FIREMAC

passive fire protection

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FIREMAC FM BLUE

Fire resistant walls, ceilings, ductwork and services enclosures.

THE QUEEN'S AWARDS FOR ENTERPRISE 2018

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FIREMAC

COMPANY PROFILE

Firemac was established in 1989 and has grown to become a major provider of passive fire protection products, both in the UK and internationally.

Passive fire protection (PFP) is a key part of the structural integrity and fire safety in a building. Passive fire protection contains or slows the spread of a fire through the use of fire-resistant ductwork, walls, floors, and doors.

Firemac has been at the forefront of product design for the PFP sector for over 25 years, and has extensive experience advising a broad range of clients on solution selection through to designing and installing ductwork protection systems, fire walls and ceilings, and fire resistant services enclosures.

Firemac's market leading product range for ductwork - Firemac FM60, Firemac FM120 and Firemac FM240 - has a proven track record in builds both in the UK, and increasingly, in international markets. More recently, Firemac has introduced FM Blue - an impact-resisting, steel-faced non-combustible board that can be used to form fire resisting walls, ceilings, ducts and enclosures.

As our customers would expect of a company working in safety critical systems, Firemac is ISO 9001 registered and all FM Blue systems are covered by IFC Certification third party certification schemes. Several Firemac FM Blue walls are listed on the UL third party certification website.

Firemac FM Blue was used in a fire resistant passenger tunnel in London Underground's re-development of Cannon Street Station.

The purpose of the tunnel was to achieve the safe transit of passengers from the street entrance into the main stairs, through the middle of a construction site.

The passageway was required to be structurally sound, suitable for passenger loadings at peak times, relatively lightweight so as to not exceed the structural loading capacity of the existing station flooring, aesthetically pleasing and incorporate services fixings.

Firemac FM Blue has been incorporated in a number of major civil engineering projects including Cottam power station, part of EDF Energy's power generating capacity in the UK.

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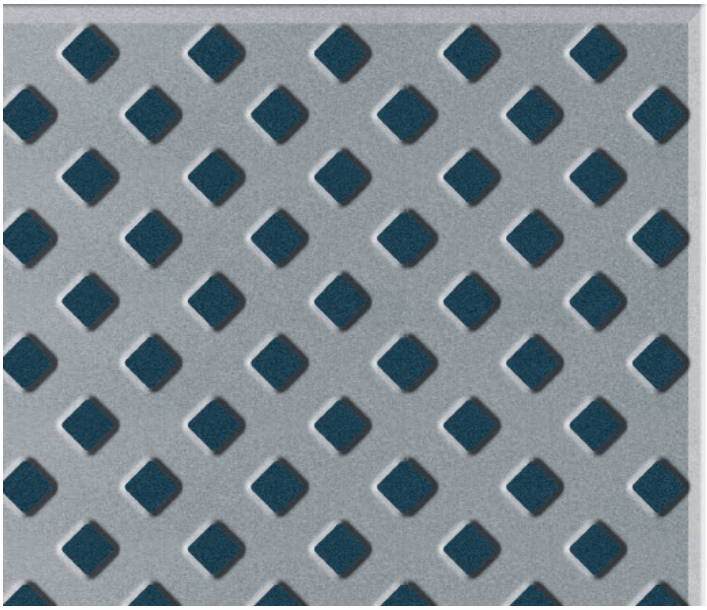
FIREMAC FM BLUE

Building Regulations require that new buildings must be divided into fire compartments and protected means of escape in order that the spread of fire in the building is contained. There are obvious areas of weakness which include doors, ceilings, walls, building services and ventilation ductwork passing from one compartment to another.

Firemac FM Blue can be used to ensure that all of these systems have up to 4 hours fire resistance. Firemac FM Blue is a non-combustible composite board with a fibre reinforced cement core and outer facings of 0.6mm perforated galvanised steel mechanically bonded to the core. Other steel finishes such as stainless steel are also available on request, depending on quantity.

Firemac FM Blue systems provide robust insulated or uninsulated vertical and horizontal barriers, ventilation, smoke extract and kitchen extract ductwork and enclosures for building services with a fire resistance of up to 4 hours. FM Blue systems are particularly useful where high levels of impact or blast resistance are required.



Exceptionally robust, FM Blue boards have a fibre reinforced core and steel facings to give fire resistance of up to 4 hours.

A number of Firemac FM Blue temporary hoardings, lobby enclosures, security walls and ceilings have been installed by Kilnbridge Construction Services Ltd. at the recently developed Tottenham Court Road Station in London. All exposed surfaces were coated with a Sherwin-Williams coating system in the blue London Underground colour. FM Blue has also been used in other London Underground projects including Cannon Street, and mainline stations such as London Victoria.

APPLICATIONS

Typical applications include:

- Vertical and horizontal barriers forming escape routes and refuge areas
- Enclosures and barriers around hazardous areas
- Fire resisting ductwork and smoke extract ductwork
- Equipment protection
- Document protection
- Hoardings and walkways
- Warehouse compartmentation
- Service shafts
- Electrical transformer and switch gear rooms
- FM Blue systems are particularly useful where high levels of impact or blast resistance are required

FM Blue is extensively used for protected walkways in metros and airports, has been tested to BS 5234: Part 2, and satisfies the performance requirements for Severe Duty and the maximum crowd pressure rating (3kN/m)

Sea Containers House, overlooking the river Thames in London, and with 359 hotel suites and 290,000 square feet of office space creating employment for around 2,800 people, has to pay particular attention to the risks associated with fire. Fires beginning in loading bays and other basement areas can be especially devastating.

As basement areas are almost always enclosed spaces with no windows or other means of natural ventilation, there is no external route for heat dispersal in the event of a fire, resulting in significant heat build-up. The movement of smoke is similarly restricted, with the usual means of escape being the stairways. This could prove disastrous, as the stairways are also the most obvious means of escape for anyone finding themselves in a burning building.

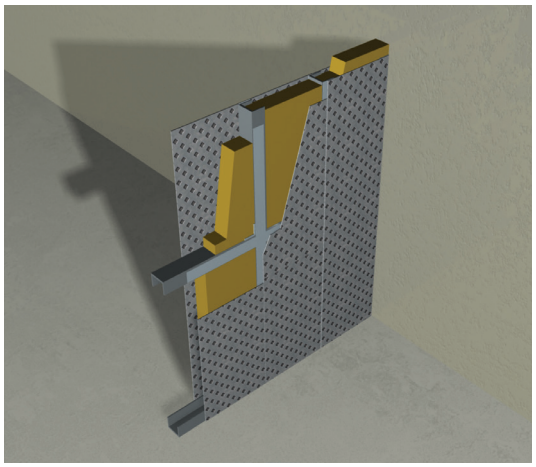
Kilnbridge Construction Services Passive Fire Protection Division was brought in to provide additional protection for the smoke clearance system installed by Balfour Beatty Engineering Services. FM Blue was installed over an extremely demanding three-week program. Four-sided box structures were created, encasing the extractor unit and ducting, where necessary, and three-sided structures were created where the ducting extraction equipment was flush against the concrete ceiling.

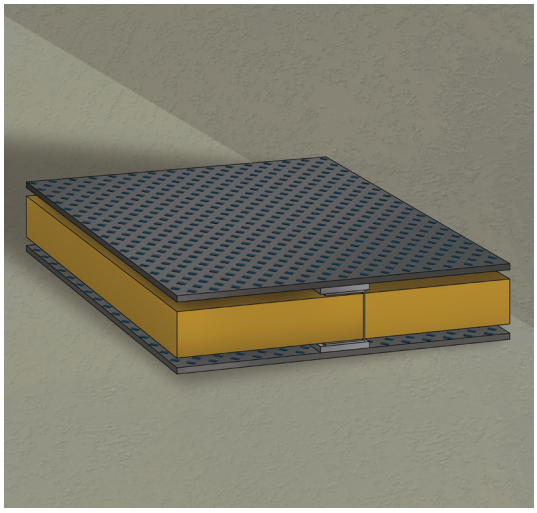
SUMMARY OF FIRE PERFORMANCE

DUCTWORK

When tested to BS 476: Part 24: 1987 this system satisfies the stability and integrity performance criteria for up to 240 minutes. If rock mineral wool is added then the insulation performance criterion is also satisfied for up to 120 minutes.

If the duct is required to satisfy the performance requirements for a smoke extract duct as given in BS 476: Part 24: 1987 then the Firemac FM Blue duct system has a fire resistance of 60 minutes. If the smoke temperature is up to 300°C or 400°C, then longer fire resistance periods are provided. Air leakage complies with the requirements of High Pressure Class C ductwork listed within the B&ES (formally HVCA) document DW/144.





CEILINGS

Firemac FM Blue steel-framed, self-supporting ceiling systems have fire resistance periods up to 240 minutes in terms of BS EN 1364-2 and BS 476: Part 22: 1987 for fire attack from below, for spans of up to 4.4m and unlimited width.

For greater spans a similar fire performance can be achieved when tested to BS 476: Part 22: 1987.

The ceilings will also resist fire from above when tested to the heating conditions and performance criteria of BS 476: Part 22: 1987.

FIRE BARRIERS AT SERVICE PENETRATIONS

Firemac FM Blue vertical and horizontal fire barriers can be used to reduce the size of openings around services where they pass through openings in walls and floors. The horizontal barriers are designed to take foot traffic.

SERVICES ENCLOSURES

Firemac FM Blue enclosures to building services are constructed in a similar manner to Firemac FM Blue ventilation ductwork.

When exposed to the heating conditions and performance criteria of BS 476: Part 20: 1987 the enclosures have a fire resistance of up to 240 minutes (integrity and insulation).

BLAST RESISTANCE

A test wall comprising of 8.5mm Firemac FM Blue secured to one face of a framework of galvanised steel channels had a nominal delivered dynamic pressure loading of 14kPa applied to the frame side of the wall with no measurable permanent displacement of the Firemac FM Blue boards.

STRENGTH AND ROBUSTNESS

The Firemac FM Blue single skin wall, 5m high, was tested to BS 5234: Part 2 and satisfied the performance requirements for Severe Duty and the maximum crowd pressure rating (3kN/m).

The wall was subjected to tests for stiffness, damage by small hard body impact and large soft body impact, structural damage by large soft body impacts, door slamming and resistance to crowd pressure.

THIRD PARTY CERTIFICATION

Firemac FM Blue three hour and four hour fire resisting walls have been successfully tested to UL263 which includes a hose stream test, and the board production is covered by a UL third party certification scheme.

These walls and the single skin uninsulated Firemac FM Blue wall have also been successfully tested to BS EN 1364-1 and BS 476: Part 24. All of these systems are listed on the UL website.

All Firemac FM Blue wall, ceiling, duct and service enclosure systems and the board production are covered by IFC third party certification schemes.

HOSE STREAM

The hose stream test serves as an indicator for two important attributes:

1) the integrity of a fire stop or assembly during fire exposure

2) the overall reliability of the material to perform its intended function.

Firemac FM Blue three hour and four hour walls have successfully completed the requirements of the hose stream test to UL263.

TEST EVIDENCE AND ASSESSMENTS

FIRE ASSESSMENTS

Report no.	Description	Maximum fire resistance to BS476 (min)		
		Stability (ducts only)	Integrity	Insulation
Exova Warringtonfire 192474J	9 Wall systems	n/a	240	240
Exova Warringtonfire 325685	6 Ceiling systems	n/a	240	240
Exova Warringtonfire 324514	3 Duct systems	240	240	240
Exova Warringtonfire 323294	10 Service enclosures	n/a	240	240
Exova Warringtonfire 332995 Issue 2	4 Penetration seal barriers	0	240	240

The above systems have been fire tested/assessed to BS 476: Parts 20, 22 & 24. At time of printing, some walls have also been successfully tested to BS EN 1364-1 and UL263 (including hose stream) and a ceiling has been tested to BS EN 1364-2.

COMPLETED PERFORMANCE TESTS

Report no.	Conforms to	Description
BRE 264954 Rev 1	BS EN ISO 1182: 2010	On the central fibre cement core of FM Blue
BRE 266127	BS EN ISO 1716: :2010	On the central fibre cement core of FM Blue
BRE 266768	BS EN 13501-1: 2007	A1 reaction to fire classification
BRE 279356	Dynamic pressure loading of 14kPa	Showed no measurable permanent displacement of FM Blue wall
BSRIA C25092A	BSRIA air leakage test	Complied with the requirements of High Pressure Class C ductwork
BTC 18586	BS 5234: Part 2	Severe Duty for strength and robustness of partitions, including crowd pressure rating (3kN/m)

KEY MARKETS

Firemac FM Blue is applicable in any project where there is a requirement to protect life and property. FM Blue has been installed across a wide range of sectors including:

- Major transport and infrastructure projects such as London Underground and Network Rail
- Power stations including the nuclear facility at Heysham
- Office blocks
- Communications and asset protection most recently in a network of BT communications tunnels under Birmingham

Other key markets include:

- Petrochemical facilities
- Pharmaceutical facilities
- Mixed use developments
- Military facilities
- Shopping malls

HERE EAST

Location: Queen Elizabeth Olympic Park, London, United Kingdom

Firemac FM Blue has been used to provide one-hour fire protection for ceilings in the development of Here East on the site of the London 2012 Olympic Park. It will be the biggest Technology Innovation Centre ever built in Europe.

TOWER HILL PROTECTED STAIRCASE

Location: Tower Hill Underground Station, London, United Kingdom

Firemac FM Blue was installed as a double-skin insulated wall to provide a two-hour fire protected stairway. The wall was also required to satisfy the impact and crowd pressure performance criteria of BS 5234.

FM BLUE: SUMMARY OF COMMERCIAL ADVANTAGES

- Firemac is a leading passive fire protection company
- UL and IFC Certification third party certification
- At the forefront of product design for the PFP sector for over 25 years
- Effective value engineering against other products
- Suite of test evidence and assessments
- Full technical support including technical submittals and assessments
- Installer training
- Site inspections
- Proven in major builds

INTERNATIONAL DISTRIBUTION

Firemac FM Blue is distributed in key markets in the UK, Europe, the Middle East and Asia Pacific through a network of major partners, providing both stock availability and logistic support.

In the UK Firemac FM Blue is distributed by SIG, the UK's market leading specialist distributor to the construction industry. SIG have a nationwide branch network, and a fleet of specialist delivery vehicles, ensuring product delivery on time. Firemac provides full technical support to SIG and their customers.

CASE STUDY

Firemac FM Blue boards were installed at Race Bank, a 580 megawatt (MW) UK Offshore Wind Farm project. Race Bank Offshore Wind Farm is located west of the village of Walpole St. Peter in Norfolk.

The boards, provide protective-screened enclosures around two shunt reactors and two DRC transformers. Over 1200m^2 of Firemac FM Blue fire protection board were used in the screens which measured over 10m high by 14m long. The Firemac FM Blue walls provide weather tolerant, fire, blast and acoustic resistant screens.

This Firemac FM Blue was designed and installed to provide 240min fire resistance in accordance with BS 476: Part 22: 1987.

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