one side or part of one side, with dry conditions on the opposite side. The component materials will need to withstand the corrosive or degrading effects of atmospheric humidity within the range 25% or 98% relative humidity, as designated below.

Humidity differential categories



Satisfying legislation, complying with guidance

Hydropanel: acoustic performance

Speech intelligibility is critical to the learning process – it helps teachers and students communicate clearly and improve study activities, if students cannot clearly understand the teacher – or vice versa – due to poor acoustic design, the learning process will be impaired.

The sound insulation between rooms should be calculated in accordance with Section 1 of Building Bulletin 93 (BB93) as required for Building Control approval.

Building Bulletin 93 'Acoustic Design of Schools'

BB93 sets the performance standards for the acoustics of new school buildings and describes the normal means of demonstrating compliance with the Building Regulations.

Table 1 has been created using data from BB93, and describes the minimum weighted standardised level difference $D_{nT}(\overline{T}_{mf,max},w)$ (dB) between rooms. The sound insulation required between rooms is determined from two factors:

- 1 The noise tolerance of the room as a 'receiving' room – its sensitivity to incoming noise
- 2 The activity noise the room creates as a 'service' room

So, two 'quiet' rooms side by side will have a lower airborne sound insulation requirement between them than a quiet room next to a music room.

The relationship between $D_{nT}(\overline{T}_{mf,max},w)$ and D_{nT_W} is dependent upon the required reverberation time in the receiving room. For most teaching rooms $D_{nT_W} = D_{nT}(\overline{T}_{mf,max},w) + 2/3\text{dB}$, though for rooms requiring higher reverberation times, such as gymnasiums and music performance rooms, the relationship can be as high as $D_{nT_W} = D_{nT}(\overline{T}_{mf,max},w) + 5\text{dB}$.

Table 1

	Nursery Play room	Nursery Quiet room	Primary/Secondary Classroom	Open Plan Teaching/Resource Area	Music Classroom	Music Performance Room	Lecture Room (Fewer than 50)	Lecture Room (More than 50)	Science Laboratory	Drama Studio	Assembly Hall	Gymnasium	Dining Room
Nursery Play room	55												
Nursery Quiet room	55	40											
Primary/Secondary Classroom	55	45	45										
Open Plan Teaching/Resource Area	50	45	45	40									
Music Classroom	55	55	55	55	55								
Music Performance Room	55	55	55	55	60	60							
Lecture Room (Fewer than 50)	55	45	45	45	55	55	45						
Lecture Room (More than 50)	55	45	50	50	60	60	50	50					
Science Laboratory	50	45	45	40	55	55	55	50	40				
Drama Studio	55	55	55	50	60	60	55	55	50	55			
Assembly Hall	55	55	55	50	55	55	55	55	50	55	55		
Gymnasium	55	55	55	50	55	55	55	55	50	55	55	50	
Dining Room	55	55	55	50	55	55	55	55	50	55	55	50	45

Due to their high density, separating wall systems with Hydropanel have very good airborne sound insulation properties. Different constructions have been tested according to EN ISO 140-3:1995.

Various partition categories are shown on pages 11-17.



Hydropanel: fire resistance

Student and staff safety is critical in the education sector and all systems must meet the requirements of the Building Regulations Fire Safety Approved Document B and BB100 Design for Fire Safety in Schools.

The main objective of compartmentation in schools is to reduce the potential for fire and smoke to develop and spread from the room where the fire started.

The partition fire ratings for each particular room type should not be taken in isolation. If the adjoining room has a fire resistance or is a protected stair/fire escape route, or the partition forms a fire compartment, then the partition must be appropriately fire rated. In all cases, the most onerous fire rating must be applied to the partition.

A number of fire hazard rooms (or rooms of significant value to the school if the contents were lost due to fire) together with fire escape routes, have a performance requirement of either 30 or 60 minutes fire protection from both sides and should be taken full height to the underside of floor slabs or roof soffits.

Hydropanel: pull down performance

Within an educational environment many fixtures and fittings are secured to a partition or lining within classrooms, sports halls and changing rooms, and are vulnerable to extreme loads. As a consequence, the wall should have the minimum capability to support the following applied loads:

- Pull out requirement – 100N
- Pull down requirement – 250N

Hydropanel has remarkably high load-bearing ability and can carry loads of up to 200kg per fixing with a factor of safety of 4. This outstanding property eliminates the requirement for noggins or ply-backing. This provides substantial cost saving on materials and installation time in addition to future proofing wall panels. This gives the client the flexibility of re-fixing items anywhere on the panels' surface, should re-configuration be required.



Partitions in education: solutions

Key criteria summary

Structural

Partitions to be 'severe' duty (BAS 5234-2: Table1).

Support of fixtures and fittings

Pull out: 100N

Pull down: 250N

Maximum heights: according to manufacturer recommendation.

Hygrothermal

All areas within a school are designated normal, humid or wet according to the table below:

	One side	Opposite side
Normal	25% RH at 10°C	65% RH at 25°C
Humid	25% RH at 10°C	85% RH at 25°C
Wet	25% RH at 10°C	98% RH at 25°C

According to designation, a partition will need to withstand the effects of the humidity differential.

Resistance to water/water vapour

Withstand condensation and/or local splashing 'wet' partitions impervious to 30 minutes (max) standing water on adjacent floor surface.

Thermal transmittance

Should achieve min U-value of 0.35 W/m²K.

Acoustic

As set out in BB93 tables 1.1, 1.2, 1.3, 1.4 and 1.5.

Fire

All partitions should reduce potential for fire and smoke to develop.

Requirements as set out in Approved Document B.

Surface finish

To be sufficiently robust to perform necessary decorative and/or protective function. Light reflectance of partition or lining surfaces generally to be not less than 55%.

Hygiene

Contain no materials detrimental to health or safety of users.

Avoid dirt, attachment or infestation of micro-organisms, fungi or insects.

Durability

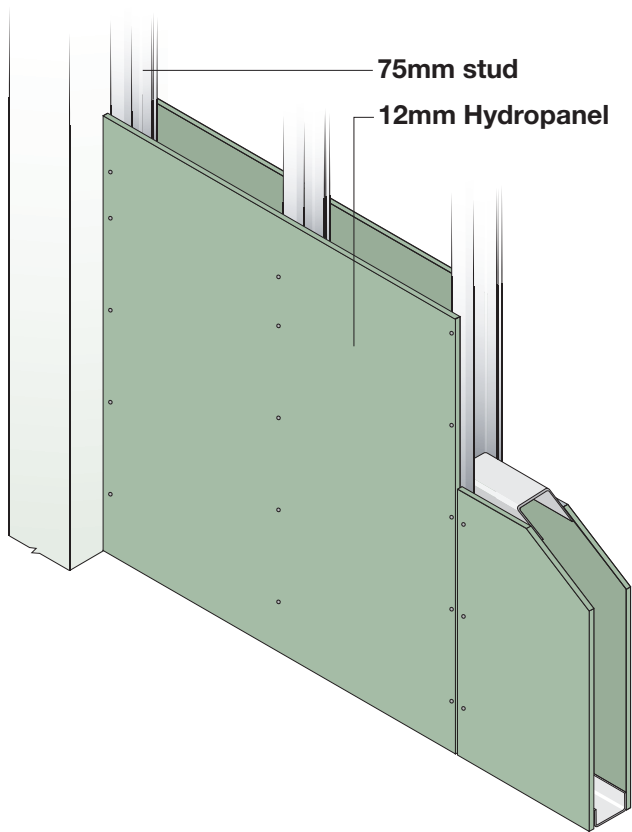
Perform satisfactorily according to specific use for period of 60 years.

Sustainability

Where possible, to be at least A rated in BRE Green Guide.



Partition Wall Type A



30
minutes
fire resistance
from either side

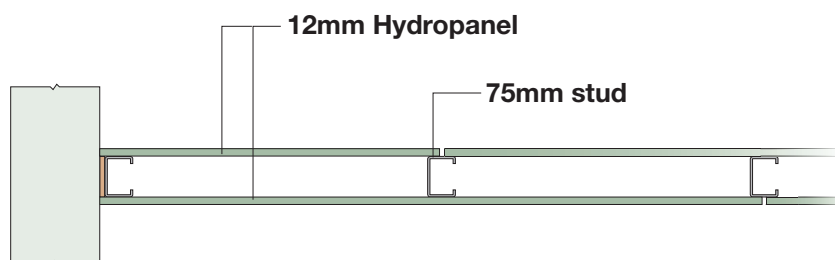
43dB
sound
resistance

S
severe duty
applications

W
suitable for
wet areas

System summary

Stud size	Protector Metal 75mm stud
Board thickness	12mm both sides
Insulation thickness	None
Total wall thickness	99mm
Acoustic value	43dB
Fire rating	30 minutes



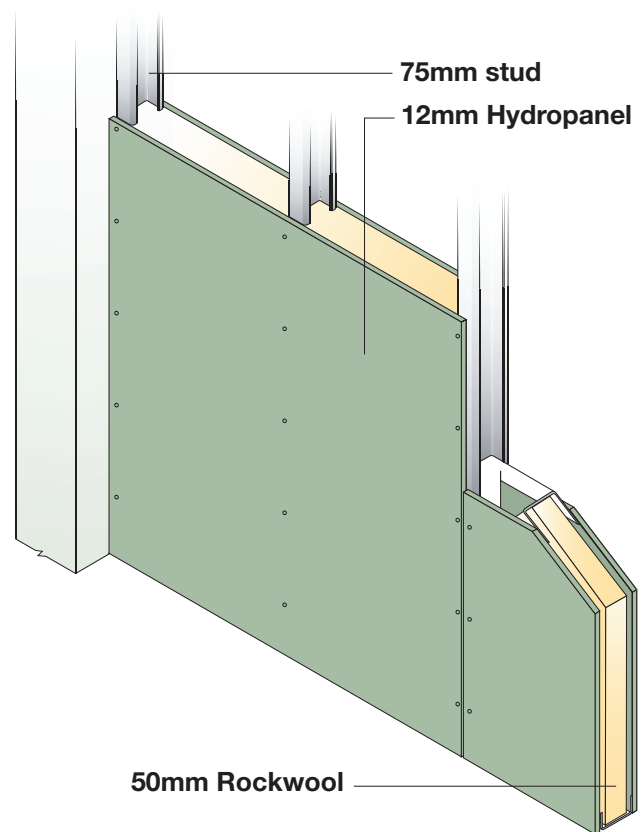
Partition Wall Type B

60
minutes
fire resistance
from either side

48dB
sound
resistance

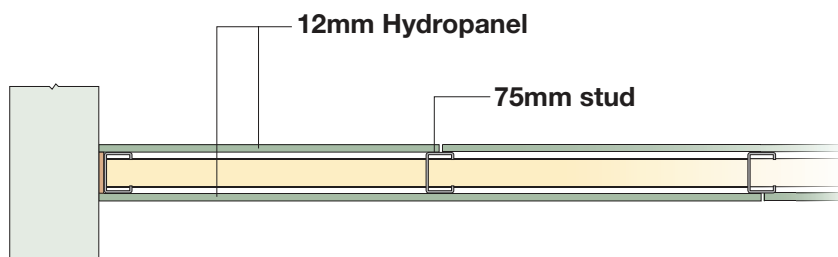
S
severe duty
applications

W
suitable for
wet areas

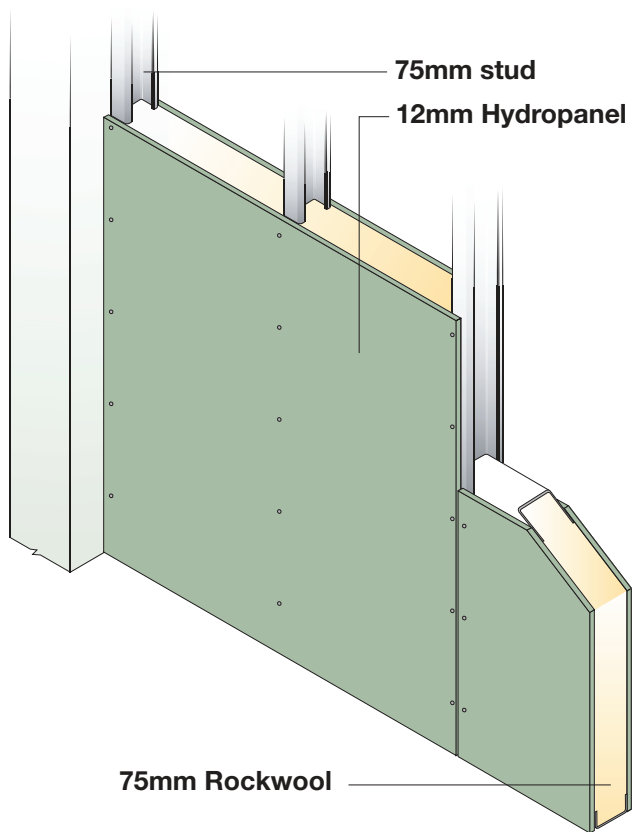


System summary

Stud size	Protector Metal 75mm stud
Board thickness	12mm both sides
Insulation thickness	50mm Rockwool
Total wall thickness	99mm
Acoustic value	48dB
Fire rating	60 minutes



Partition Wall Type C-1



60
minutes
fire resistance
from either side

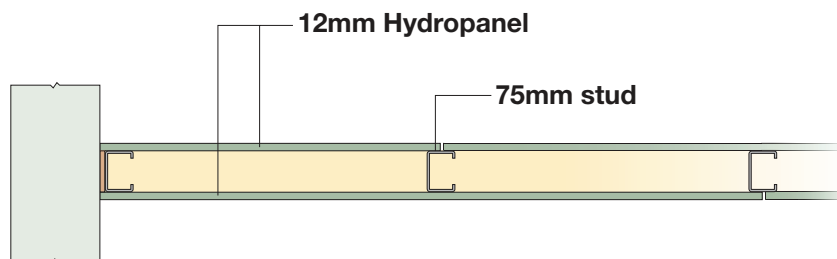
54dB
sound
resistance

S
severe duty
applications

W
suitable for
wet areas

System summary

Stud size	Protektor Metal 75mm stud
Board thickness	12mm both sides
Insulation thickness	75mm Rockwool
Total wall thickness	99mm
Acoustic value	54dB
Fire rating	60 minutes



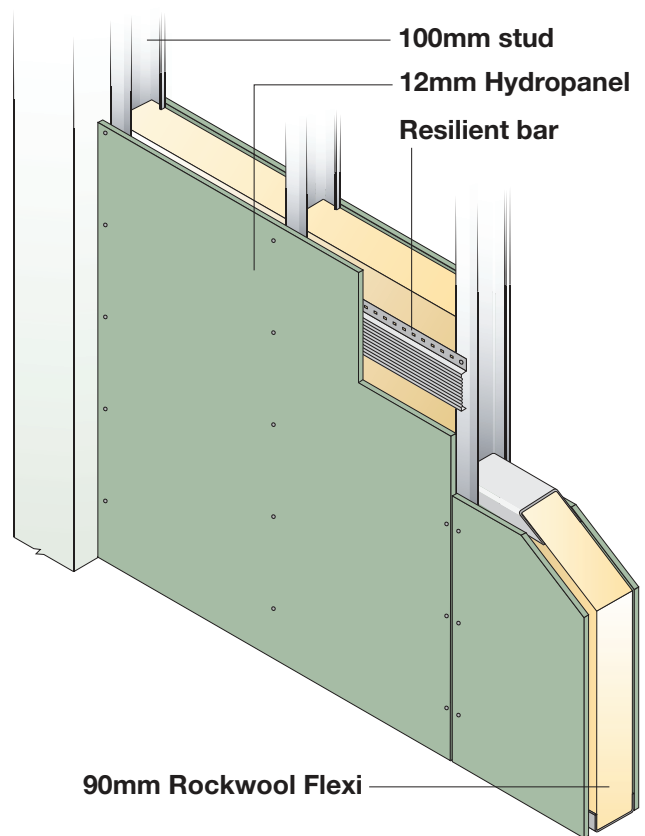
Partition Wall Type C-2

60
minutes
fire resistance
from either side

56dB
sound
resistance

S
severe duty
applications

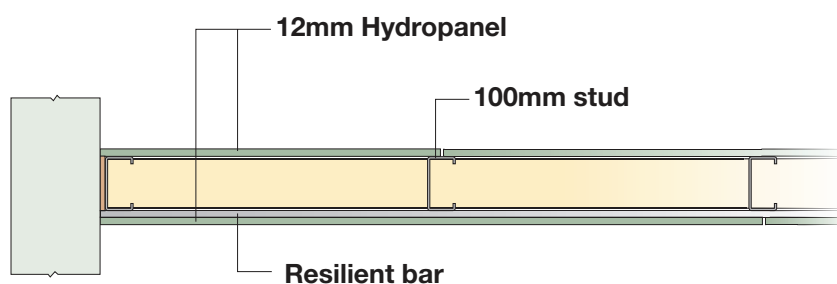
W
suitable for
wet areas



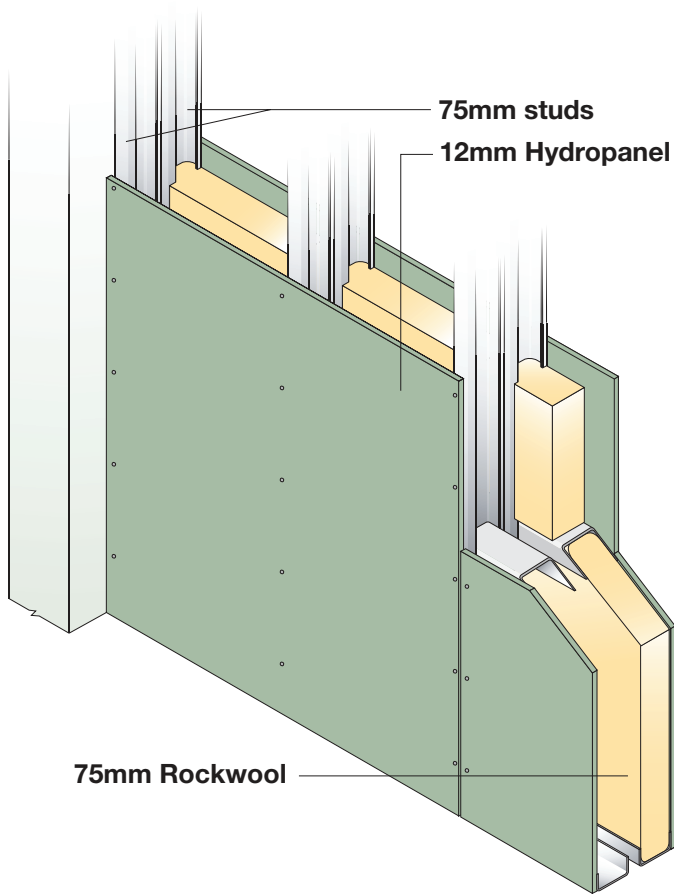
System summary

Stud size	100mm Acoustic Protektor stud*
Board thickness	12mm both sides
Insulation thickness	90mm Rockwool Flexi
Total wall thickness	138mm
Acoustic value	56dB
Fire rating	60 minutes

* plus resilient bar one side at 600mm centres and felt strip



Partition Wall Type D



60
minutes
fire resistance
from either side

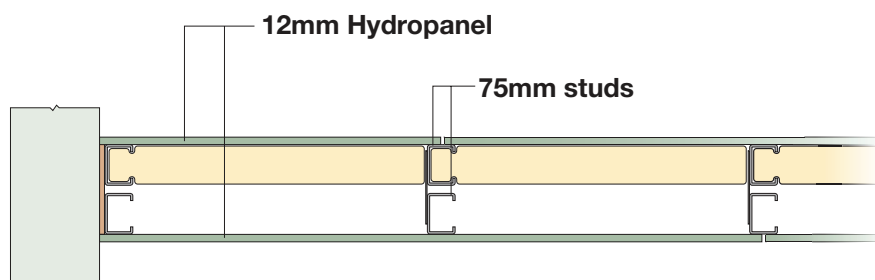
62dB
sound
resistance

S
severe duty
applications

W
suitable for
wet areas

System summary

Stud size	2 x Protektor Metal 75mm stud
Board thickness	12mm both sides
Insulation thickness	75mm Rockwool
Total wall thickness	174mm
Acoustic value	62dB
Fire rating	60 minutes



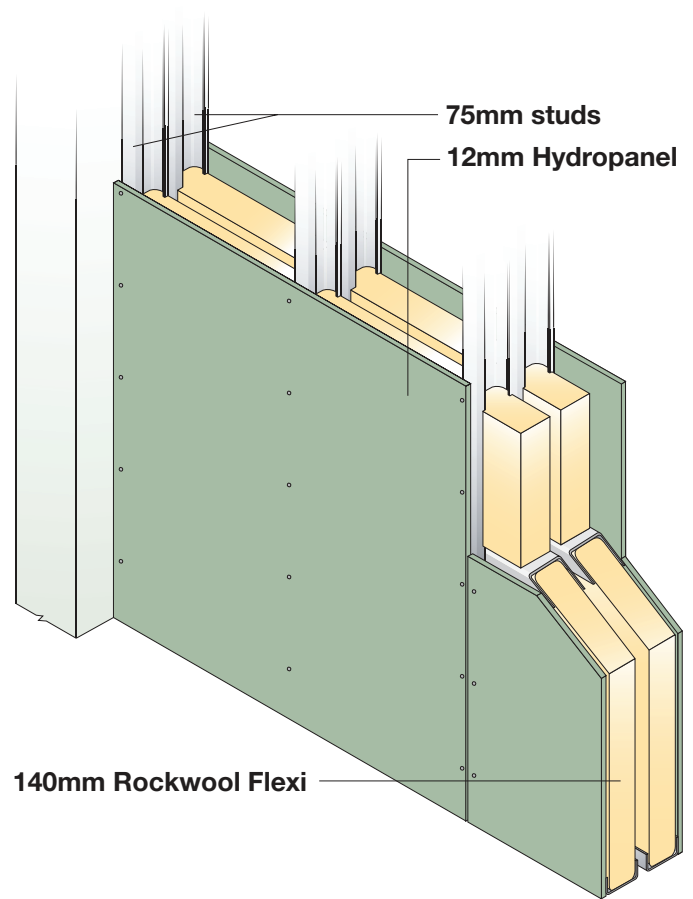
Partition Wall Type E-1

60
minutes
fire resistance
from either side

64dB
sound
resistance

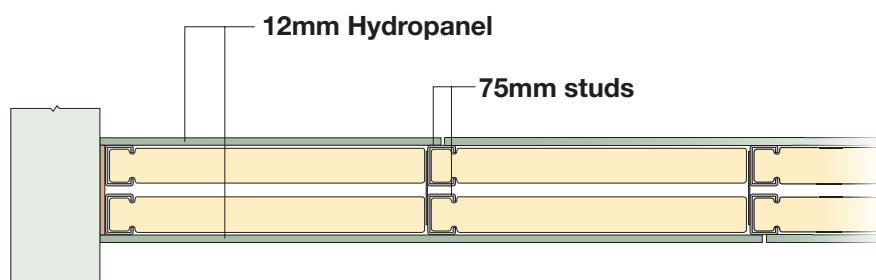
S
severe duty
applications

W
suitable for
wet areas

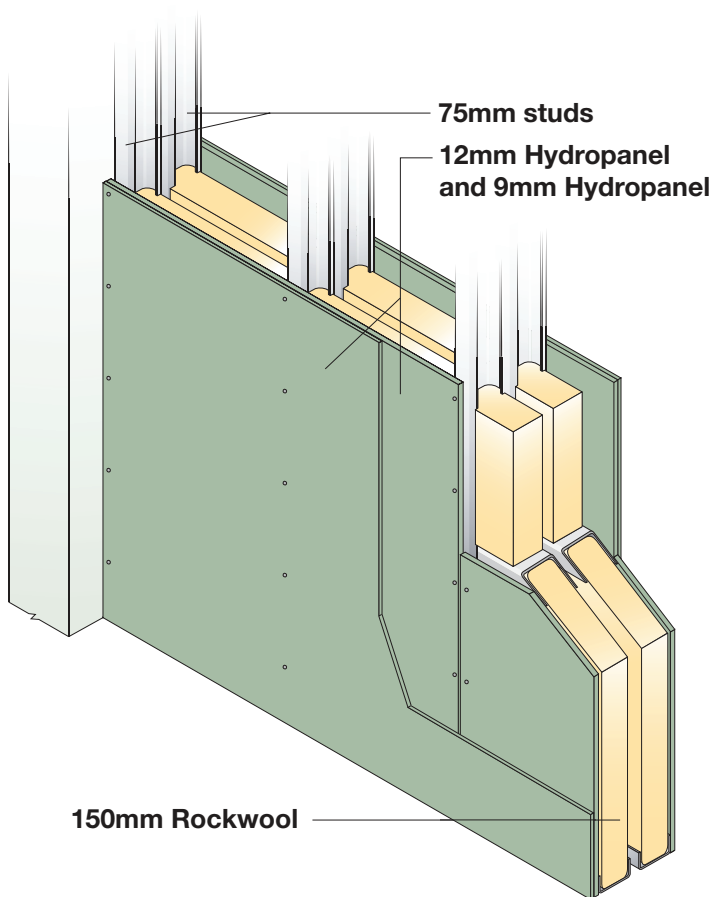


System summary

Stud size	2 x Protektor Metal 75mm stud
Board thickness	12mm both sides
Insulation thickness	2 x 70mm Rockwool Flexi
Total wall thickness	184mm
Acoustic value	64dB
Fire rating	60 minutes



Partition Wall Type E-2



120
minutes
fire resistance
from either side

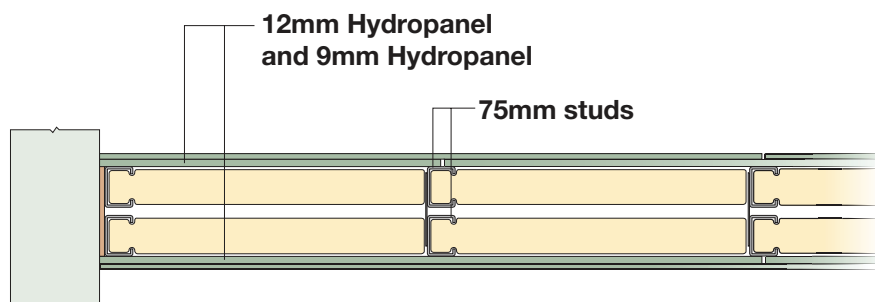
68dB
sound
resistance

S
severe duty
applications

W
suitable for
wet areas

System summary

Stud size	2 x Protektor Metal 75mm stud
Board thickness	9mm + 12mm both sides
Insulation thickness	2 x 75mm Rockwool
Total wall thickness	192mm
Acoustic value	68dB
Fire rating	120 minutes



National information

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Services



Customer Services

Marley Eternit is committed to providing outstanding customer care and is staffed by experienced personnel in departments dedicated to providing the following services:

Advice, literature and samples

→ All current product and technical literature can be downloaded from www.hydropanel.co.uk

To request samples and advice:

→ **T** 01283 722588 **E** hydropanel@marleyeternit.co.uk

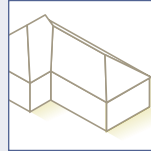
Quotations and ordering information

→ **T** 01283 722894 **E** hydropanel@marleyeternit.co.uk

Stockist information

To find details for stockists of Marley Eternit products:

→ **T** 01283 722588 **E** hydropanel@marleyeternit.co.uk



Technical Advisory Service

Marley Eternit provides a free Technical Advisory Service which is staffed by personnel with specialist knowledge of the use of all Marley Eternit products and systems.

To request Technical Advice:

→ **T** 01283 722588

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→ www.marleyeternit.co.uk **T** 01283 722588

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