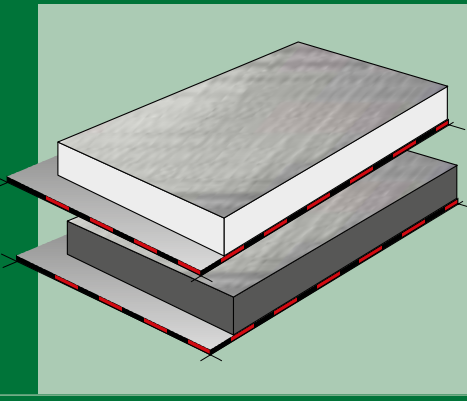


# ISOBASE REFLECTIVE

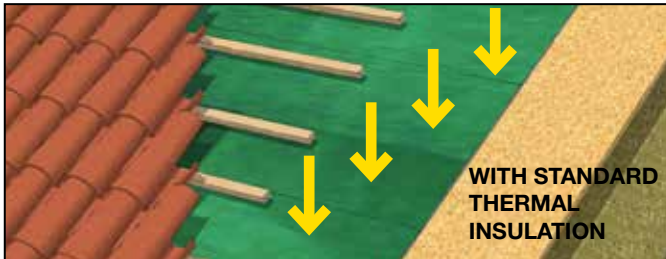
• ISOBASE PSE REFLECTIVE • ISOBASE PSE GRAPHITE REFLECTIVE

THERMO-REFLECTIVE INSULATION PANELS FOR THE AIR SPACES OF VENTILATED AND MICRO-VENTILATED SLOPING ROOFS WITH UPPER FACE COVERED BY A LOW-EMISSION UNDERLAY SHEET, REFLECTING IR THERMAL RADIATION AND RF ELECTROMAGNETIC RADIATION AND THE LOWER FACE COUPLED TO AN ALUMINIUM/POLYESTER COMPOSITE STEAM BARRIER.



GRANTS *LEED* CREDITS

## 1 PROBLEM



## HOW TO INCREASE THE REFLECTANCE OF THERMAL INSULATION FACING AIR SPACES

The thermal insulation normally used in building in the air spaces of walls or ventilated or micro-ventilated roofs is normally cellular or fibrous material with low thermal conductivity but, generally speaking, since these products have high-emissivity and low-reflectance surfaces, they do not have sufficient capacity to reduce the transmission of heat occurring as a result of irradiation between the two surfaces facing the air space. They also involve difficult installation operations to provide protection against steam and water.

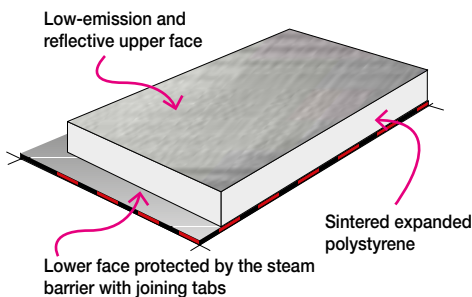
## 2 SOLUTION

The **ISOBASE REFLECTIVE** range of thermal insulation products, used in the air space of ventilated and micro-ventilated sloping roofs, have low thermal conductivity, extremely low thermal emissivity and a high thermal reflectance which, compared with a standard high-emission and non-reflecting panel, allow the required thermal resistance to be obtained with a lower thickness. They are also rapidly installed as they are already protected by an underlay sheet and a steam barrier.

The **ISOBASE REFLECTIVE** range of thermal insulation products may be qualified as type 1 parallel-face and constant thickness thermo-reflective insulation conforming with standard UNI EN 16012:2012, with a low thermal conductivity expanded material core and with at least one extremely low emissivity face which reduces heat dispersion from the heated rooms underneath towards the cold face of the air space in the winter and reflects the IR thermal radiation of the hot face of the air space in the summer, both when it is formed of the lower face of the roof tiles and when it is formed of the lower face of an OSB panel.

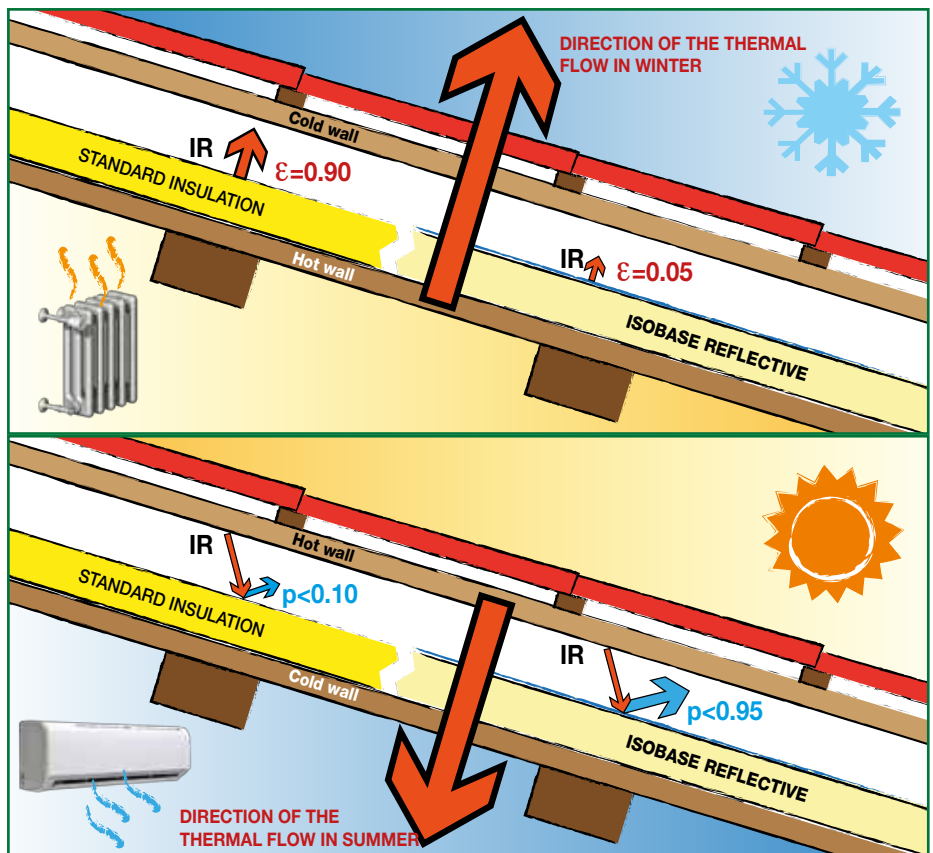
## DESCRIPTION

**ISOBASE REFLECTIVE** panels are formed of an expanded cellular material with the upper face protected by a waterproof underlay sheet with a pure aluminium reflecting face, while the lower face is coupled with an aluminium/polyester composite steam barrier which overhangs on two sides.



## ADVANTAGES

- The thermo-reflective covering allows the panel thickness to be reduced.
- It is already protected by the steam barrier.
- The upper face is waterproof and does not need to be protected by an underlay sheet.
- The roof tile battens are installed directly on the panel.



**ISOBASE REFLECTIVE** is effective in both summer and winter, but it must be remembered that the thermo-reflective effect only occurs in the presence of an air space and if this is absent, i.e. the overlying layers rest directly on the panel, the action of the metal shield is lost and the thermal insulation will be due solely to the thermal resistance of the expanded material core.

The thermal resistance of **ISOBASE REFLECTIVE** is the result of both the thermal conductivity of the expanded core and the emissivity of the low-emission reflective shield and also the dimensions of the air space and the amount of ventilation, so thermal resistance must be calculated specifically case by case by the thermo-technician and will be expressed not as the thermal resistance of the panel ( $R = s/\lambda$ ) but as the **thermal resistance of the Rt system** which takes the various parameters into account. In ventilated and micro-ventilated roofs, the situation is complicated by the movement of the air mass, particularly in the summer, so the ANIT (National thermal and acoustic Insulation Association) has provided thermo-technicians with calculation software for this purpose. Several examples to guide the user are provided below.

**ISOBASE REFLECTIVE** also acts as protection against high RF electro-magnetic waves from radio antennas and television transmitters and can offer a high degree of protection of the rooms underneath. However, it does not protect against the electromagnetic fields of ELF power lines.

The tests carried out according to standard MIL-STD 285 on the individual underlay sheet gave the following results:

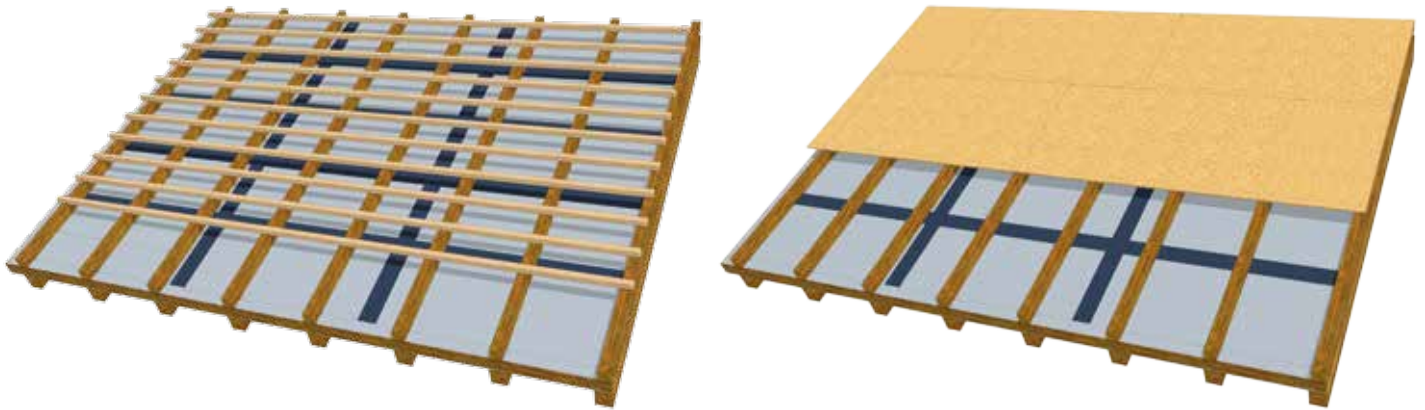
- Screening power 100 MHz: 29.00 dB; Damping percentage 96.50%
- Screening power 900 MHz: 38.00 dB; Damping percentage 98.70%
- Screening power 30÷1000 MHz: 40 dB, which means the electromagnetic field is reduced by 95 times.

The protective effect will be further increased by the aluminium foil of the steam barrier.

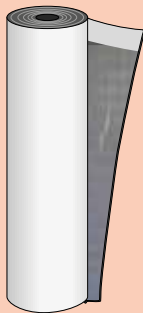


## APPLICATION FIELDS

**ISOBASE REFLECTIVE** is applied on sloping roofs under battens which lead directly to roof tiles, corrugated sheets or the battens can lead to a continuous OSB board on which to create various waterproofing systems like continuous coverings in polymer-bitumen membranes, discontinuous coverings in bitumen tiles or discontinuous coverings in roof tiles. **It is essential for there to be a ventilated or micro-ventilated air chamber between the ISOBASE REFLECTIVE insulation and the sealing elements for the system to function correctly.**



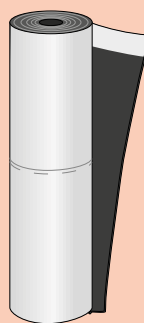
## Installation accessories



**SELFTENE REFLECTIVE** is a 0.5 mm mono-adhesive elastomer distillate bitumen-polymer membrane with the upper face formed of a low-emissivity and high-reflectance aluminium film, reinforced with a "non-woven" polyester fabric. It is used in 10 cm wide strips to seal the joining lines of the ISOBASE REFLECTIVE panel and also serves for waterproof joints to the projecting elements of the roof, the metal gutter, the perimeter crowning elements and the intersections between installation surfaces, etc.

**SELFTENE REFLECTIVE** is also type 4 thermo-reflective insulation conforming with UNI EN 16012 and may be used for the entire height to give therm-reflective properties to the surfaces facing an air space, to which it is glued.

Available dimensions: 1×30 m; 0.50×30 m; 0.33×30 m; 0.25×30 m; 0.20×30 m; 0.10×30 m.



**SELFTENE BASE HE POLYESTER** is an elastomer distillate bitumen-polymer membrane reinforced with "non-woven" polyester fabric composite stabilised with fibre-glass, with a self-adhesive mixture protected with a siliconate film spread on the lower face, while the other face is protected with a Flamina film. It serves as the first joining strip between the panel and the crowning elements, which must be protected against the metal panels.

Available dimensions: 1×15 m; 0.50×15 m; 0.33×15 m; 0.25×15 m; 0.20×15 m; 0.10×15 m.



**SELFTENE BV HE BIADESIVO POLYESTER** is an elastomer distillate bitumen-polymer membrane reinforced with "non-woven" polyester fabric composite stabilised with fibre-glass, with a self-adhesive mixture spread on both faces. Both sides are protected with a siliconate film. It is used for sealing mechanical fixing devices of wooden battens. Available dimensions: 0.10×20 m.



**INDEVER PRIMER E** is a quick-dry solvent-based bitumen primer with additive to adhere even to slightly damp surfaces and assist adhesion of self-adhesive products on cement surfaces.

Packaging dimensions available: 5 and 20 litre can.

## METHOD OF USE

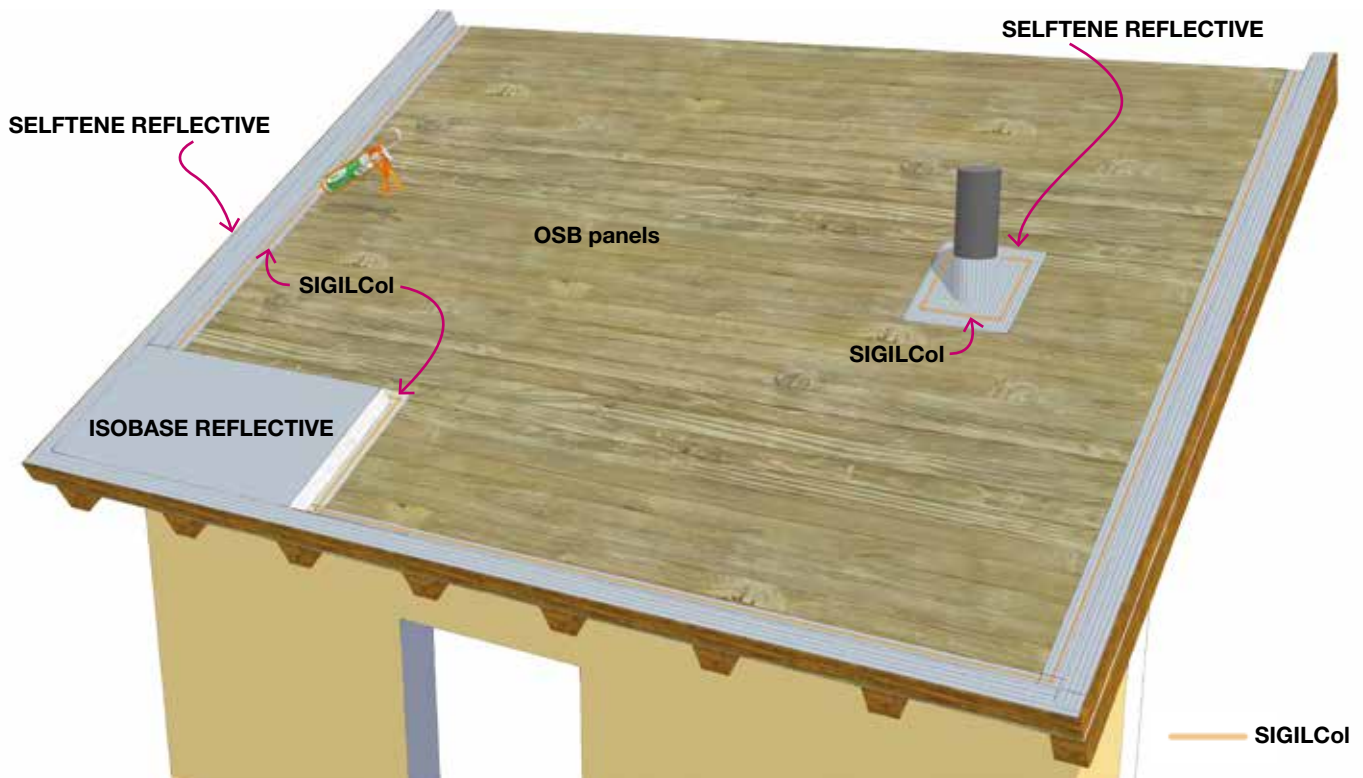
### • PREPARATION OF THE LAYING SURFACE

After placing a ratchet at the gutter line and preparing the side containment elements, the elements projecting from the laying surface are covered with **SELTENE REFLECTIVE** strips, which must rise up the vertical surfaces to at least 2 cm above the panel thickness and leaving a 5 cm turn-up on the perimeter side containment and gutter battens.

The strips on the flat part must have a 8 ÷ 10 cm turn-up on the flat part. A rubber roller is used for adhesion of the strips. All the valley lines or similar are seal with a **SELTENE REFLECTIVE** strip.

The panels are then joined to the strips with **SIGILCOL** sealant.

A primer is not needed to ensure the strips adhere to OSB boards, while solid wood boards and battens may require a first coat of 150 g/m<sup>2</sup> of the **FONOCOLL** water-based polymer adhesive. Cement surfaces must be treated with the **INDEVER PRIMER E** solvent-based bitumen primer.



## Installation accessories



**SIGILCOL** is a universal adhesive sealant which adheres to metal, steel sheet (stainless steel and painted), aluminium, glass, wood, cement, enamelled surfaces, polystyrene and stiff plastic materials. It is used for sealing overlaps of the tabs of the lower face of ISOBASE REFLECTIVE and for sealing around the projecting parts covered with SELTENE REFLECTIVE strips. It is also used to glue the wooden battens to the ISOBASE REFLECTIVE panel to create different elements and may also be used to glue the panel.

Packaging dimensions available: 290 ml cartridges in 12-piece boxes.



**MASTICOLL** is a solvent-based bitumen mastic for gluing ISOBASE REFLECTIVE insulation panels to a cement support.

Packaging dimensions available: 25 kg can.



**HEADCOLL** is a solvent-based bitumen glue for gluing ISOBASE REFLECTIVE insulation panels to a cement and wood support.

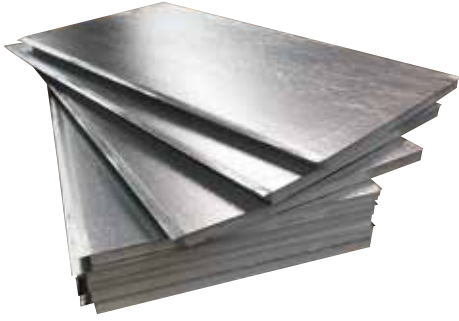
Packaging dimensions available: 5 kg can, 280 ml cartridges in 25-piece boxes.



**FONOCOLL** is an acrylic resin based transparent adhesive prime in a water solution to assist adhesion of self-adhesive products to solid wood boards

Packaging dimensions available: 5 and 10 kg pails.

• LAYING THE PANELS



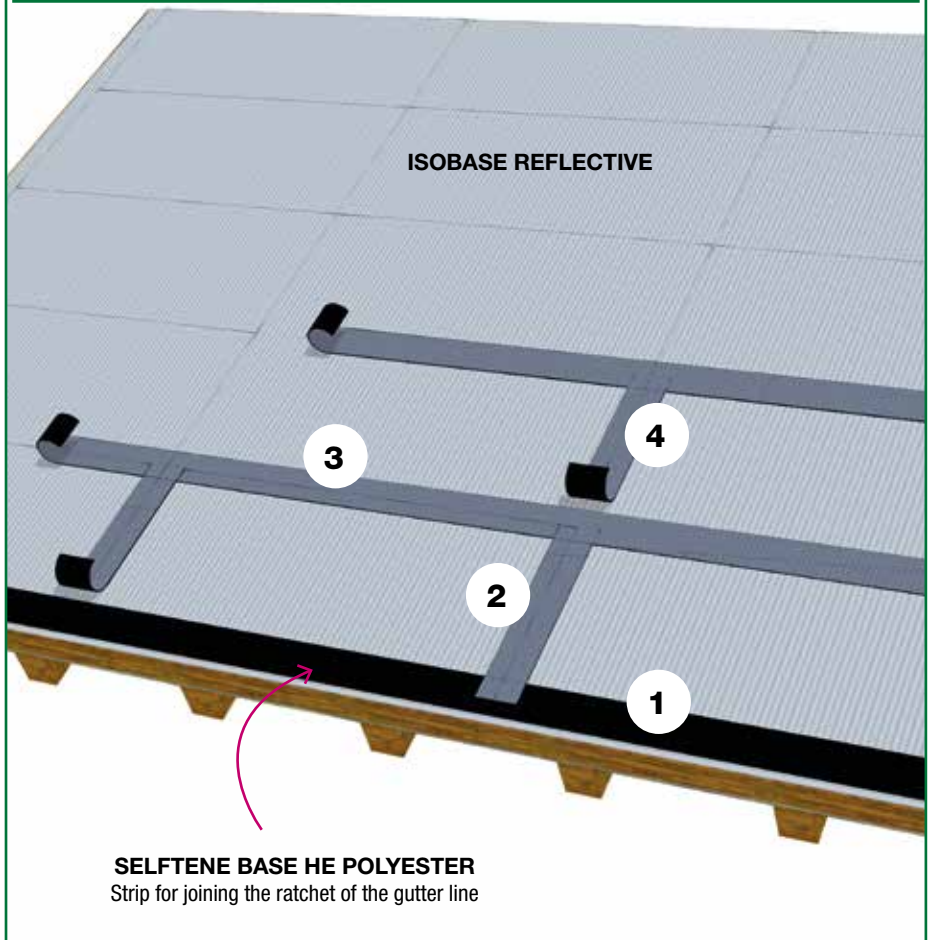
Starting at the gutter lines, the panels are arranged with the overlap of the steam barrier in the opposite direction to the gutter line and gradually mounted dry, over the joining tabs of the steam barrier. In order to avoid a gust of wind lifting the panels during laying operations, the steam barrier overhangs can be stapled to wooden boards or a strip of HEADCOLL cartridge sealant adhesive can be spread on the panel. A strip of HEADCOLL cartridge sealant adhesive or two or three drops of MASTICOLL solvent-based bitumenous adhesive are spread on cement surfaces under the panel.

The steam barrier tab overlaps are sealed with a continuous seam of SIGILCOL cartridge universal sealant adhesive, while the join lines of the upper face are sealed with a 10 cm wide SELFTENE REFLECTIVE strip placed over them. The insulation panel is joined to the ratchet with a SELFTENE BASE HE POLYESTER (1) strip, which is laid first, followed by the roof tile adhesive strips, proceeding as shown in the figure, starting at the gutter line and gluing the perpendicular strips (2), then the one parallel to the gutter (3), and then starting again by gluing the perpendicular strips (4) and so on.

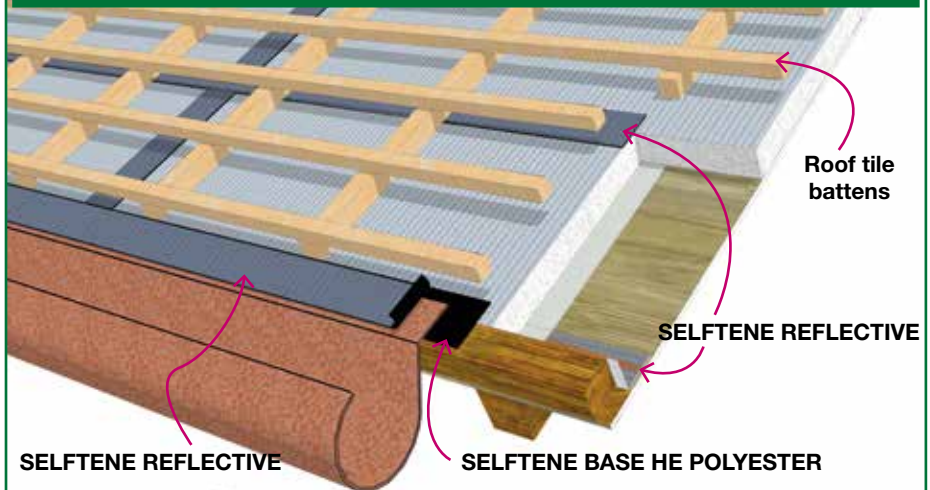
The join between the steam barrier of the lower face of the panel and the SELFTENE REFLECTIVE strip spread on the laying surface is obtained with a seam of SIGILCOL.

Lastly, the insulation panel is joined to the gutter metal with a SELFTENE REFLECTIVE strip. The side crowning elements are joined in the same manner with SELFTENE REFLECTIVE strips. Accidental damage to the reflective shield of the panel can be repaired with SELFTENE REFLECTIVE strips.

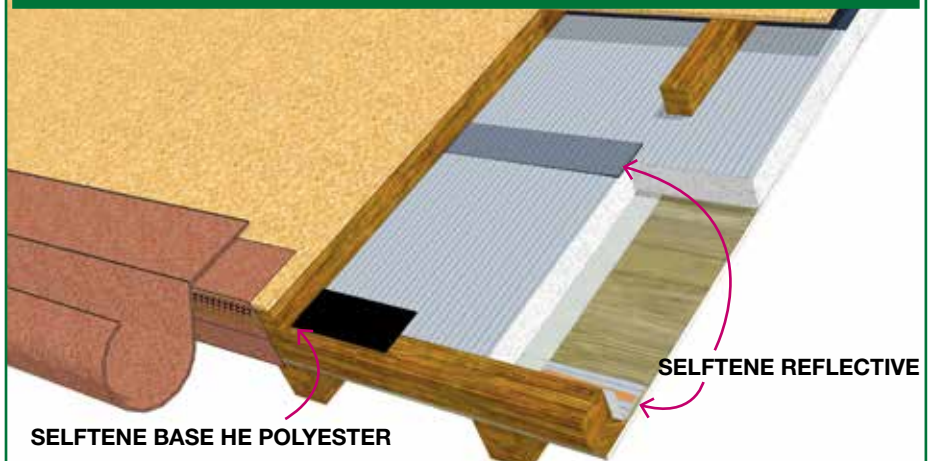
SEALING OF JOIN LINES OF THE UPPER FACE AND THE JOIN TO THE RATCHET



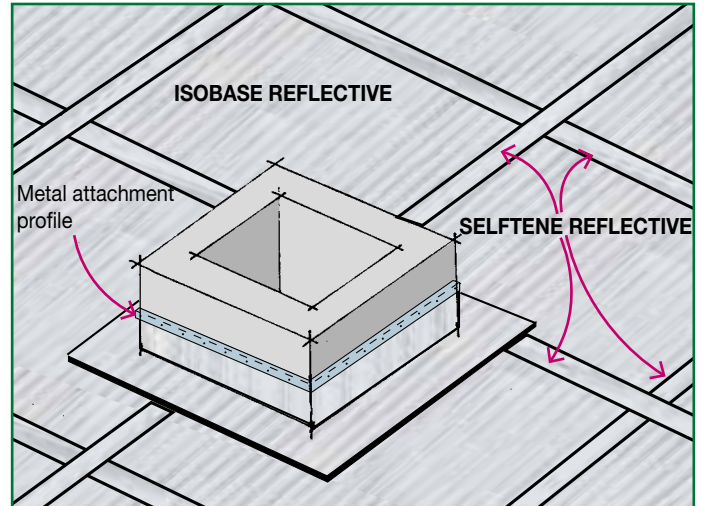
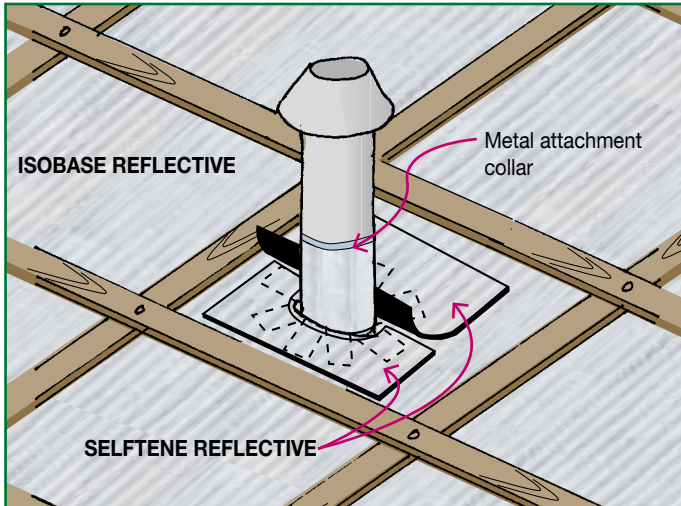
ROOF WITH TILES ON BATTENS, JOINING ISOBASE REFLECTIVE TO THE GUTTER



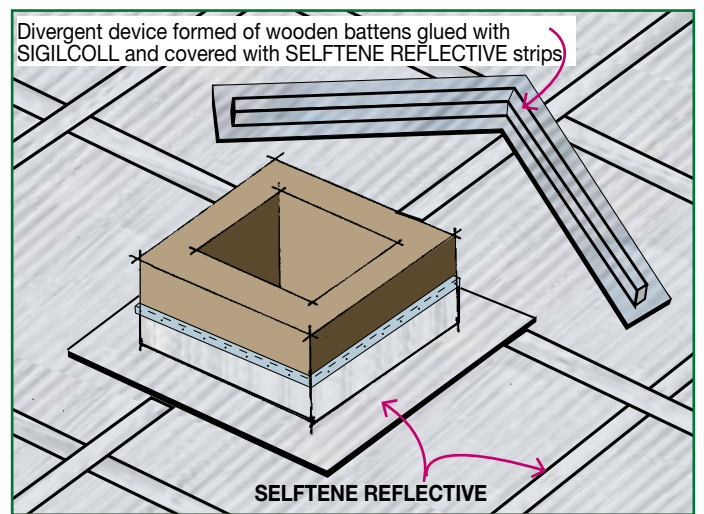
VENTILATED OSB BOARD, JOINING ISOBASE REFLECTIVE TO THE WEATHER MOULDING



The joining operations to the projecting elements are also repeated for the reflective shield, always using the SELFTENE REFLECTIVE strips, which are fixed with metal collars or profiles on the vertical part. The projecting elements will then be covered with specific accessory elements of the various covering types, whether roof tiles or other.

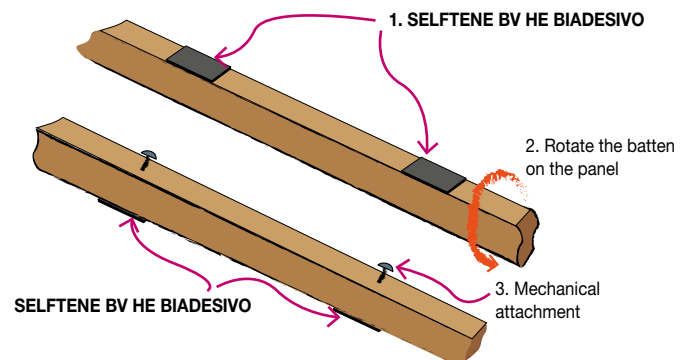


At the projecting parts of the roof, such as chimneys, skylights, etc., a rainwater deflecting device is installed to deflect water drops which could infiltrate from the overlying layers, formed of two wooden battens of maximum 2 cm thickness, which are arranged in an upside-down V shape upstream of the projecting part and which are glued to the **ISOBASE REFLECTIVE** panel with SIGILCOLL universal adhesive sealant. The battens will then be covered with a SELFTENE REFLECTIVE strip.

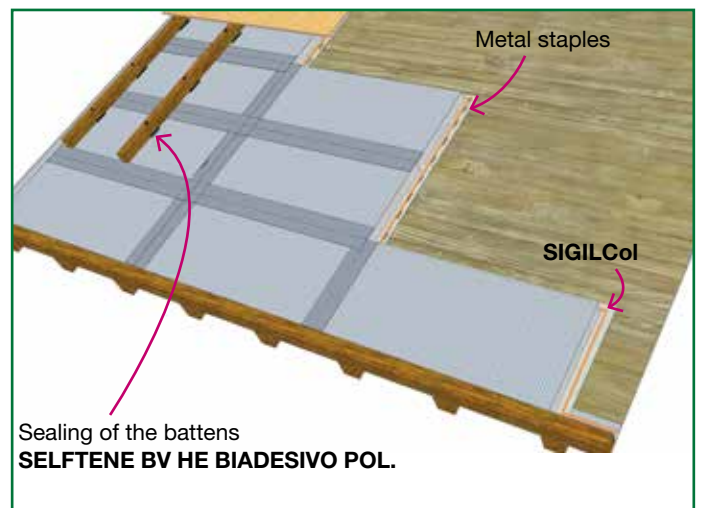


• **SEALING OF THE BATTENS**

In order to avoid infiltrations where the batten nails are positioned, in points where mechanical attachment is planned, pieces of SELFTENE BV HE BIADESIVO strips are glued on the face of the batten which rests on the insulation panel and, after removing the siliconate film covering the other side of the strip, the battens are installed and attachment carried out only in the areas treated in this manner.

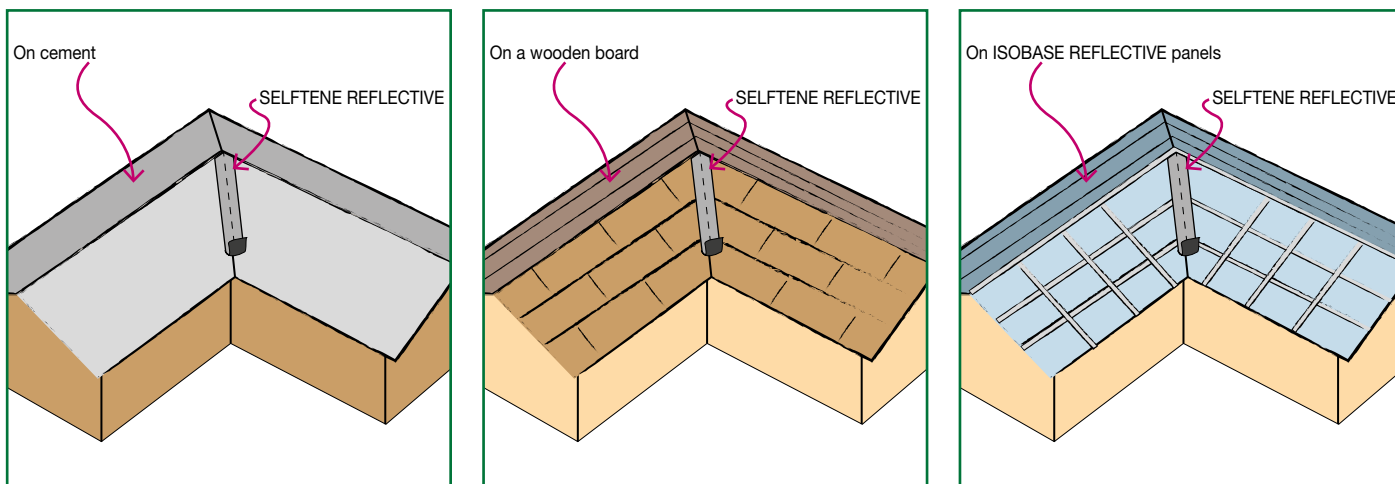


Alternatively, as suggested by several roof tile manufacturers, it is also possible to spread a low-expansion polyurethane adhesive on the lower face of the batten, which after nailing and reaction, will be trimmed off on the sides of the batten and seal it.



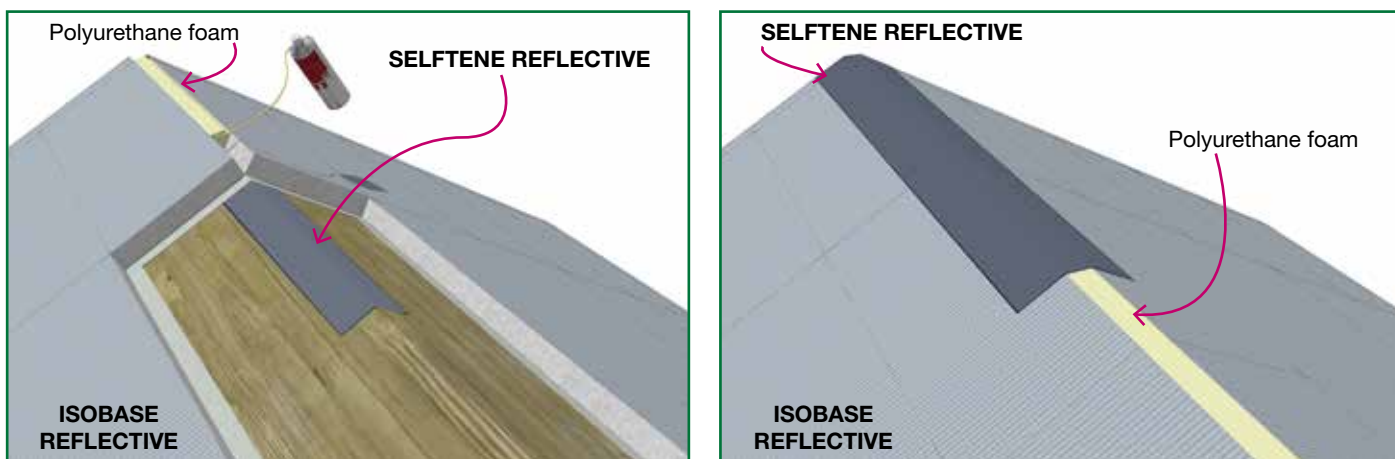
### • VALLEY

The valley lines of both the installation surface and the **ISOBASE REFLECTIVE** panel bed will be covered with a **SELTENE REFLECTIVE** strip at least 33 cm in width positioned over the valley lines to act as flashing.



### • RIDGE, INTERSECTIONS BETWEEN DIFFERENT SURFACES OF THE ROOF

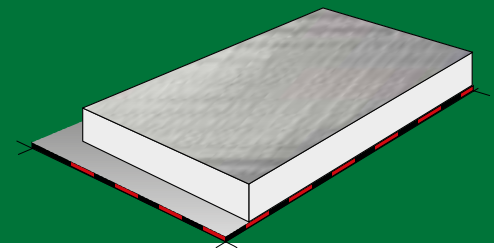
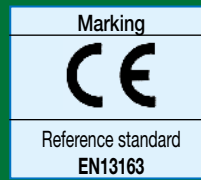
In the points of the roof where surfaces in different directions intersect, spaces are left between the panels which must be insulated to avoid creating thermal bridges. To avoid this problem, it is sufficient to fill the cavities with polyurethane foam in spray cans, then eliminate the excess with a cutter and cover everything with a SELTENE REFLECTIVE strip.



### • PRECAUTIONS

In order to avoid galvanic corrosion of the aluminium foil for mechanical attachments which cross the material, it is recommended to use stainless steel or galvanised nails, screws or staples. Galvanised ones should be used in a marine environment. Contact between the foil and elements in copper or lead or their alloys and also larch, chestnut or oak wood and any wood essence with a pH lower than 5 must be avoided. Compatible essences are: fir, spruce, Scots pine and poplar.

# ISOBASE REFLECTIVE PSE



CHARACTERISTICS				ENVIRONMENTAL						METHOD OF USE			
THERMAL INSULATION	ACOUSTIC INSULATION	WATERPROOF	REACTION TO FIRE	ECO GREEN	ASBESTOS FREE	TAR FREE	CHLORINE FREE	RECYCLABLE	NON DANGEROUS WASTE	EXHAUSTED OIL FREE	MECHANICAL FIXING	APPLY WITH COLD ADHESIVE	APPLICATION WITH TECTENE BY STRIP

## DESCRIPTION

**ISOBASE REFLECTIVE PSE** is a type 1 thermo-reflective panel conforming with UNI EN 16012, with self-extinguishing sintered polystyrene foam based flat parallel faces of uniform thickness, both hot-joined to a polyester/aluminium composite sheet which overhangs on two sides on the lower face, which is the steam barrier.

The polyester/aluminium covering on both sides can act either as a steam barrier or as a low-emissivity thermo-reflective layer, as long as it faces an air space.

Sintered polystyrene foam is an inexpensive insulation which has been used for years on roofs. The expanded cell core of the panel is elastic and has low thermal conductivity which, in synergy with the thermo-reflective surface, allows the thickness of the thermal insulation to be reduced.

**ISOBASE REFLECTIVE PSE** is resistant to compression and is based high-density polystyrene foam. The compressive strength of the type destined for laying under battens is 150 kPa.

Starting at the gutter lines, the panels are

arranged with the overlap of the steam barrier opposite direction to the gutter line and gradually mounted dry. In order to avoid a gust of wind lifting the panels during laying operations, the steam barrier overhangs can be stapled to wooden boards or a strip of HEADCOLL cartridge sealant adhesive can be spread on the panel. A strip of HEADCOLL cartridge sealant adhesive or two or three drops of MASTICOLL solvent-based bitumenous adhesive are spread on cement surfaces under the panel.

The steam barrier tab overlaps are sealed with a continuous seam of SIGILCOL cartridge universal sealant adhesive, while the join lines of the upper face are sealed with a 10 cm wide SELFTENE REFLECTIVE strip placed over them. The insulation panel is joined to the gutter metal with a SELFTENE REFLECTIVE strip.

The join between the steam barrier of the lower face of the panel and the SELFTENE REFLECTIVE strip spread on the laying surface is obtained with a seam of SIGILCOL. The side crowning elements are joined in the same manner with SELFTENE REFLECTIVE strips. Accidental damage to the reflective

shield of the panel can be repaired with SELFTENE REFLECTIVE strips. ISOBASE REFLECTIVE should not be exposed to the elements and must be protected with subsequent layers within 7 days of laying.

Panel dimensions:  
• 2,000×1,000 mm

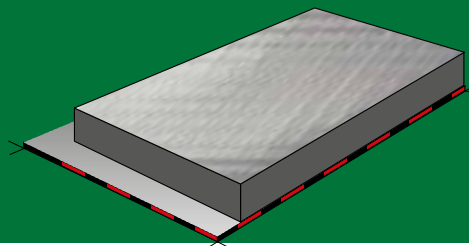
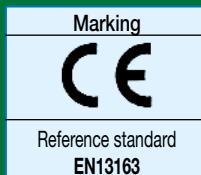
## TECHNICAL CHARACTERISTICS

Standard		ISOBASE REFLECTIVE PSE											
Intended uses		Th1B (air spaces)											
Designation code	<b>EN 13163</b>	EPS-EN 13163-T(2)-L(3)-W(3)-S(5)-P(10)-DS(N)5-BS200-CS(10)150											
Compressive strength at 10% compression	<b>EN 826</b>	≥150 KPa [ CS(10)150 ]											
Dimensional stability 48 h at 23°C with 90% R.H.	<b>EN 1604</b>	±0.5% [ DS(N)5 ]											
Bending strength	<b>EN 12089</b>	≥200 KPa [ BS200 ]											
Perpendicular tensile strength of the faces	<b>EN 1607</b>	NPD											
Thermal conductivity $\lambda_D$	<b>EN 12667</b>	0,034 W/mK											
Thickness <b>T(1)</b> (mm)		30	40	50	60	70	80	90	100	110	120	140	160
Thermal resistance $R_p$ (m <sup>2</sup> K/W) (*)		0.85	1.15	1.45	1.75	2.05	2.35	2.60	2.90	3.20	3.50	4.10	4.70
Thermal capacity (KJ/K·m <sup>2</sup> )		0.68	0.91	1.14	1.37	1.6	1.82	2.05	2.28	2.51	2.74	3.19	3.65
Long-term water absorption	<b>EN 12087</b>	<5%											
Steam transmission	<b>EN 12086</b>	$\mu = 30 \div 70$											
Reaction to fire	<b>EN 13501-1</b>	Euroclass E <sub>12</sub>											
Specific characteristics of the finish of the lower and upper face													
Waterproofing	<b>EN 1928-B</b>	W2											
Steam proofing	<b>EN 1931</b>	$\mu = 180\ 000$											
Thermal conductivity	<b>EN 12667</b>	0.2 W/mK											
Emissivity	<b>ASTM 1371.15</b>	0.05											
Thickness		0,112 mm											

(\*) The thermal resistance of the system must be calculated considering that the upper face has low emissivity and therefore allows the adjacent air space to be used optimally.

Soundproofing index. Sound absorption index. Impact noise transmission index Durability of reaction to fire, thermal resistance, resistance to compression. **NPD**

# ISOBASE REFLECTIVE PSE GRAPHITE



CHARACTERISTICS				ENVIRONMENTAL						MODALITÀ D'IMPIEGO			
THERMAL INSULATION	ACOUSTIC INSULATION	WATERPROOF	REACTION TO FIRE	ECO GREEN	ASBESTOS FREE	TAR FREE	CHLORINE FREE	RECYCLABLE	NON DANGEROUS WASTE	EXHAUSTED OIL FREE	APPLICAZIONE CON CHIODI	APPLICAZIONE CON ADESIVO A FREDDO	APPLICAZIONE CON TECTENE BY STRIP

## DESCRIPTION

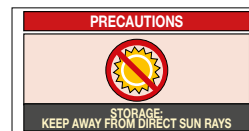
**ISOBASE REFLECTIVE PSE GRAPHITE** is a type 1 thermo-reflective panel conforming with UNI EN 16012, with self-extinguishing sintered polystyrene foam with added graphite based flat parallel faces of uniform thickness, both hot-joined to a polyester/aluminium composite sheet which overhangs on two sides on the lower face, which is the steam barrier. The polyester/aluminium covering on both sides can act either as a steam barrier or as a low-emissivity thermo-reflective layer, as long as it faces an air space. Sintered polystyrene foam is an inexpensive insulation which has been used for years on roofs. Its already low thermal conductivity has been improved by adding graphite and, in synergy with the thermo-reflective surface, it allows the thickness of the thermal insulation to be reduced.

**ISOBASE REFLECTIVE PSE GRAPHITE** is resistant to compression and is based high-density

polystyrene foam. The compressive strength of the type destined for laying under battens is 150 kPa. Starting at the gutter lines, the panels are arranged with the overlap of the steam barrier opposite direction to the gutter line and gradually mounted dry. In order to avoid a gust of wind lifting the panels during laying operations, the steam barrier overhangs can be stapled to wooden boards or a strip of HEADCOLL cartridge sealant adhesive can be spread on the panel. A strip of HEADCOLL cartridge sealant adhesive or two or three drops of MASTICOLL solvent-based bitumenous adhesive are spread on cement surfaces under the panel. The steam barrier tab overlaps are sealed with a continuous seam of SIGILCOL cartridge universal sealant adhesive, while the join lines of the upper face are sealed with a 10 cm wide SELFTENE REFLECTIVE strip placed over them. The insulation panel is joined to the gutter metal with a SELFTENE REFLECTIVE strip. The join between the steam barrier of the lower face of the panel and the

SELFTENE REFLECTIVE strip spread on the laying surface is obtained with a seam of SIGILCOL. The side crowning elements are joined in the same manner with SELFTENE REFLECTIVE strips. Accidental damage to the reflective shield of the panel can be repaired with SELFTENE REFLECTIVE strips. **ISOBASE REFLECTIVE PSE GRAPHITE** should not be exposed to the elements and must be protected with subsequent layers within 7 days of laying.

Panel dimensions:  
• 2.000x1.000 mm



## TECHNICAL CHARACTERISTICS

### ISOBASE REFLECTIVE PSE GRAPHITE

Standard	ISOBASE REFLECTIVE PSE GRAPHITE												
Intended uses	ThIB (air spaces)												
Designation code	<b>EN 13163</b>	EPS-EN 13163-T(2)-L(3)-W(3)-S(5)-P(10)-DS(N)5-BS200-CS(10)150											
Compressive strength at 10% compression	<b>EN 826</b>	≥150 KPa [ CS(10)150 ]											
Dimensional stability 48 h at 23°C with 90% R.H.	<b>EN 1604</b>	±0.5% [ DS(N)5 ]											
Bending strength	<b>EN 12089</b>	≥200 KPa [ BS200 ]											
Perpendicular tensile strength of the faces	<b>EN 1607</b>	NPD											
Thermal conductivity λ <sub>p</sub>	<b>EN 12667</b>	0,031 W/mK											
Thickness T(1) (mm)		30	40	50	60	70	80	90	100	110	120	140	160
Thermal resistance R <sub>p</sub> (m <sup>2</sup> K/W) (*)		0.95	1.25	1.60	1.90	2.25	2.55	2.90	3.20	3.50	3.85	4.50	5.15
Thermal capacity (KJ/K·m <sup>2</sup> )		0.68	0.91	1.14	1.37	1.6	1.82	2.05	2.28	2.51	2.74	3.19	3.65
Long-term water absorption	<b>EN 12087</b>	<5%											
Steam transmission	<b>EN 12086</b>	μ = 30÷70											
Reaction to fire	<b>EN 13501-1</b>	Euroclass E <sub>a2</sub>											
Specific characteristics of the finish of the lower and upper face													
Waterproofing	<b>EN 1928-B</b>	W2											
Steam proofing	<b>EN 1931</b>	μ = 180 000											
Thermal conductivity	<b>EN 12667</b>	0.2 W/mK											
Emissivity	<b>ASTM 1371.15</b>	0.05											
Thickness		0,112 mm											

(\*) The thermal resistance of the system must be calculated considering that the upper face has low emissivity and therefore allows the adjacent air space to be used optimally.

Soundproofing index. Sound absorption index. Impact noise transmission index Durability of reaction to fire, thermal resistance, resistance to compression. **NPD**

• FOR ANY FURTHER INFORMATION OR ADVICE ON PARTICULAR APPLICATIONS, CONTACT OUR TECHNICAL OFFICE • IN ORDER TO CORRECTLY USE OUR PRODUCTS, REFER TO INDEX TECHNICAL SPECIFICATIONS •

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The data provided in this publication is the result of laboratory tests or site surveys and repeatability of the results for equivalent systems is not guaranteed.

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