POLYGLASS®

MAPEI® GROUP

XFIRE

EXTERNAL FIRE-RESISTANT BITUMINOUS MEMBRANES

PRODUCT CATALOGUE


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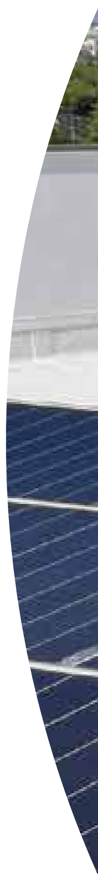
XFIRE

Introduction



Roofing systems are evolving to meet the technical needs of buildings, in line with new energy management systems and new envelope concepts.

The increase in the number of photovoltaic systems installed and the exceptional weather events of recent times require greater guarantees in terms of performance and durability of building waterproofing systems.

In particular, the installation of roof-mounted photovoltaic systems requires in-depth consideration of the choice of installation method and the integration of the structure with the waterproof system.

It is also necessary to assess the fire behaviour of the structure and the response of the roof to a possible external fire, which could be caused, for example, by a short circuit of the photovoltaic system.

Therefore, it becomes increasingly important to consider **the entire stratigraphy of the system**, starting with the integrated design of the elements and details, the choice of materials and the definition of the laying methodology. At the same time, it is essential to plan proper maintenance of the entire stratigraphy over time to ensure the best possible durability of the entire roof.

PRODUCT
CATALOGUE

Roof fire behavior of roofing
Fire reaction class of building materials

The UNI EN 13501-1 standard, which concerns the classification of reaction to fire of construction products and elements, in particular in its Part 1, offers a classification of the materials used based on the results of reaction to fire tests. It classifies construction products into seven performance classes (from A to F, in descending order of performance with respect to fire behaviour), based on the behaviour of the sample exposed to fire inside a combustion chamber (test according to EN ISO 11925-2).
According to this regulation, bituminous membranes and synthetic blankets are classified as class E.
As a result, the standard does not compare the different systems available and does not allow an assessment of the actual behaviour of the entire roofing system, but only of a single element.

Combustion chamber for fire test

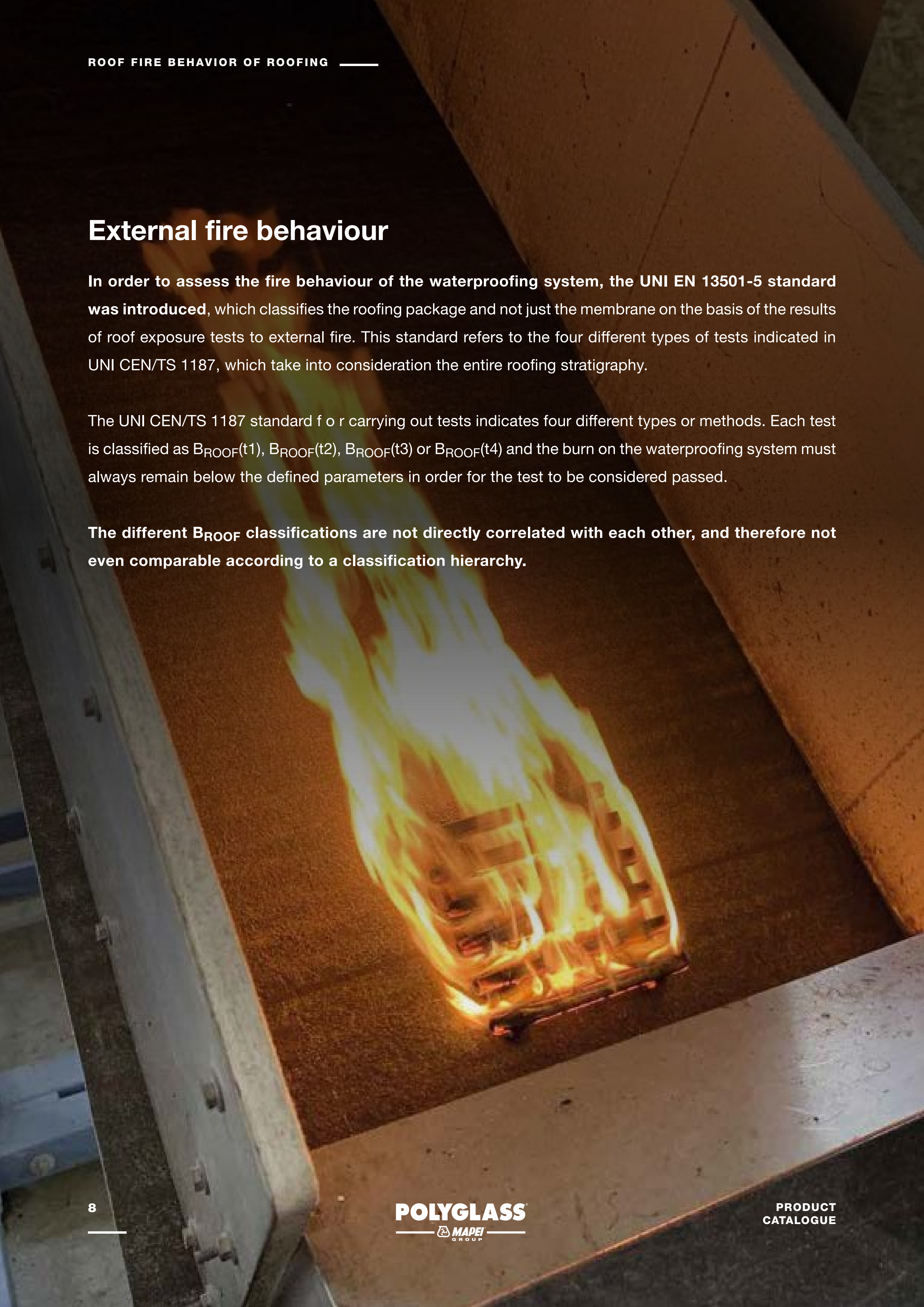
Detail of test in progress

External fire behaviour

In order to assess the fire behaviour of the waterproofing system, the UNI EN 13501-5 standard was introduced, which classifies the roofing package and not just the membrane on the basis of the results of roof exposure tests to external fire. This standard refers to the four different types of tests indicated in UNI CEN/TS 1187, which take into consideration the entire roofing stratigraphy.

The UNI CEN/TS 1187 standard f o r carrying out tests indicates four different types or methods. Each test is classified as B_{ROOF}(t1), B_{ROOF}(t2), B_{ROOF}(t3) or B_{ROOF}(t4) and the burn on the waterproofing system must always remain below the defined parameters in order for the test to be considered passed.

The different B_{ROOF} classifications are not directly correlated with each other, and therefore not even comparable according to a classification hierarchy.

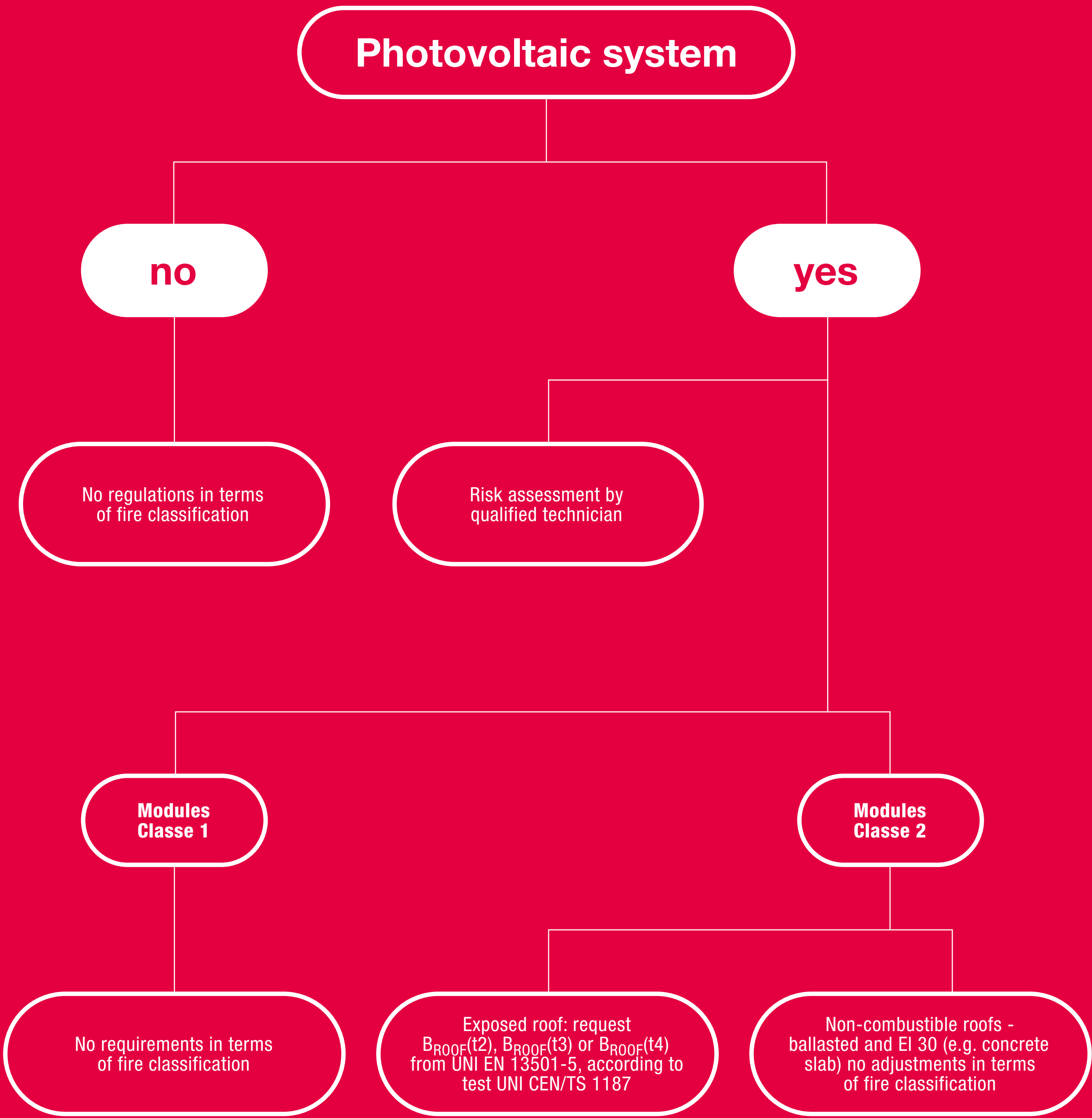


CLASS	METHOD	ROOF SLOPE	TEST
B_{ROOF}(t1)	Burning embers	15° o 45°	
B_{ROOF}(t2)	Vented burning embers	30°	
B_{ROOF}(t3)	Vented burning embers and infrared radiation	5° o 30°	
B_{ROOF}(t4)	Burning embers, ventilation, infrared radiation and fire ignition	0° o 45°	

Requirements for coverings
VV.F. Circular 7 February 2012

In Italy, the Fire Department of the Ministry of the Interior has issued the "Guide for the installation of photovoltaic systems" and the related "clarifications to the guide" concerning the B_{ROOF} classification as a reference for all roofs with photovoltaic systems.
This guide states that a qualified technician responsible for fire prevention must draw up an assessment of the risk of fire propagation caused by the presence of the photovoltaic system.
According to the fire brigade's guide, in the case of the installation of **class 1 photovoltaic panels** (highest safety level of the element), no special requirements for the roof are required.

However, for **photovoltaic panels of class 2** and higher, which have a lower safety level, a distinction must be made: if the panels are installed on a non-combustible or fire-resistant EI 30 element (such as a brick slab or screed), the roof does not require any further precautions.
Otherwise, the roof must be classified as B_{ROOF}(t2), B_{ROOF} (t3) or B_{ROOF} (t4). In the case of the presence of a photovoltaic system, the choice of the roofing system is still the responsibility of the fire brigade, so **it is always necessary to design the roofing system in cooperation with the technician responsible for fire prevention and the fire brigade**.



However, the choice of the specific system is up to the fire brigade

New vertical technical regulation RTV V.13
Implications for roofing waterproof

In Italy, following numerous negative events, **fire prevention in civil buildings** has taken an important step forward, focusing in particular on the envelope that constitutes them. This was possible thanks to the publication in the Official Gazette of the Decree of the Ministry of the Interior dated 30/03/2022, which contains the **Vertical Technical Regulation (RTV) "Enclosures of civil buildings" no. 13 as a supplement to the Fire Prevention Code Ministerial Decree of 3 August 2015 and subsequent amendments**.

Scope of application

RTV V.13 is applicable to the enclosures of all civil buildings, whether public or private, intended for commercial, social, productive or residential use, and aims to achieve the following fire safety objectives:

- **Reduce the likelihood of the spread of a fire originating inside the building, through its enclosures.**
- **Limiting the probability of propagation of a fire originating outside the building, through its enclosures.**
- **Preventing or limiting the fall of parts of the building enclosures in the event of a fire, which could hinder the evacuation of occupants or rescue operations.**

Definitions

BUILDING CLOSURE

External boundary of the building, both horizontal and vertical. This definition also includes external basement boundaries, boundaries between different parts of the building (such as crawl spaces, light wells, etc.) or boundaries between different buildings facing airspace.

COVER

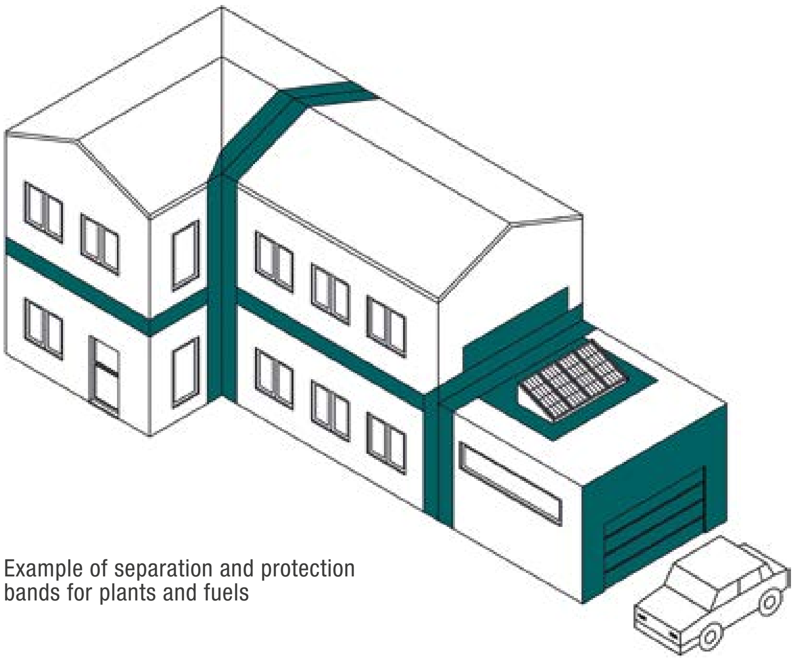
Set of components constituting the upper part of the building envelope, inclined at an angle ≤ 45° to the reference plane.

FACADE

The set of components constituting a part of the building's enclosure excluding the roof. The façade also includes portico interiors and projections.

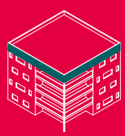
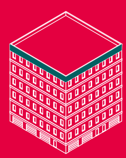
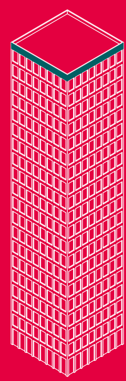
SEPARATION STRIP

Portion of the enclosure composed of one or more construction elements with a specific fire resistance class and materials classified for reaction to fire. This band is intended to limit the horizontal or vertical spread of fire.



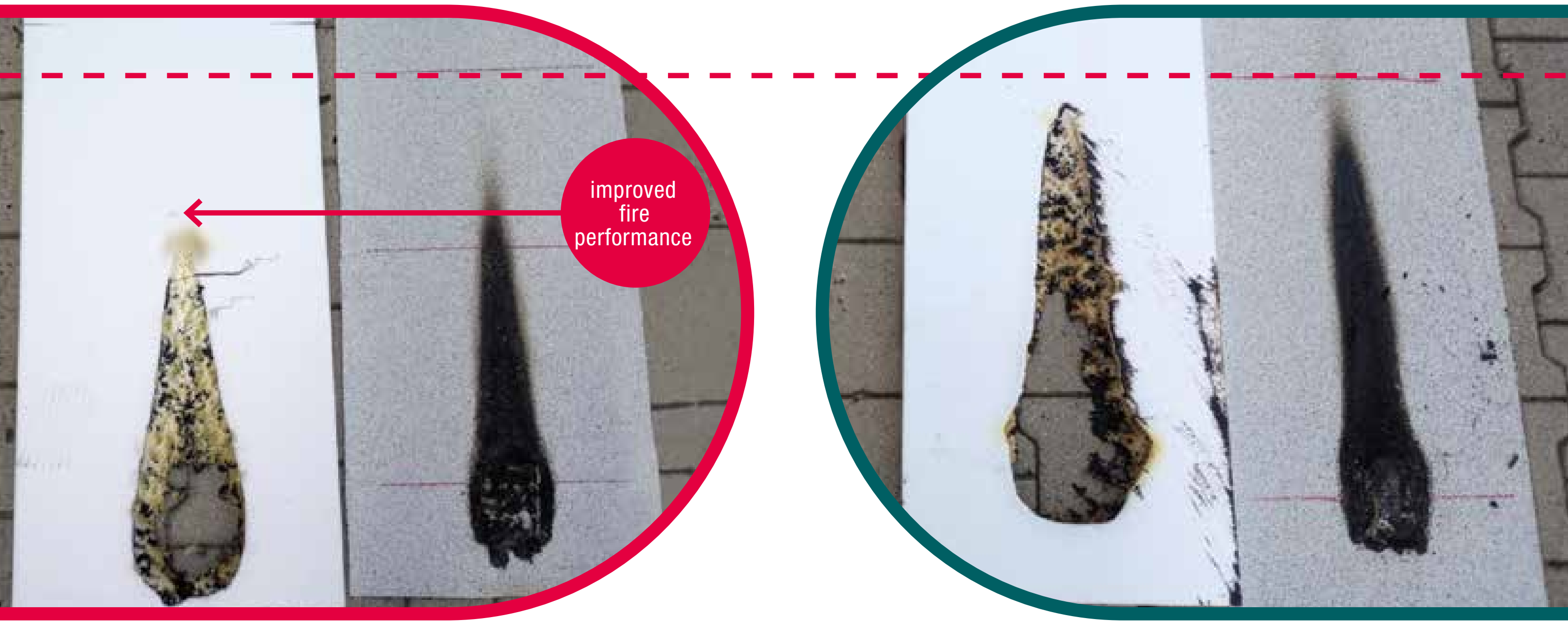
Example of separation and protection bands for plants and fuels

Classification

	SA	SB	SC
Building types	 -1 m < h ≤ 12 m	 h ≤ 24 m including basement	 h > 24 m including basement
Definition	Buildings with all floor levels between -1 m< h ≤ 12 m, overall crowding s 300 occupants and do not include compartments with Ris equal to D1, D2. Above ground, singlestorey buildings.	Buildings having heights of all floors at h 24 m and not including compartments with Life Space Risk equal to D1, D2.	Other buildings not contained in the previous classes.
Required external fire performance	None except if they include compartments with Life Space Risk = D1 or D2.	Class $B_{ROOF}(t2)$ separation strips, $B_{ROOF}(t3)$, $B_{ROOF}(t4)$ or in fire resistance class EI 30 at the projections of the subdivision construction elements.	Entire roof in $B_{ROOF}(t2)$, $B_{ROOF}(t3)$, $B_{ROOF}(t4)$ or fire resistance class EI 30.

XFIRE membranes

The new XFIRE waterproof membranes have been developed to meet the growing need for fire protection in buildings. Polyglass has created a range of products to meet all design and application requirements, improving the performance of the materials in terms of both fire resistance and applicability.



EPS substrate **XFIRE membranes** **EPS substrate** **Ordinary membranes B_{ROOF}**

Test B_{ROOF}(t2)

XFIRE membranes **Standard membranes**

Application test

Fire and hail-resistant bituminous products

Futura XFIRE P
4 mm + G F

Futura XFIRE P
4 mm S F

Polyflex XFIRE P
4 mm + G F

Polybond XFIRE P
4,5 kg G F

Antiradice XFIRE P
4 mm S F

FIRE RESISTANCE

HAIL RESISTANCE

ANTIRADICE

TEST AND NORM
The XFIRE range is classified $B_{ROOF}(t2)$ according to EN 13501-5

SUBSTRATE
Any combustible and non-combustible substrate with density ≥ 13.2 kg/m^3 per slope

The ***XFIRE range*** *meets* ***fire*** *regulations and is also* ***available*** *in* ***hail-resistant*** *and* ***root-resistant*** *versions*

Technical characteristics and fields of application

XFIRE RANGE	VERSIONS	ROOFS EN 13707	UNDERLAY FOR DISCONTINOUS ROOFING EN 13859-1	FOUNDATIONS EN 13969	VAPOUR BARRIER EN 13970	BRIDGES AND VIADUCTS EN 14695
Futura XFIRE P	4 mm + G F	●				
	4 mm S F	●				
Polyflex XFIRE P	4 mm + G F	●				
Polybond XFIRE P	4,5 kg G F	●	●			
Antiradice XFIRE P	4 mm S F	●				

LEGEND: **G** - Chippings | **F** - Heat-fusible polyethylene film | **S** - Sand

CERTIFICATE	SINGLE-PLY	IGLAE CLASS	COLD FLEXIBILITY EN 1109	TENSILE STRENGTH EN 12311-1	ELONGATION AT BREAK EN 12311-1	HAIL RESISTANCE EN 13583: 2012
B_{ROOF}(t2)-(t3)*	●	S	≤ -25	950/850 (±20%)	45/50 (±15)	●
B_{ROOF}(t2)-(t3)*	●	S	≤ -25	950/850 (±20%)	45/50 (±15)	
B_{ROOF}(t2)-(t3)*	●	S	≤ -20	850/750 (±20%)	40/50 (±15)	●
B_{ROOF}(t2)-(t3)*			≤ -15	800/700 (±20%)	40/50 (±15)	
B_{ROOF}(t2)-(t3)*		1	≤ -15	800/700 (±20%)	40/50 (±15)	

* Please ask Technical Department for certified availability systems.

XFIRE for the entire building prevention

The new XFIRE range has been developed to meet all design requirements in terms of fire protection and impermeability.

In addition to roofs with exposed membranes, our design focus also extends to ballasted, green, gravel or floating floor coverings. These types of protection are not always considered effective protection against potential fires that could develop on them. Through incandescent drips, leaks could reach the underlying impermeable layers or organic material accumulated over time under such protections, causing a fire.

COVER WITH PHOTOVOLTAIC SYSTEMS

GREEN ROOF COVERINGS

PRACTICABLE COVERS

BASEMENT ROOFING

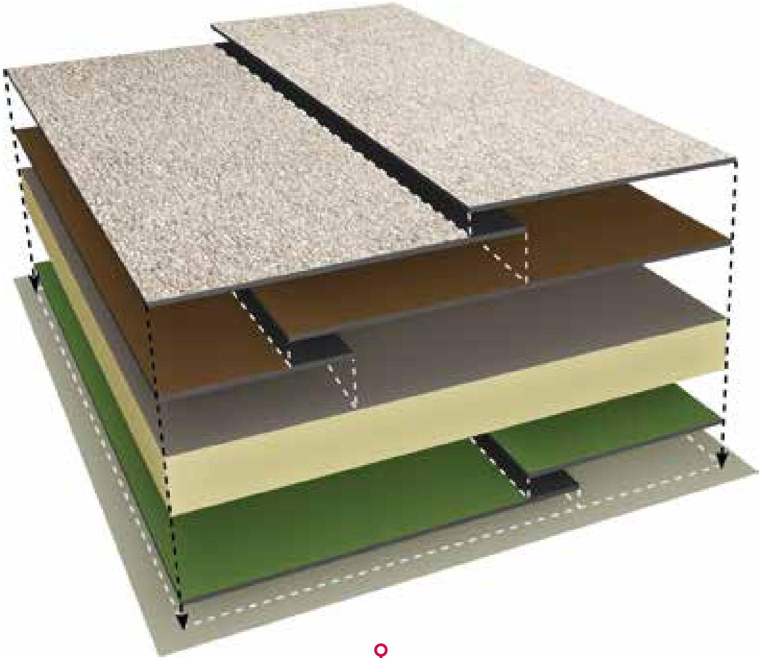
VISIBLE ROOFING

BALLASTED ROOFING

System type
Warm roofing with exposed waterproofing

DESIGN FEATURES

$B_{ROOF}(t2)$	HAIL RESISTANCE	ROOT RESISTANCE	COOL ROOF	IGLAE CONFORMITY	BUREAU VERITAS ITALY COMPLIANT*
•	•		•	•	•

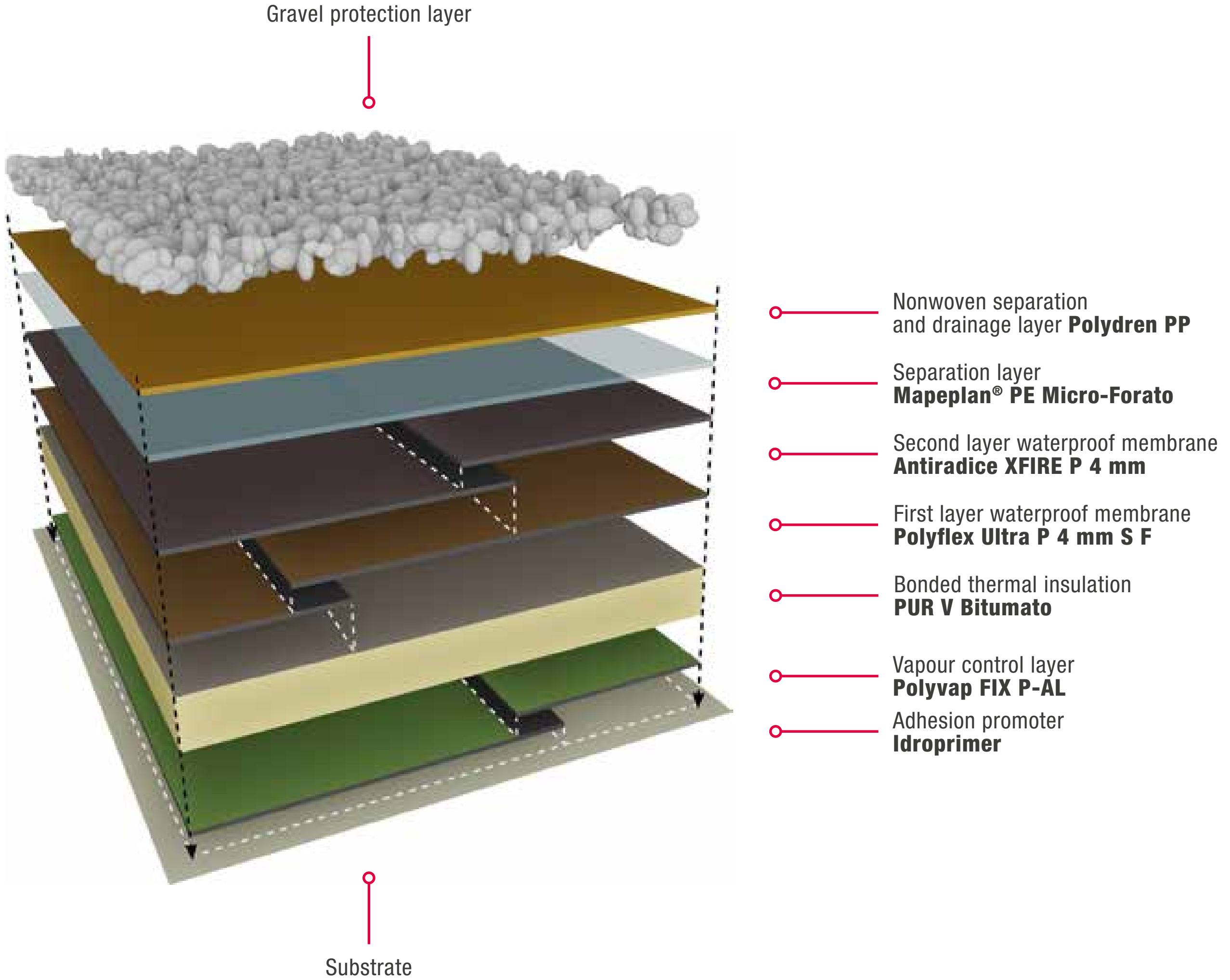


** According to the applicable UNI standards and the IGLAE Code of Practice*

System type
Warm roofing under heavy mobile protection

DESIGN FEATURES

B_{ROOF}(t2)	HAIL RESISTANCE	ROOT RESISTANCE	COOL ROOF	IGLAE CONFORMITY	BUREAU VERITAS ITALY COMPLIANT*
•	•	•		•	

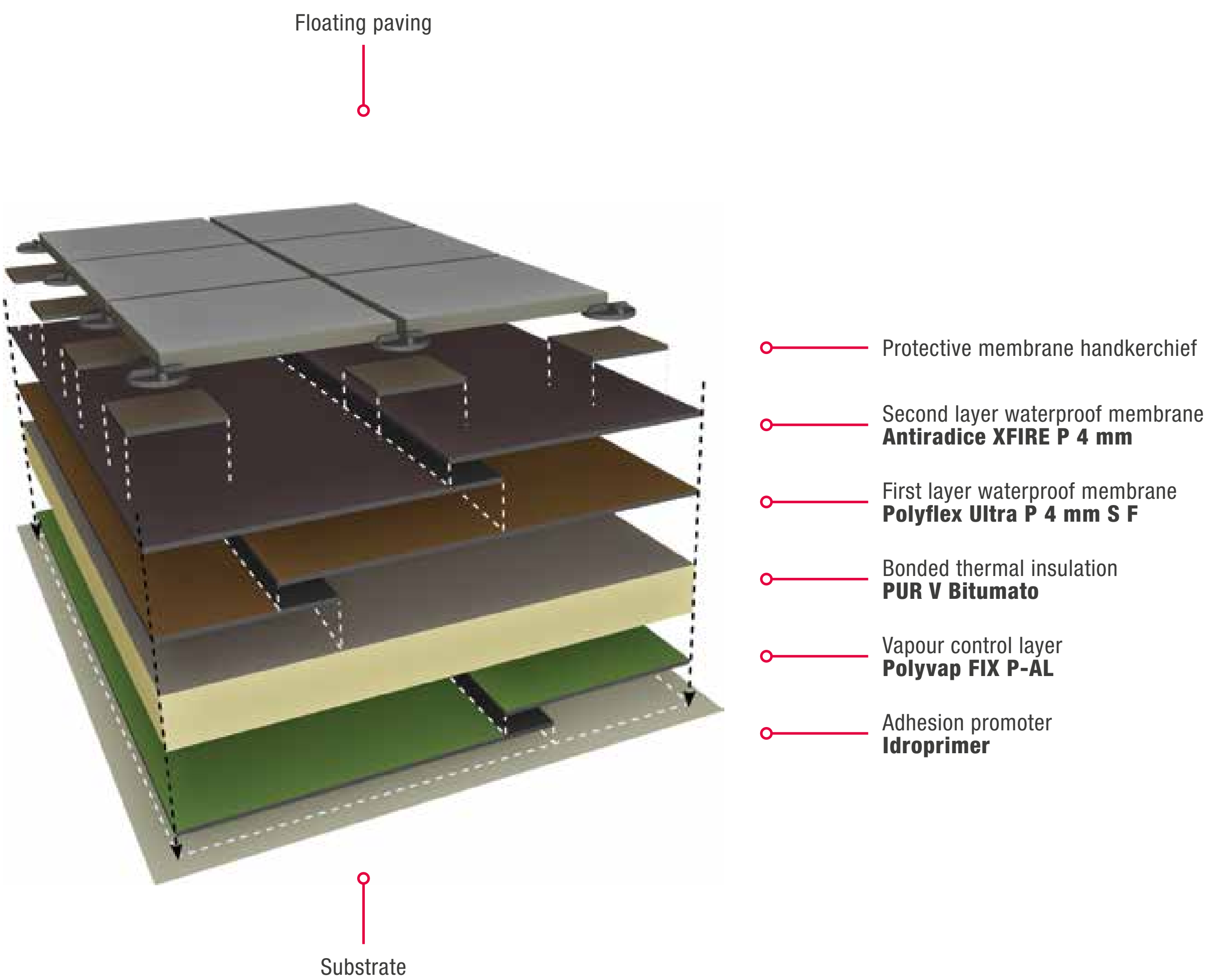


According to the applicable UNI standards and the IGLAE Code of Practice

System type
Warm roofing walkable with floating floor

DESIGN FEATURES

BROOF(t2)	HAIL RESISTANCE	ROOT RESISTANCE	COOL ROOF	IGLAE CONFORMITY	BUREAU VERITAS ITALY COMPLIANT*
●	●	●		●	●

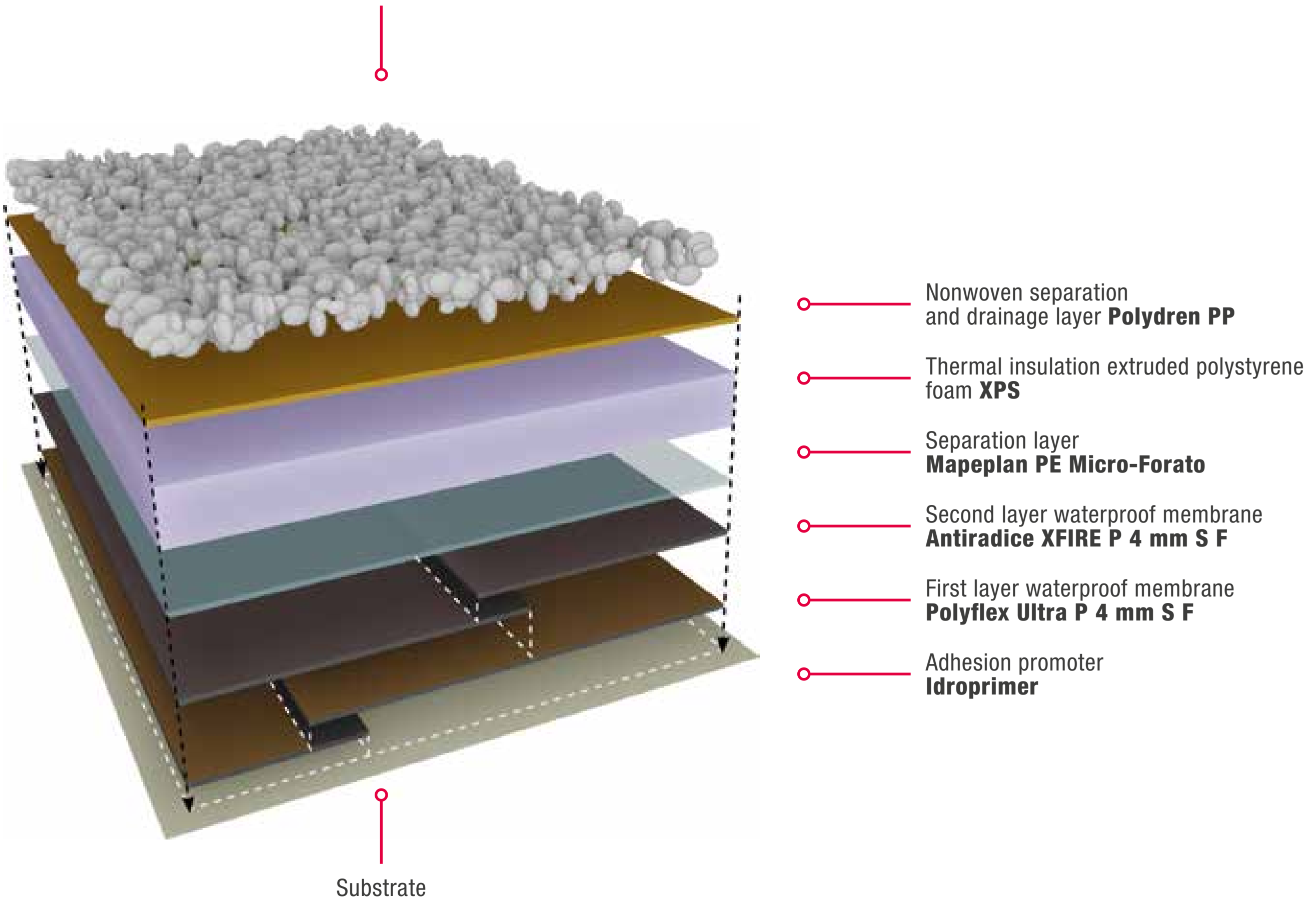


** According to the applicable UNI standards and the IGLAE Code of Practice*

System type
Inverted roof covering under heavy mobile protection

DESIGN FEATURES

$B_{ROOF}(t2)$	HAIL RESISTANCE	ROOT RESISTANCE	COOL ROOF	IGLAE CONFORMITY	BUREAU VERITAS ITALY COMPLIANT*
•	•	•		•	•

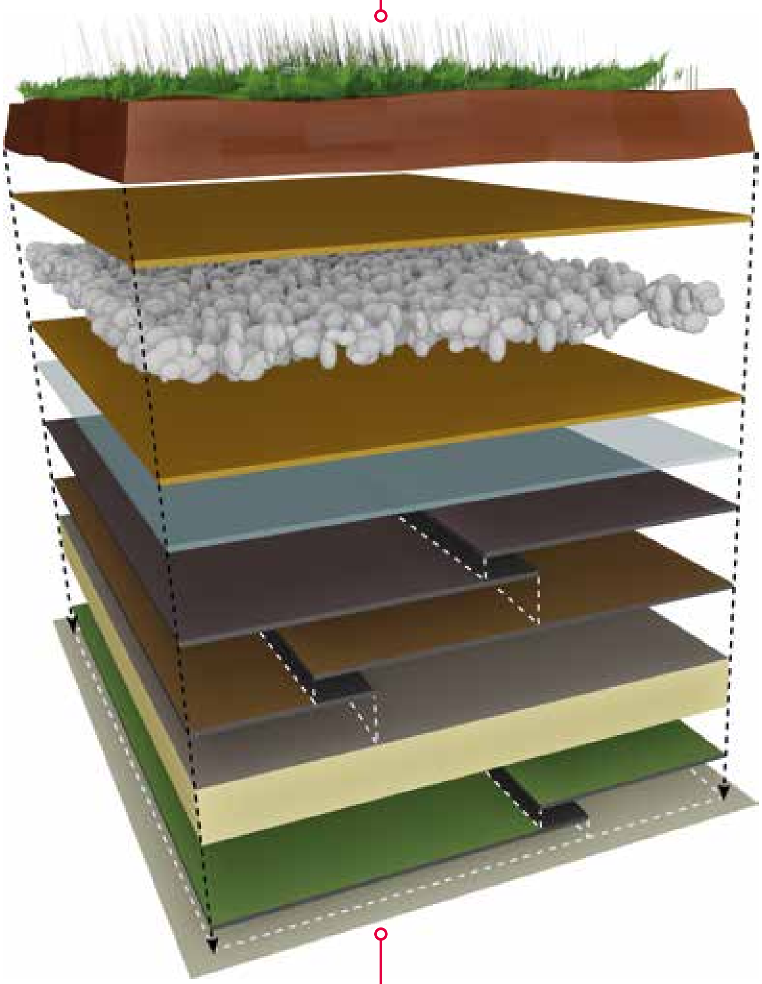


** According to the applicable UNI standards and the IGLAE Code of Practice*

System type
Green roof covering for warm roofs

DESIGN FEATURES

BROOF(t2)	HAIL RESISTANCE	ROOT RESISTANCE	COOL ROOF	IGLAE CONFORMITY	BUREAU VERITAS ITALY COMPLIANT*
•	•	•	•	•	•



** According to the applicable UNI standards and the IGLAE Code of Practice*

Selection guide
Fire resistant polymer bitumen based membranes

XFIRE PRODUCTS

PRODUCT NAME	TYPE OF COMPOUND	COLD FLEXIBILITY (°C)	TENSILE STRENGTH (L/T) (N/50 mm)	BEHAVIOUR EXTERNAL FIRE*
Futura XFIRE P 4 mm + G F	APP	≤ -25	950/850 (±20%)	B_{ROOF}(t2)-(t3)**
Futura XFIRE P 4 mm S F	APP	≤ -25	950/850 (±20%)	B_{ROOF}(t2)-(t3)**
Polyflex XFIRE P 4 mm + G F	APP	≤ -20	850/750 (±20%)	B_{ROOF}(t2)-(t3)**
Polybond XFIRE P 4,5 kg G F	APP	≤ -15	800/700 (±20%)	B_{ROOF}(t2)-(t3)**)
Antiradice XFIRE P 4 mm S F	APP	≤ -15	800/700 (±20%)	B_{ROOF}(t2)-(t3)**

** Fire ratings refer to systems certified in accordance with the provisions of the standard according to the type of test performed.*
*** Please ask Technical Department for certified availability systems.*

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Polyglass SpA
Registered Office: V.le Edoardo Jenner, 4 - 20159 Milan - Italy
Administrative and Production Headquarters: Via Giorgio Squinzi, 2 - 31047 Ponte di Piave (TV) - Italy
Tel. +39 04227547 - E-mail: info@polyglass.it - www.polyglass.com