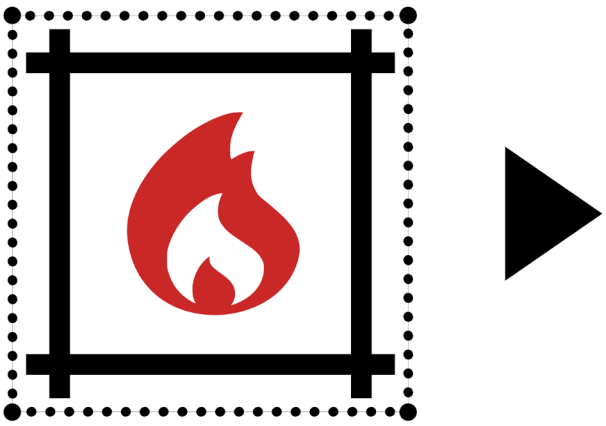
COMPREHENSIVE DOCUMENT ON THE FIRE PROTECTION OF VENTILATED FAÇADES



CAVITY FIRE BARRIERS

CAVITY FIRE BARRIERS FOR VENTILATED FAÇADE COMPARTMENTATION

FLORIM

“Guardiamo al business come una forza positiva in grado di generare profitto e allo stesso tempo creare un impatto virtuoso sulle persone e sull’ambiente. Da sempre.

Le nostre scelte, giorno dopo giorno, ci hanno portato a migliorare il nostro modo di fare impresa.”

“We conceive the business as a positive force able to generate profits and at the same time create a virtuous impact on people and the environment. Since forever.

Our choices, day after day, have led us to improve our way of doing business.”

Ci siamo misurati con **alti standard di performance sociale e ambientale** e dopo un lungo e rigoroso processo di verifica **siamo diventati B Corp.**

*We vied with **high social and environmental performance standards**, and after a long and scrupulous verification process, we became a B Corp certified company.*

Le B Corp costituiscono un movimento globale di ‘Purpose Driven Businesses’ che ha l’obiettivo di diffondere un **nuovo paradigma economico**, che vede le imprese come protagoniste nella diffusione di modelli di business per un’economia più equa e inclusiva.

*B Corps constitute a global movement of ‘Purpose Driven Businesses’ with the goal of spreading a **new economic paradigm**, where companies play a leading role in promoting business models for a fairer and more inclusive economy.*

Siamo orgogliosi di far parte di un **cambiamento culturale epocale** e rientrare tra il 3% delle imprese che sono riuscite a raggiungere la certificazione.

*We are proud to be part of an **epochal cultural change** and to belong to the 3% of companies that have successfully achieved certification.*

Il nostro risultato non è altro che la conseguenza di molteplici attività compiute negli anni passati: dal 2008 redigiamo il **Bilancio di Sostenibilità** e il 19 marzo 2020 siamo diventati **Società Benefit**, formalizzando il nostro impegno a migliorare l’impatto positivo sulla società e sull’ambiente.

*Our result is nothing more than the consequence of multiple activities carried out in past years: since 2008, we have prepared the **Sustainability Report**, and on March 19, 2020, we became a **Benefit Corporation**, formalizing our commitment to improving our positive impact on society and the environment.*

Scopri di più:
Find out more:

Sono le superfici
Carbon Neutral di Florim
che **compensano tutta la CO_2**
emessa durante il loro ciclo di vita.

*Florim’s Carbon Neutral surfaces **offset all the CO_2** emitted during their lifecycle.*

Misuriamo l’impatto ambientale delle nostre superfici, dalle materie prime allo smaltimento.

***We measure** the environmental impact of our surfaces, from raw materials to disposal.*

Riduciamo l’uso di risorse naturali e abbattiamo le nostre emissioni grazie a un processo produttivo più sostenibile: fino al 100% in termini di acqua, energia elettrica e recupero degli scarti crudi.

***We reduce** the use of natural resources and lower our emissions through a manufacturing process that is more sustainabile: up to 100% in terms of water, electricity, and raw waste recovery.*

Compensiamo tutta la CO_2 emessa durante il ciclo di vita, creando collezioni Carbon Neutral.

***We offset** all the CO_2 emitted during the lifecycle creating Carbon Neutral collections.*

Scopri di più:
Find out more:

Florim Solutions

Florim Solutions emerged from Florim Group's commitment to address contemporary architecture's demand for seamlessly integrating aesthetics with technological and functional performances. An experienced team of engineers, architects and site personnel guides customers through the entire process, from collecting the DWG file to completion of the works, using rigorous **Project Management** model. In fact, the Florim Solutions Project Division collaborates closely with designers every step of the way, from initial concept selection and structural verifications to construction and installation, offering comprehensive **turnkey solutions**. The synergy between our team, organisational culture and material expertise adds value for our customers, enhancing the unique aspects of each project.

CONTENTS

VENTILATED FAÇADES

INTRODUCTION TO FLORIM VENTILATED FAÇADE

The porcelain stoneware ventilated façade is an external cladding system for buildings that provides an ideal technical solution aimed to combine aesthetic appeal, functionality, easy maintenance and energy efficiency.

The system is made of ceramic slabs fixed to a metal substructure placed between the wall and the slabs, thus allowing the installation of an insulation system and the creation of a ventilation chamber inbetween these surfaces. This technical solution is perfectly suitable for new building constructions as well as for building development and renovation.

Depending on the fixing system, we distinguish the ventilated façade in:

- **VISIBLE FAÇADE FIXING SYSTEMS** - these systems are labelled by florim with "**V**"
- **HIDDEN FAÇADE FIXING SYSTEM** - these systems are labelled by florim with "**S**"

Some Florim VENTILATED FAÇADE references are reported in the following.

Torre Milano - Residential | Milan - Italy
S1 fixing system - Hidden fixing ventilated façade system with FLORIM Magnum slabs – maximum size 160x320 cm - 6 mm thickness

Residential complex- Residential | Novate Milanese (MI) - Italy
S5 fixing system - Hidden fixing ventilated façade system for FLORIM tiles maximum size 80x180 cm - 9 mm thickness

Torre stella - Residential | Milan - Italy
V4 fixing system - Visible fixing ventilated façade system for Florim tiles – maximum tile size 80x180 cm - 9 mm thickness

Jona Asti School – Public building | Asti (AT) - Italy
V1 fixing system - Visible fixing ventilated façade system for Florim Magnum slabs – maximum size 160x320 cm - 6 mm thickness

FIRE PERFORMANCE SPECIFICATIONS OF FLORIM VENTILATED FAÇADES

As a general rule, ensuring fire safety in ventilated façades involves using non-flammable materials and interrupting the ventilation cavity.

Ceramic, including porcelain stoneware, falls into the category of inert and non-flammable materials according to Italian Ministerial Decree 10/3/2005. As a result, it is classified in the highest 'reaction to fire' class (Euroclasses A1 and $A1_{FL}$) without requiring specific testing[10].

More specifically:

- All FLORIM ventilated façade systems use **porcelain stoneware panels equipped with fibreglass safety mesh**. These panels are certified as 'reaction to fire' class A2-s1, d0 according to UNI EN 13501-1;
- **The FLORIM S1 façade system** is ETA-certified under reference number N 18/1145 dated 15/04/2019 and holds a **Euroclass B-s2, d0** classification in compliance with standard **EN 13501-1**: 2007+A1:2009 and Commission Delegated Regulation (EU) 2016/364. The classification is valid for intended use as a 'ventilated façade external cladding system' applicable to any colour ceramic covering panel where the insulating material is class A1 or A2-s2, d0.
- **The FLORIM S1 façade system has passed the Hungarian test method of the fire propagation on building façade (MSZ 14800-6:2009).** This test focuses on determining the effect and risk evaluation of combustible façade materials by modelling a heat release of a compartment/office fire scenario in a model building with realistic construction and detail types. The aim of the test is to evaluate the horizontal and vertical fire propagation in a ventilated façade which includes an opening simulating the presence of a 120x120 cm window. The method provides actual fire spread limit (Th) in minutes. The FLORIM S1 ventilated façade system obtained a **fire spread limit equal to 45 minutes**, that corresponds to the Hungarian requirements for building with ground floor and more than 4 floors.
- **FLORIM supplies and installs cavity barriers** for fire compartmentation in ventilated façades **in collaboration with partner Tenmat**.

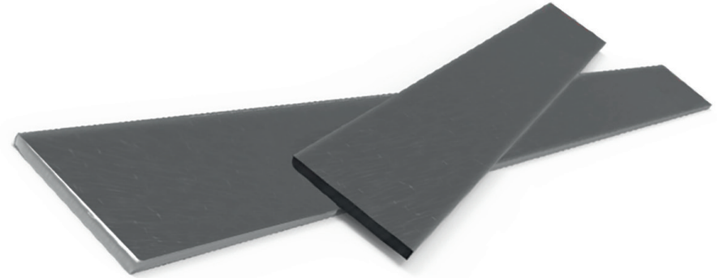
[10] Italian Ministerial Decree 10/3/2005 'Reaction to fire classes for building construction products used in works subject to safety requirements in the event of fire'. Annex C: Table of materials with Euroclass 'A1' and '$A1_{FL}$' reaction to fire rating.

COMPARTIMENTATION WITH FIRE CAVITY BARRIERS

FF 102/50

Tenmat

- **Horizontal cavity fire barrier for ventilated façades, for ventilated cavities of up to 44 mm**



Dimensions:
1000x75x60 mm

Expansion:
free 26:1

Activation temperature:
180°C

FF 102/50 is a horizontal fire barrier for ventilated cavities made from a low-smoke zero-halogen high-expansion intumescent material.
These fire barriers are designed to ensure the fire resistance performance of façade cavities that, in non-fire conditions, are ventilated or 'open state'.

FF102/50 fire barriers come in the form of rigid intumescent strips covered with a protective aluminium layer for easy handling. When exposed to fire, the intumescent material expands, effectively sealing the façade cavities. These barriers provide fire resistance for up to 120 minutes of integrity and insulation (as tested according to the BS EN 1363-1 standard, following ASFPTGD 19 guideline).

FF 102/50 fire barriers can be installed within cavities up to 50 mm wide. Once installed, they close the remaining free air gap in front of the 6 mm cavity barrier to a maximum of 44 mm.

INSTALLATION INSTRUCTIONS

1. Check for any obstructions (to be treated differently).
2. To secure the product, use stainless steel screws, ensuring they are spaced no more than 250 mm apart. Choose appropriate fixing lengths for the substrate. For masonry, a recommended minimum fixing depth of 50 mm is advised, while for timber, aim for 25 mm—unless the fixing manufacturer specifies otherwise.
3. Tighten the fastenings until the head makes gentle contact with the fire barrier (avoid over-tightening to prevent damage to the barrier).
4. Ensure that the fixing to a solid substrate aligns with the centre line of the fire barrier, and ensure that the labelled side faces outward into the cavity.
5. Place the initial fixing no more than 125 mm from one end. Attach 4 screws per linear metre, making sure that the last fixing is also within 125 mm of the cavity fire barrier's end.
6. For cut sections of cavity barrier that are 250 mm or shorter in length, only one fixing is required.
7. When installing additional lengths, make sure they are snugly positioned next to each other.

VFB PLUS

- **Horizontal cavity fire barrier for ventilated façades, for ventilated cavities of up to 450 mm.**

VFB PLUS is a horizontal cavity fire barrier designed for ventilated cavities up to 450 mm deep, made from especially formulated fire-rated rock mineral wool with an integral high-expansion intumescent seal fixed to the leading edge.

These barriers are designed to maintain a maximum gap of 44 mm for ventilation in normal use conditions. When exposed to fire, the intumescent seal rapidly expands to seal the air cavity, preventing fire from spreading vertically within the external wall.

The product has undergone extensive fire testing, adhering to the principles outlined in BS EN1363-1 and in accordance with ASFP TGD19.

VFB Plus barriers are mechanically fixed horizontally behind the external wall substrate, following the fire compartment line.
VFB Plus barriers are used for horizontal compartmentation and can be installed in conjunction with NVFB fire barriers, which provide vertical fire separation along fire compartment party wall lines.

Dimensions: 1000x75x thickness mm (where thickness is total cavity less 44 mm air gap)
Colour: red
Finish: polythene wrap
Cuttability: can be cut to length
Storage: humidity-free environment
Fungal resistance: protected by polythene
Smoke/halogen emission: Low Smoke Zero Halogen

Other characteristics:
- Typical fire resistance ratings of minimum 30 to 60 minutes (integrity and insulation)
- Higher fire ratings available dependent on application
- Up to 450 mm cavities tested
- Standard thickness of 75 mm
- Durability- and age-tested
- Durability: 40–60 years, depending on weather exposure conditions
- Dimensional tolerances: thickness +10/-0 mm; width +5/-0 mm; length +5/-0 mm.

CONSIDERATIONS FOR DESIGNING AND INSTALLING THE CAVITY FIRE BARRIER

1. The maximum air gap for this fire barrier is 44 mm.
2. The fire barriers should be installed in a continuous run (with the exception of vertical cavity barriers, which expand to a full fill). Where this is not possible, details should be agreed with the project's head designer and/or fire engineer.
3. The horizontal cavity fire barriers should be installed adjacent and tightly abutted to any vertical cavity barriers; the vertical cavity barriers should be installed first.
4. The cavity fire barriers can be cut to size as required and adjacent lengths must be fit tightly together.
5. The intumescing face of the cavity fire barrier should be free to expand if a fire breaks out, fully filling the cavity.
6. The intumescing face of the barrier has an identification label; ensure it is oriented towards the open cavity. Also make sure the label is visible, legible and correctly oriented. The label is important for future reference, for example, to identify the product during fire risk assessments or fire safety inspections.
7. Cavity fire barrier fixing brackets, both multi purpose (MP bracket) or high performance (HP bracket), must not penetrate through the covering of the cavity fire barrier.
8. Barrier fixing brackets must not penetrate the outer face of the fire barrier. The brackets must be installed with the spike inserted horizontally and centrally to the rock mineral wool section, with the bracket fixed above, and not below, the barrier itself.
9. The use of tape is not required over the joints between the lengths of cavity fire barrier. If used, it should not be applied over the surface of intumescent material.
10. The cavity fire barrier must not be penetrated by other mechanical or electrical services.

CAVITY DIMENSIONS (mm)	BARRIER WIDTH (mm)	ANCHORS	NO. OF ANCHORS PER METRE	MAXIMUM CENTRES (mm)
60-120	16-76	screws	4	250
121-134	77-90	MP brackets	2	500
135-259	91-215	MP brackets	2	500
260-300	216-256	MP brackets	3	350
301-450	257-406	MP brackets	2	500

NVFB

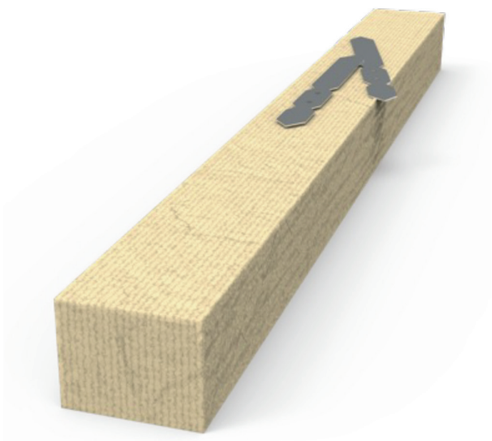
- **Not ventilated vertical fire barrier.**

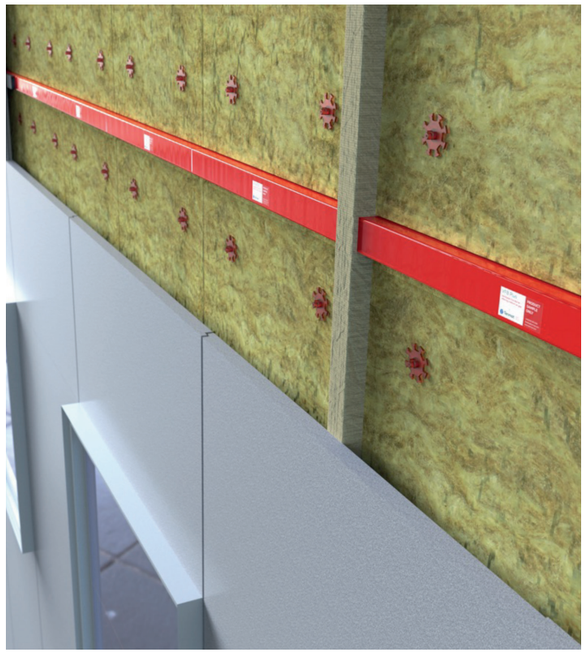
NVFB fire barriers are composed of rock mineral wool with an A1 'reaction to fire' rating and are designed to ensure fire resistance performance in external wall cavities.

The fire resistance capabilities of NVFB fire barriers for integrity (E) and insulation (I) can last up to up to 120 minutes (EI120), depending on the orientation of the NVFB barrier and the construction of the external walls.

NVFB barriers are cut to size or supplied in full slabs.
The standard supply includes the barrier made of plain rock mineral wool, with the option for foil encapsulation.

The NVFB barrier is designed for cavities up to 600 mm wide.





Dimensions:
• cut-to-size:
- 100 mm deep x width to suit cavity (+ required compression) x 1000 mm

• full slabs:
- 100 x 605 mm x 1003 mm
- 100 mm x 1000 mm x 1200 mm
Non-standard thickness options available on request from 82 mm.

Other characteristics:
- Fire resistance classification to EN 13501-2
- Reaction to fire Class A1
- Resistance to fire up to 120 minutes (EI120)
- Suitable for cavities up to 600 mm
- Suitable for use vertically or horizontally
- Supplied in 1-metre lengths
- Standard thickness/depth of 100 mm
- Available in a reduced thickness/depth of 82 mm
- Supplied plain as standard. Optional foil encapsulation available
- No maintenance required after installation

CONSIDERATIONS FOR DESIGNING AND INSTALLING THE FIRE BARRIER

1. The fire barriers should be installed in a continuous run (with the exception of vertical cavity barriers, which expand to a full fill). Where this is not possible, details should be agreed with the project's head designer and/or fire engineer.
2. The horizontal fire barriers should be installed adjacent and tightly abutted to any vertical cavity barriers; the NVFB vertical cavity barriers should be installed first.
3. The fire barriers can be cut to size as required and adjacent lengths must be fit tightly together.
4. Barrier fixing brackets must not penetrate the outer face of the fire barrier.
   The brackets must be installed with the spike inserted centrally to the rock mineral wool section.
5. The fire barrier must be installed on a flat surface, with no gaps behind the barrier.

CAVITY DIMENSIONS (mm)	BARRIER WIDTH (mm)	BARRIER ORIENTATION	ANCHORS	NO. OF ANCHORS PER METRE	MAXIMUM CENTRES (mm)
10-75	10-80	Vertical or horizontal	screws	N/A	250
121-134	76-605	Vertical or horizontal	MP brackets	2	N/A
200-450	205-455	Vertical or horizontal	MP brackets	2	N/A

Application example for **VBF PLUS** cavity barrier (red horizontal compartmentation barriers) and **NVFB** cavity barrier (unfinished vertical compartmentation barriers).

The graphics, patterns and colours presented in this catalogue are for general illustrative purposes and are not exhaustive.

FLORIM

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