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November 2021



Kemwell Impact Board

A1 Non-combustible high performance fire, blast and impact protection board for critical applications in the commercial, industrial, transport and energy sectors



SAVING LIVES | PROTECTING BUILDINGS & CONTENTS | MAINTAINING VITAL SERVICES

PASSIVE FIRE PROTECTION

Specialists for the construction, infrastructure, transport, energy, industrial and commercial sectors.

www.kemwell-fire.com



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High Performance non-combustible Fire, Blast and Impact Protection System

Kemwell Impact Board is a non-combustible fire, blast and impact protection board and barrier system used for critical internal and external applications in the commercial, industrial, transport and energy sectors.

The consequences of fire, blast or impact are often catastrophic, but they can be reduced and managed with a correctly designed and installed fire safety and protection system in place. Kemwell Impact Board plays a crucial role in providing protection to people, buildings, services, businesses, and the environment.

Impact Board systems are typically used for the construction of walls and stand-alone barriers, ceilings, roofs, stairwells and ductwork or cable protection.

Impact Board combines lightness, strength, impact, blast resistance and durability with exceptional fire resistance, ensuring continued protection. Kemwell Impact Board will withstand an explosion, followed by prolonged fire, and will be unaffected by firefighters' hoses or sprinkler systems.

It is a tested, proven and certified solution, maintaining structural integrity and providing 4 hours' fire containment in the event of a fire.

You can specify Kemwell Impact Board with confidence.



KEY SYSTEM BENEFITS

- Non-combustible and up to 4 hours' fire protection
- Hydrocarbon fire resistance
- Blast resistant
- High level of impact resistance
- Moisture and hose-stream resistance
- Minimal smoke or toxic gas in a fire
- Internal and external standard and bespoke applications
- Lightweight and does not require foundations
- Slim, space-saving profile
- Good acoustic insulation and low sound transmission performance
- Demountable, easily relocatable and suitable for retro-installation
- Mechanical or seismic vibration resistant

COMPOSITION

Kemwell Fire Impact Board is a composite board manufactured with a fibre reinforced environmentally friendly cement core, with outer facings of perforated galvanised steel, mechanically bonded to both outer surfaces.

The construction means the boards are exceptionally robust for harsh industrial and public environments.

Other steel finishes, such as, stainless steel are available for use where greater resistance to corrosion is required.

SUPPORT

The Kemwell project team provides expert support services throughout all stages of any construction project, including:

- Technical advice
- Supply of data sheets and certification
- Product selection and application consultation
- Site-visits
- Installation advice

Our years of experience will ensure customers have a fit-for-purpose system and a certified installation for their Kemwell Impact Board project.

After a site survey, our approved installers will provide fully designed working drawings. We will also supply the fire resisting sheets, doors and penetration seals, providing a single source of responsibility and supply.

All elements are tested as a complete system to ensure compatibility and one source of warranty. Access panels for maintenance or fire stopping of penetrations through the barrier are also included in the system estimate.

Experienced and fully qualified licenced installers will install Kemwell Impact Board systems and once the work is complete, the system undergoes a thorough check before being issued with a Certificate of Conformity.

Please contact us to discuss your project or requirements further.

T: +44 (0)333 344 0699 (UK)

T: +353 (0)1 565 3756 (Ireland)

E: info@kemwell-fire.com



KEY CUSTOMER BENEFITS

- Tested to comply to UK and international standards
- Technical experience
- Insurance industry recognition
- FIRAS accredited and fully qualified licenced installer specialists
- Guaranteed system with full certificate of conformity
- Certifire independent third party certification
- Tested with a range of service penetrations and fire doors
- High speed installation
- Maintenance free with over 40 years' service life

APPLICATIONS

- Blast resistant transformer barriers
- Ceilings and plenum ceilings
- Electrical and mechanical services enclosures
- Fire and blast resistant walls and hoardings
- Fire rated impact resistant doors
- Hydrocarbon fire resistant barriers
- Hazardous materials vaults
- Impact resistant barriers and spandrels
- Loadbearing floors, roofs and access panels
- Ventilation, smoke outlet and kitchen extract ductwork
- Vertical shaft systems

SECTORS

- Energy and Power Generation
- Petrochemical
- Transportation
- Factories and Warehousing
- Hospitals
- Hotels and restaurants
- Banking and financial
- Government and public buildings
- Security vaults
- Communication centres
- Retail, sports and leisure
- High-rise commercial buildings





FEATURES



Fire Resistance

Kemwell Impact Board provides exceptional fire protection and is classed as non-combustible to BS 476: Part 4: 1970, BS EN 1716: 2010, BS EN 1182: 2010 and A1 to Clause 10 of BS EN 13501- 1:2002. Euro Class A1 and A1FL

Building Regulations stipulate minimum periods of fire protection required to the elements of a building's structure. In the severest of situations, when protection is needed for up to 4 hours integrity and insulation, Kemwell Impact Board has been tested to meet this criteria in accordance with the requirements of BS476: Part 22:1987 and BS 476: Part 20-24 BS EN 1364-1 & 2.

It also provides up to 3 hours for hydrocarbon fire barriers.

Kemwell Impact Board systems are tested to H0, H60 and H120 fire rating for hydrocarbon fire resistance post-blast.



Moisture and Weather Resistant

Kemwell Impact Board provides exceptional resistance to the harmful effects of excessive weather and performance is also unaffected by the use of fire-fighters hoses and sprinkler systems.



Dimensional Stability and Strength

Kemwell Impact Board is an exceptional strong and stable product. It is tested from 0.3 to 2 bar over pressure for blast resistance and meets the requirements of BS EN 1128 for heavy impact resistance.

Due to this stability and strength, it ensures that if the boards are subject to high levels of fire, moisture, blast or impact, they will continue to provide the levels of protection required for the application in question.



Acoustic and Thermal Benefits

Boards have the benefit of providing low sound transmission and good acoustic insulation performance. Thermal conductivity is 0.55 W/m K at 20°C.

Estimated sound reduction 33dB (E240 single sided partition eg. detail 1 page 12). Estimated sound reduction 50dB (E1240 double sided partition eg. detail 2 page 12)



Easy Workability

Kemwell Impact Boards are adaptable, slim, lightweight with a space saving profile and do not require foundations for installation. They are suitable for high-speed installation. Boards are fully demountable and relocatable, and suitable for retro-installation, unlike plasterboard or blockwork installations.



Chemical Stability

Kemwell Impact Board is a chemically stable board, unaffected by many diluted chemicals, as well as the harmful effects of weathering and pollutants.



Surface

Kemwell Impact Board is self-finished in either galvanised or stainless steel, requiring no decoration.

If decoration is required, boards should be de-greased with a solvent based cleaning agent before any form of decoration is applied. For painting a Zinc Phosphate Primer is required and you should seek paint manufacturers recommendations.



Durability

Impact Board is a robust and maintenance free 'fit and forget' system even in severe situations and has an expected service life of at least 40 years. The fibre reinforced cement core is environmental friendly with a low carbon footprint.



Vermin Resistant

Kemwell Impact Board is immune to attack from insects or vermin.

Insulated Fire Wall

Fire walls are used in constructions where the criteria of stability, integrity and insulation are required during fire.

Kemwell Impact Board insulated fire walls are designed to prevent the passage of heat from a fully developed fire on the exposed face. Maximum permitted temperature rise allowable on the surface of the unexposed face is 140°C as a mean temperature over all the surface, or a maximum temperature of 180°C at any one point on the surface.

Insulated wall constructions should be used in areas where the following may occur:

- Escaping fire fighters or personnel may have contact with the wall surface
- If there are any volatile chemicals or materials stored within the vicinity of the fire wall and which may ignite at low temperatures
- There is a need to improve compartmentation beyond simple integrity.
- If used as a wall lining to escape routes, for instance as an access tunnel within a factory

There are a number of methods of constructing insulated wall systems, each option has its own benefits. The type of system, density and thickness of the rock wool and cover strips are all dependent on the fire and physical performance required from the system.

Fire Blast Wall

Specifically designed to protect personnel and equipment from the effects of fire, explosion, impact, and the effects of smoke and fumes in a hazardous environment, such as offshore platforms, petrochemical installations, chemical plants, military establishments, civil defence works and hazardous process plants.

Additional features of Kemwell Fire Blast fire and blast resistant walls:

- Blast resistant, tested from 0.3 to 2 bar over pressure
- Resistant to hydrocarbon fires, tested to H120
- High energy absorption

Unlike many blast and fire resistant materials, Kemwell Impact Board is non-combustible and will withstand an explosion followed by prolonged fire and still be unaffected by hose stream fire fighting. Its integrity remains unimpaired, ensuring continued protection against fire, impact and moisture as well as preventing the escape of smoke and toxic gases.

Kemwell Impact Board systems are tested up to H120 fire rating, and the systems can be designed to suit specific project performance requirements, and all fire blast walls are individually tailored to suit specific project requirements.



Hydrocarbon

Nuclear Fuel & Fossil Power Stations

In an industry where concerns for environmental protection coupled with the increasing demand for electricity, brings constant technology development in both conventional and new approaches to energy supply, only a system such as Kemwell Impact Board has the flexibility to match the need for innovative solutions. Kemwell Impact Board will withstand prolonged hydrocarbon fire, resists hose-stream fire-fighting, is non-combustible, impact and moisture resistant and does not emit toxic gases or smoke.

Offshore Oil & Gas Platforms

Being lightweight and strong Kemwell Impact Board is highly resistant to hydrocarbon fire, blast, impact, water and corrosion making our systems the ideal choice for fire protection on offshore production platforms and in potentially hazardous land-based environments.

High-Rise Buildings

Kemwell Impact Board is the first choice fire protection product for an impressively wide range of structures, including high-rise offices and hotels, airports, retail parks, leisure complexes, public buildings and government institutions.

Kemwell Impact Board has also undergone rigorous testing for use in electrical plant rooms and is an approved system for sub-stations with the various electricity companies, while also being approved and extensively used on the London Underground system.

Other Impact Board applications may be suitable in high-rise office blocks, e.g. fuel storage and boiler room enclosures, fire doors, curtain wall fire breaks and penetration seals, lift door transom panels and ceilings above lift shafts.

Airports

Every airport operator strives to provide the highest standard of safety in civil aviation and airport operation. The range of Kemwell Impact Board systems for airports are proven to meet or exceed the most rigorous British and International legislative requirements.



Fire Barrier Specifications

The steel of the channels must have a minimum yield stress of 350N/mm². The back-to-back channels are fastened together with M10 steel bolts and nuts at 500mm maximum centres. The vertical joints in the Impact Board should be offset by 30mm from the centreline of the back-to-back studs to avoid a straight through path for hot gases. The horizontal channels are single channels.

Insulated Partitions

The construction of the insulated double-skin Impact Board partitions is identical to the uninsulated single-skin partitions except for the following changes:

- A second skin of Impact Board, 9.5mm thick, is fitted to the opposite face of steel framework. The Impact Board is fastened with M5.5 Ejoyt steelself drill and tap screws at 300mm maximum centres.
- For some constructions Impact Board fillets are fitted over both faces of the channel members before the faces are fitted. The fillets must overlap the channels by at least 20mm on both sides.
- For 60, 120 and 240 minute insulation periods stone wool insulation is fitted in the cavity of the partition.
- The perimeter channels of the partition are fastened to the surrounding construction with M10 all steel expanding anchors or M10 all steel nuts and bolts, at maximum 500mm centres.

Details of the different specifications for the insulated partitions are given in Table 2.

Channel Size (mm x mm x mm)	Maximum Partition Height - m	
	Single skin uninsulated partitions	Double skin insulated partitions
80 x 60 x 3	9.0	5.5
100 x 60 x 3	10.5	6.5
125 x 60 x 3	12.5	8.0
150 x 60 x 3	14.5	9.5
175 x 60 x 3	15.0	10.5
200 x 60 x 3	15.0	12.0
Two 150 x 60 x 3 back to back	15.0	11.5
Two 175 x 60 x 3 back to back	15.0	13.0
Two 200 x 60 x 3 back to back	15.0	15.0

Table 1. Sizes of steel channel in partition framework



Insulated Partitions

The stone wool must be fitted into the channels. If the stone wool does not fill the cavity it must be fastened in position with 2.5mm diameter steel stud welded pins and 38mm diameter spring steel washers. The pins are positioned in a grid 400mm x 400mm maximum. Joints in the layers of stone wool must overlap by at least 150mm.

Fire Resistance - Minutes		Minimum Stud Size - mm	Impact Board Fillets	Stone Wool Infill kg/m ³
Integrity	Insulation			
240	-	80	None	None
240	60	80	None	2 x 40 x 100
240	90	100	None	2 x 50 x 100
240	120	80	1 per face	2 x 50 x 140
240	180	80	2 per face	3 x 40 x 140
240	240	150	2 per face	3 x 50 x 140

Table 2.

Partitions Insulated with Plasterboard

An alternative construction of the insulated partitions is to fit British Gypsum Fireline board within the partition instead of stone wool. Light gauge steel studs, the same depth as the 3mm studs are fitted midway between the 3mm studs. The Fireline board is fastened to both sets of studs with steel drywall screws at 300mm nominal centres. The Impact Board is fastened through the plasterboard with M5.5 Ejoyt steel self drill and tap screws at 300mm maximum centres. No Impact Board cover fillets are required. Details of the layers of Fireline plasterboard required for 30, 60 and 120 minutes fire ratings are shown in Table 3. The Impact Board cover panels in the deflection head assembly are fitted with the layers of plasterboard. All other construction details are the same as for the partitions insulated with stone wool.

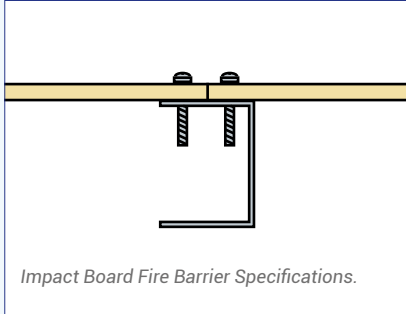
Fire Resistance - Minutes		Minimum Stud Size	Impact Board	Fireline Plasterboard
Integrity	Insulation	mm	Fillets	Per Face
240	30	80	None	None
240	60	80	None	1 x 15mm
240	120	80	None	2 x 12.5mm

Table 3. Partitions insulated with plasterboard

The size of steel channel used in the construction of the partition framework for various heights is given in Table 1.

Fire Barrier Systems

Fire resistance 240 minutes integrity only.
Fire attack from either side.



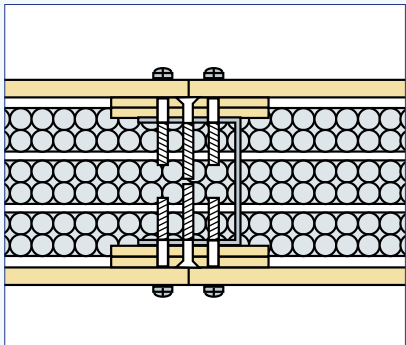
Perimeter channels fastened to surrounding construction with M10 or M12 all-steel expanding anchors (or equivalent for alternative types of supporting construction) at 500mm maximum centres.

The vertical channels are set at a maximum 1220mm centres. Horizontal and vertical channel members either welded together or joined with steel angle cleats, minimum 60mm x 60mm x 3mm thick x 60mm long, fastened to each channel member with two M10 steel bolts and nuts.

A single layer of 9.5mm Impact Board fixed on one side of channel with M5.5 steel self drill and tap Tek screws at 250mm nominal centres. Fixings a minimum of 12mm from edge of sheet and a maximum of 50mm from corners. Length of fixing to be sufficient to ensure appropriate penetration of screw thread in accordance with screw manufacturer's recommendations.

Vertical board joints coincide with studs, horizontal board joints are backed by steel channel the same size as the vertical studs.

Fire resistance 240 minutes integrity and insulation.
Fire attack from either side.



Perimeter channels fastened to surrounding construction with M10 or M12 all-steel expanding anchors (or equivalent for alternative types of supporting construction) at 500mm maximum centres.

The vertical channels are set at a maximum 1200mm centres. Horizontal and vertical channel members with steel angle cleats, minimum 60mm x 60mm x 3mm thick x 60mm long, fastened to each channel member with two M10 steel bolts and nuts. 9.5mm Kemwell Impact Board fillets fixed on both sides of channel. Fillet strips to overlap channel by minimum of 20mm on both sides.

9.5mm Kemwell Impact Board sheets fixed through the fillet on both sides of channel, using M5.5 steel self drill and tap Tek screws at 250mm nominal centres.

Fixings a minimum of 12mm from edge of sheet and a maximum of 50mm from corners. The length of fixing to be sufficient to ensure appropriate penetration of screw thread, in accordance with manufacturer's recommendations.

Vertical board joints coincide with studs, horizontal board joints are backed by steel channel the same size as the vertical studs.

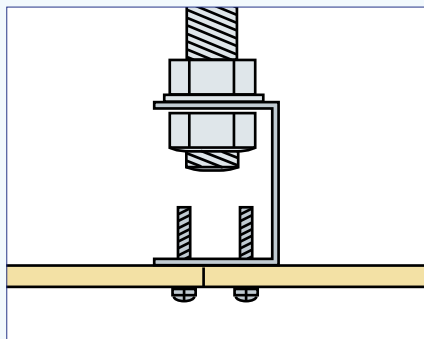
Rockwool is fitted into the channels, 3 x 40mm x 140kg/m³. The layers are staggered by a minimum of 150mm and should fill the cavity.

Please contact our Technical department for further information.



Suspended Ceiling Membranes

**Suspended ceiling membrane, fire resistance 240 minutes integrity only.
Fire attack from above and below.**



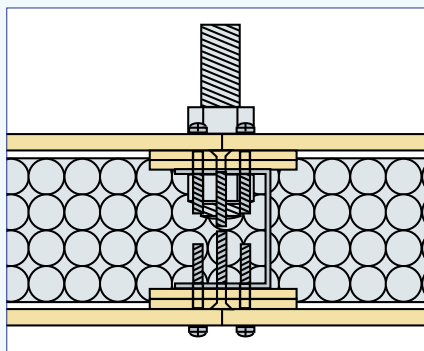
Perimeter channels of ceiling membrane fastened to surrounding construction with M10 or M12 all-steel expanding anchors (or equivalent for alternative types of supporting construction) at 500mm maximum centres.

Primary channels at 1200mm maximum centres, supported from building structure above the ceiling membrane with steel drop rods at 1.5m centres. Threaded rods pass through clearance holes in the upper flange of the channels and are fastened with steel hexagon full nuts.

Diameter of drop rods such that the tensile stress within the rods does not exceed 6N/mm² for fire ratings up to 240 minutes.

(This may be increased to 10Nmm² if only a 120 minutes fire rating is required).

9.5mm Kemwell Impact Boards fastened to lower flange of steel channels with M5.5 steel self-drill and tap Tek screws at 200mm nominal centres. Fixings a minimum of 12mm from edge of sheet and a maximum of 50mm from corners. Length of fixing to be sufficient to ensure appropriate penetration of screw thread in accordance with screw manufacturer's recommendations.



Fire resistance 240 minutes integrity and insulation.

Fire attack from above and below.

Perimeter channels of ceiling membrane fastened to surrounding construction with M10 or M12 all steel expanding anchors (or equivalent for alternative types of supporting construction) at 500mm maximum centres.

Primary channels at 1200 maximum centres, supported from building structure above the ceiling membrane with steel drop rods at 1.5m centres. Threaded pass through clearance holes in the upper flange of the channels and are fastened with steel hexagon full nuts.

Diameter of drop rods such that the tensile stress within the rods does not exceed 6N/mm² for fire ratings up to 240 minutes.

2 x 9.5mm Impact Board fillet strips fitted over the upper and lower faces of the channel members. Fillets must overlap the channels by at least 20mm on both sides.

9.5mm Kemwell Impact Boards fastened (through the fillet strips) to upper and lower flanges of steel channels with M5.5 steel self drill and tap Tek screws at 200mm nominal centres. Fixings a minimum of 12mm from edge of sheet and a maximum of 50mm from corners. Length of fixing to be sufficient to ensure appropriate penetration of screw thread in accordance with screw manufacturer's recommendations.

Longitudinal board joints coincide with primary channels, transverse board joints backed by steel channel the same size as the primary channels.

Rockwool insulation 120mm x 140kg/m³ fitted between the channels, and joints to overlap by at least 150mm.



Fire Stopping Systems

Services

Services can be encased using Kemwell Impact Board to provide compartmentation and fire resistance enclosures. Inspection panels can be incorporated in to the enclosure to allow for maintenance access.

Barriers constructed in Kemwell Impact Board are used to seal large openings. The services are then fire-stopped using any one of the **KemStop** range of fire-stopping systems available through Kemwell;

- **KemStop** Cementitious mortar
- **KemStop** RTV foam
- **KemStop** Ablative coated mineral fibre slabs
- **KemStop** Fire collars
- **KemStop** Fire resistance cement
- **KemStop** Batts

For all details relating to the KemStop range of fire stopping products, please contact the Kemwell Fire Technical Team.

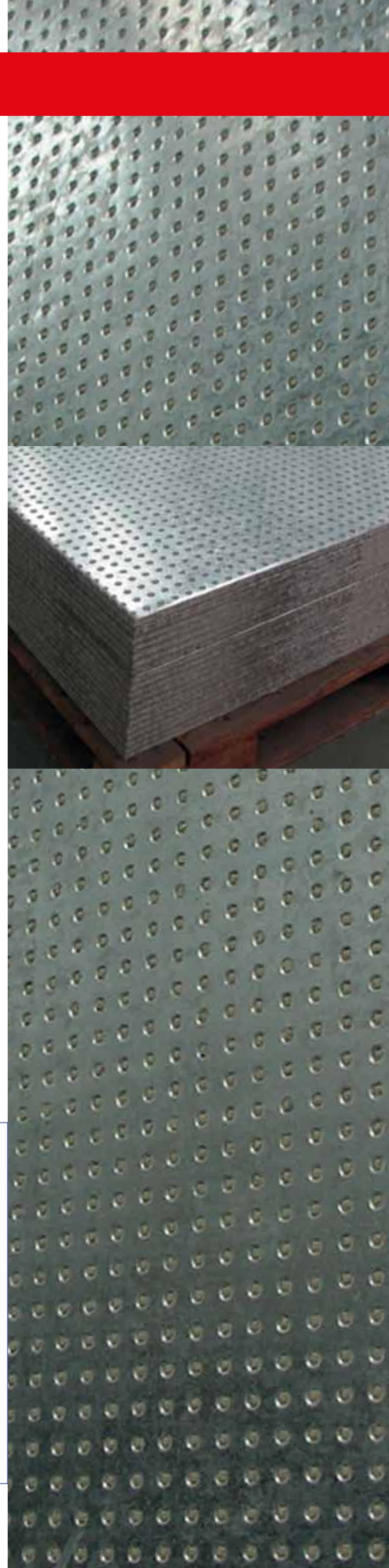
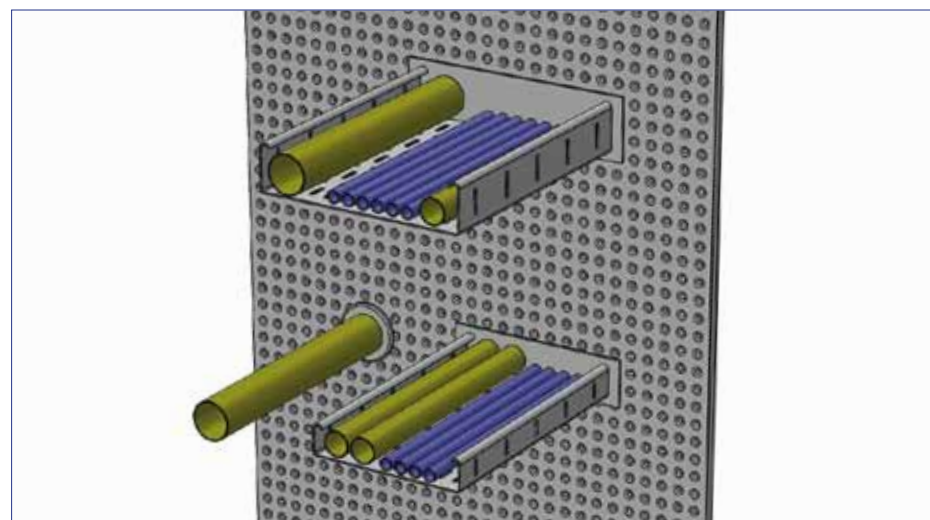
KemStop Coated Mineral Wool

Up to 4 hours fire resistance for services through fire barriers where integrity needs to be maintained.

Batts that are coated are effective for sealing around cables and cable tray penetrations and can be used in blockwork, steel and dry wall partitions.

KemStop Fire Resistant Cement

Up to 4 hours fire resistance for services through fire barriers where integrity needs to be maintained.

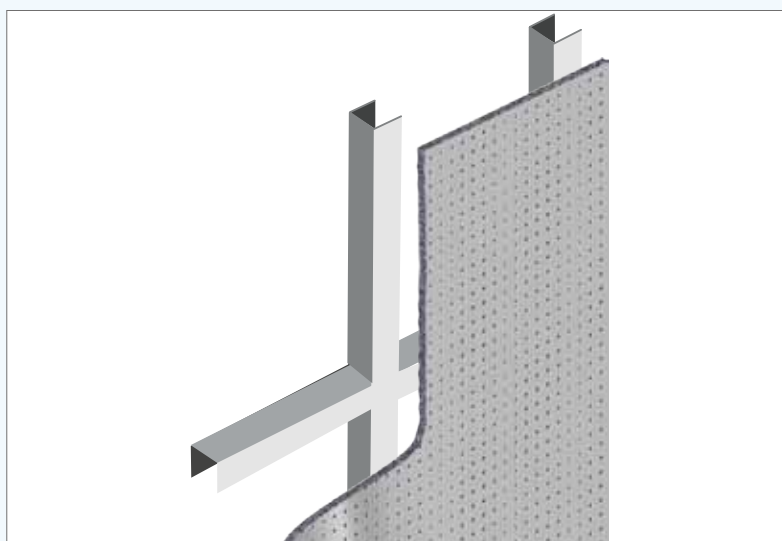




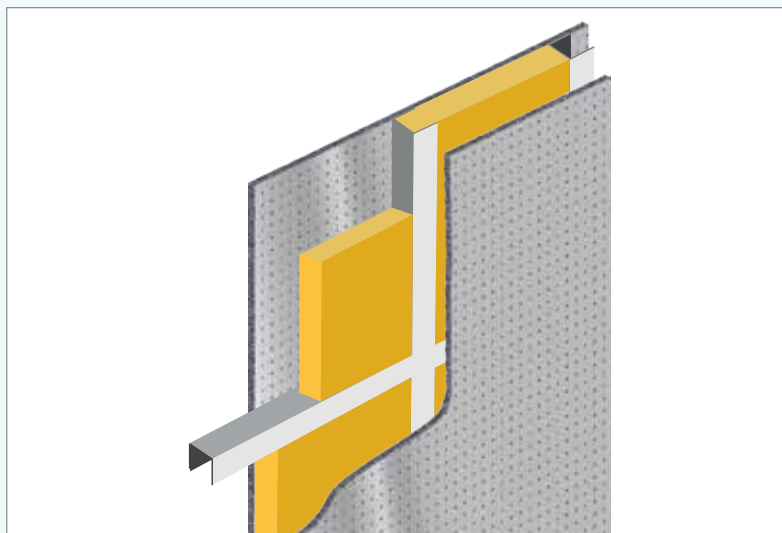
Kemwell Impact Board Integrity and Insulated Wall Components

- 9.5mm Impact Board industrial 2440mm x 1220mm
- Galvanised steel channel Head and base track, 80mm x 60mm x 3mm thick, connected to substrate using suitable non-combustible fixings at 500mm maximum centres
- Vertical galvanised steel channels, 80mm x 60mm x 3mm thick located at maximum 1220mm centres
- Horizontal intermediate framing sections required at maximum 2440mm centres
- Vertical and horizontal steel channel sections connected using steel angle cleats minimum 60mm x 120mm x 3mm thick
- Framing centres or section size may vary depending on the height and partition performance requirements
- Mineral wool thickness and density in accordance with the required fire resistance performance
- Cover fillets may be required at board joints (depending on fire performance)
- Impact Board fastened to steel framework using 5.5mm diameter self-tapping, self-drilling fixings (Ejot HS38 or HS55) minimum 38mm long at 250mm nominal centres.

Impact Board Fire Integrity Wall



Impact Board Insulated Fire Wall



Research & Fire Testing

The fire safety of a building or facility is of vital importance to Kemwell Fire International Ltd.

Kemwell Impact Board goes under extensive fire testing. This effectively measures the fire performance of a construction in a variety of applications, so we know that it will perform when it needs to, allowing people to reach safety

during a fire, and to protect the building and its contents, as well as surrounding buildings) as much as possible.

Our accumulated research and test information enables our expert design engineers to develop practical and effective solutions for the customers' specific application and project.



Loaded Floor



Self-supporting Ceiling



Access Panel



Suspended Ceiling



Hydrocarbon Fire Barrier



Fire Wall



Smoke Outlet Duct



Kitchen Extract Duct



Ventilation Duct

Fire and Blast Resistant Barriers to High Voltage Transformers



SCS Plant Crist, Florida US.

TECHNICAL PROPERTIES

Test	Standard	Result
Size		1200 x 2400mm
Weight & Thickness		21kg/m ² 9.5mm 17kg/m ² 6.0mm
Composition	BS EN 10346	Facing - Z275 galvanised steel sheet, 0.5mm thick Core - Compressed high density fibre cement
Surface Alkalinity	pH 9-10	
Flexural Strength	BS EN 12467	103 N/mm ²
Bending Modulus	BS EN 12467	21883 N/mm ²
Impact Strength	BS EN 1128	> 85 mm/mm, unaffected
Loadbearing Capacity		15 kN/m ² with fire attack
Moisture Content	By weight	7- 8%

BOARD SPECIFICATION

Test	Standard	Result
Fire Rated Systems	BS 476: Part 20-24	Tested, up to 360 minutes
	BS EN 1363-1 & 2	Tested, up to 360 minutes
	Hydrocarbon fire	H120 minutes
Non-combustible	BS EN ISO 1182	Pass
Heat of Combustion	BS EN ISO 1716	Pass
Reaction to Fire - Classification	EN 13501-1	Euro Class A1/A1FL
Resistant to Continuous Heating	In House	350°C
Blast Resistance		Air blast pressure 300 kN/m ² , unaffected
Test	Standard	Result
Acoustic Reduction (over range 100-3150 Hz)	AS 1276.1 & 1191 ASTM E90 & E413 EN ISO 10140-3 & 717-1	Thickness
		9.5mm
		6.0mm
Test	Standard	Result
Green Labeled Building Board	Hong Kong Singapore	Fibre cement core certified, no heavy metal & no harmful substance
Organic Emission	ASTM D5116-06	Non-toxic & No formaldehyde, satisfied the emission tests
Recyclable Product	ISO 14001	Crushed down for recycle use, Products made under ISO 14001 environmental management system

Note: All physical performance values of products depicted in this technical handbook are averages based on the standard production. The figures may be changed dependent on the test method used.

Boards manufactured in accordance with: ISO 9001:2008 Standard Quality Management Systems ISO 14001:2004 Environmental Management Systems



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