



Solutions for synthetic waterproofing

synthetic roofing
waterproofing
membrane
PVC

synthetic
roofing
waterproofing
membrane
pvc

PRACTICAL GUIDE TO **synthetic waterproofing**

FLAG PVC solutions for perfect waterproofing.

SOPREMA
GROUP

World market leader recognised for its waterproofing, roofing and insulation systems, **SOPREMA** stands above the crowd with a high quality product offer and competent technical assistance for all your projects.

a century of know-how



Independent

A partner you can trust

Since the company was founded in 1908, **SOPREMA** has grown into a major company, but it has retained its human dimension, and its strength lies in human relations. It sees them as one of the indispensable conditions for guaranteeing flexibility, creativity and quality of service.



Specialist

Tailored, high-performance solutions

Our Research & Development centres are constantly working on innovative solutions and revolutionary applications with very high added value. Whatever your project, we are sure to be able to offer a technically reliable solution compatible with each of your configurations.

Innovative

Committed to sustainable development

We place environmental quality at the heart of innovation. The "eco struction" label enables us to identify **SOPREMA's** environmentally friendly products and services: solvent-free products, natural or recycled raw materials, green roofs...



Flexible, lightweight PVC waterproofing membranes



Waterproofing membranes offered by SOPREMA are the perfect waterproofing solution for all types of installations.

Adaptable to the most complex architectural forms, whilst remaining a process that is weather-proof and resistant to pollution and UV rays.

Attractive, flexible, easy to apply, PVC waterproofing systems guarantee durable, high-performance waterproofing that extend building lifespans.

A variant of PVC, TPO (or FPO)* is a brand new generation of synthetic membranes made of thermoplastic polyolefins. These membranes made with polypropylene copolymers contain no plasticisers.

* TPO: ThermoPlastic Olefin, FPO: flexible polyolefin



Subsidiary of the **SOPREMA** group since 2007, **FLAG** has been one of the world market leaders in the manufacturing of synthetic waterproofing membranes (TPO/PVC) since 1963. The **FLAG** product range covers waterproofing solutions for roofing, civil engineering, swimming pools and hydraulic structures.

Selected to provide the waterproofing on many prestigious projects, **FLAG** has established itself as a recognised player and always at the forefront of Research and Development. Thanks to this dynamic, **FLAG** products are concentrates of the very best technological concepts and research.

Safety and environment

Because they are not very flammable and can be welded with hot air, PVC membranes contribute as much to the safety of the buildings they are installed on as to that of the workers who install the waterproofing.



Durability

FLAG's PVC waterproofing solutions provide buildings with good weather protection as well as high UV resistance, at the same time as guaranteeing effective and long-lasting waterproofing.



Aesthetics

These products allow for great architectural freedom, as they can be used on sloping surfaces and come in 5 standard colours:

- **Copper Art®**
- **Silver Art®**
- Light Grey RAL 7047
- Basalt Grey RAL 7012
- Pale green RAL 6021



Lightweight

Made of polyvinyl chloride, PVC membranes are flexible even at low temperatures. Lightweight and very strong, they are easy to use and apply.



Simplicity

PVC membranes offer numerous possibilities for colour and finish. Eg.: **Flagon® Walkway** membrane or triangular raised profiles. They are simple to install, but highly effective.



How to choose synth

To meet the most diverse requirements and the most demanding specifications, **SOPREMA** and **FLAG** have developed the system that perfectly meets your needs.

Whether exposed or not, whether the substrate is concrete or masonry, choose the PVC waterproofing solution best suited to your type of installation.

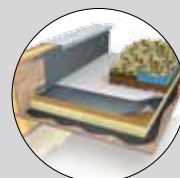
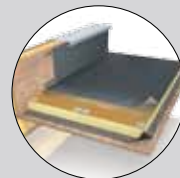
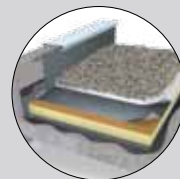
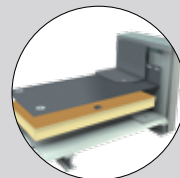


WATERPROOFING ON INSULATION

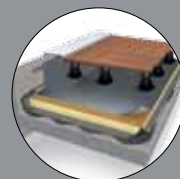


INTENDED USE

Non-trafficable



Trafficable



ROOFING



Non-trafficable



ROOFING DETAILS
> pages 22-23

WATERPROOFING DETAILS
> pages 24-25

WELDING INSTRUCTIONS
> pages 26-27

thetic waterproofing

have put together a complete range of membranes and systems to give you the possibility of choosing
ctly meets your needs.

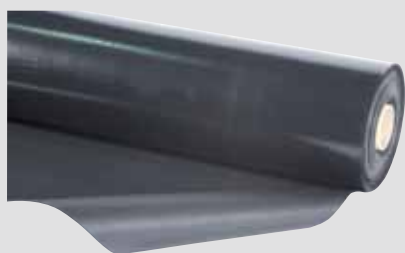
concrete or wood, whether the roof is trafficable or not,
allation taking account of its characteristics and the objectives sought.

PROTECTION	SUBSTRATE	SYSTEM	PAGES
Apparent waterproofing	STEEL DECK	MECHANICALLY FASTENED	6-7
Gravel	CONCRETE	LOOSE LAID	8-9
Apparent waterproofing	CONCRETE	BONDED APPLICATION	10-11
	WOOD	BONDED APPLICATION	12-13
Sopranature® (green roofing)	CONCRETE	LOOSE LAID	14-15
	WOOD	LOOSE LAID	16-17
Paving slabs on support pads	CONCRETE	LOOSE LAID	18-19
Copper Art® Silver Art® (apparent membrane)	WOOD	BONDED APPLICATION	20-21
<div> INSPECTION AND FINISHING INSTRUCTIONS > page 28-29 </div> <div> FULL ADHERENCE > pages 30-31 </div> <div> PRODUCT RECAP TABLE > pages 32-33 </div>			



APPARENT NON-TRAFFICABLE PVC WATERPROOFING

TIPS



- If **Flagon® SRF** is used on EPS, cork or bitumen-surfaced insulation panel, **Flagon® SR** membrane would be used for transverse overlapping within a minimum width of 12 cm.
- Possibility to use **Flagon® SR** + a separating layer instead of **Flagon® SRF**.
- A slope up or equal to 3% is required.
- See treatment of details on pages 22-23.
- In technical areas, provide a walkway. In this case, opt for the **Flagon® Walkway** membrane.
- **Efigreen Alu**, may be replaced by mineral wool according to fire safety regulations.
- Use **Flexocol V** adhesive, for upstands > 40 cm high.

WATERPROOFING

On the main surface, **Flagon® SR** or **SRF** membranes, are semi-loose laid by mechanical fastening, and always laid to run a few centimetres on the parapet.
They are fastened around the perimeter of the roof and around any protruding features with **Flagorail** bars or adapted screws and plates.
At the top of the upstands, **Flagon® SR** is heat welded on **Flagmetal strip** mechanically fastened onto the substrate.

NORMATIVE REFERENCES

- D.T.U. 43.3/NF P 84-206*
- "Avis Technique" **Flagon® SR****
- CPP **Flagon®** PVC flat roofs***

* Building code for flat roof waterproofing on steel deck

** Technical guideline approved by a supervisor

*** Technical approval from CSTB

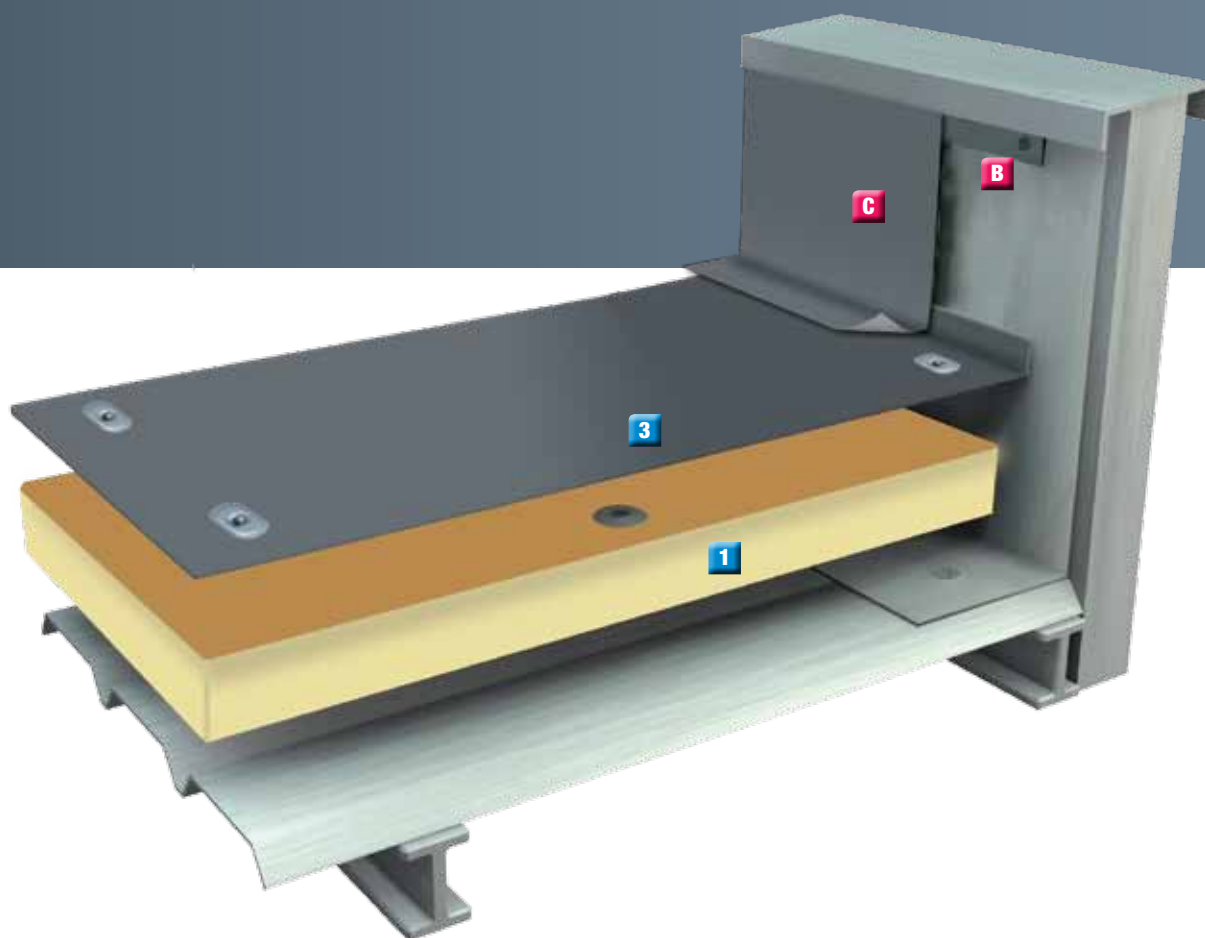
STANDARD COLOURS



Light Grey
RAL 7047



Basalt Grey
RAL 7012



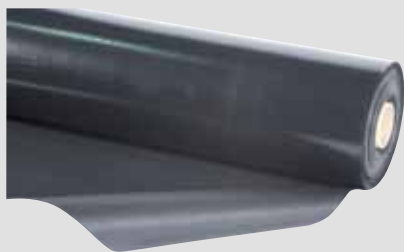
	PRODUCT	COVERAGE	PACKAGING	DETAILS	QUANTITY
MAIN SURFACE	1 EFGREEN ALU INSULATION	main surface +5 %	depending on thickness (panels 60 cm x 60 cm)	$\lambda = 0.024 \text{ w/m.K}$	..... panels
	3 FLAGON® SR	main surface +3 %	rolls 20 m x 1.60 m	thickness 15/10	..... m ²
UPSTAND	B FLAGMETAL STRIP	upstand length	10 units x 2 m (20 m)		..... units
	C FLAGON® SR*	length x (height + heel)	rolls 20 m x 1.60 m		..... m ²

*15/10 thickness instead of 12/10 as recommended in the technical roof classification.



NON-TRAFFICABLE PVC WATERPROOFING UNDER BALLAST

TIPS



- **Flagon® SFc** is used on EPS, cork or bitumen-surfaced insulation panel, **Flagon® SV** membrane is used for transverse overlapping within a minimum width of 12 cm.
- Possibility to use **Flagon® SV** + a separating layer instead of **Flagon® SFc**.
- See treatment of details on pages 22-23.
- A slope of 2% is enough, in use, to avoid reverse slopes, depressions and stagnating water.
- For gravel ballast, the anti-puncturing screen is not necessary if the gravel is pea gravel with a particle size of 5/25 (the larger fragments must not exceed 2/3 of the thickness of the ballasting layer). The ballast must be laid as the job progresses as the waterproofing is completely loose laid. Otherwise, intermediate ballasting will be required.
- Use **Flexocol V** adhesive, for upstands > 40 cm high.

WATERPROOFING

On the main surface, **Flagon® SFc** membranes are completely loose laid and must always run a few centimetres on the parapet. They are fastened around the perimeter of the roof and around any protruding features with **Flagorail** bars.

At the top of the upstands, **Flagon® SV** is heat welded on **Flagmetal strip** mechanically fastened onto the substrate.

VARIANT WITHOUT INSULATION



NORMATIVE REFERENCES

- D.T.U. 20.12/NF P 10-203*
- D.T.U. 43.1/NF P 84-204**
- CPP **Flagon®** PVC flat roofs***
- "Avis Technique" **Flagon® SV******

* Building code for flat roof intended to receive waterproofing

** Building code for flat roof waterproofing on concrete

*** Technical guideline approved by a supervisor

**** Technical approval from CSTB

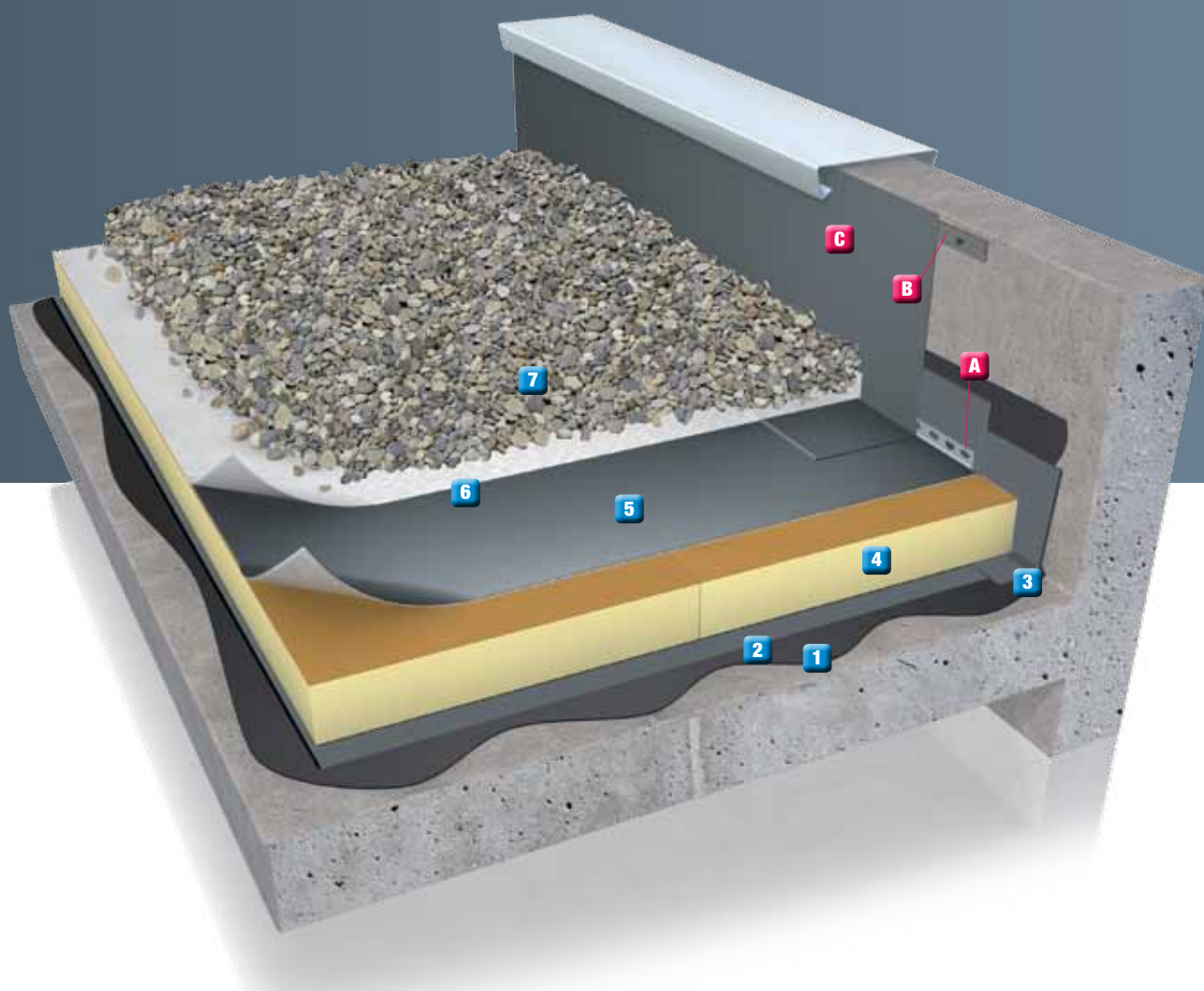
STANDARD COLOURS



Light Grey
RAL 7047



Basalt Grey
RAL 7012

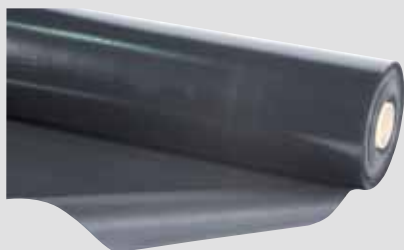


	PRODUCT	COVERAGE	PACKAGING	DETAILS	QUANTITY
MAIN SURFACE	1 AQUADERE®	main surface +10%	cans 5 L or 25 L	250 g/m ²	..... kg
	2 ELASTOPHENE® 25	main surface +10%	rolls 10 m x 1 m	thickness 2.5 mm	
	3 CORNER REINFORCEMENT SOPRALENE®	main surface +10%	rolls 10 m x 0.25 m	thickness 3.5 mm	
	4 EFIGREEN DUO INSULATION	main surface +5 %	depending on thickness (panels 60 cm x 60 cm)	$\lambda = 0.024$ w/m.K	..... panels
	5 FLAGON® SFc	main surface +10 %	rolls 20 m x 1.60 m	thickness 15/10	..... m ²
	6 FLAG GEOTEXTILE 300	main surface +10 %	rolls 100 m x 2 m (200 m ²)	300 g/m ²	..... m ²
	7 GRAVEL	4 cm thick x surface			
UPSTAND	A FLAGORAIL	upstand length	10 units x 3 m (30 m)		..... units
	B FLAGMETAL STRIP	upstand length	10 units x 2 m (20 m)		..... units
	C FLAGON® SV	length x (height + heel)	rolls 20 m x 1.60 m		..... m ²



APPARENT NON-TRAFFICABLE PVC WATERPROOFING

TIPS



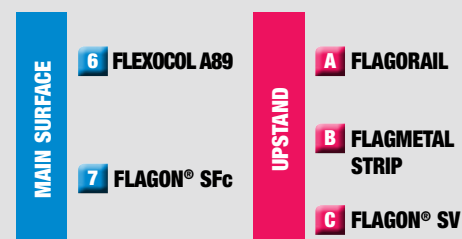
- **Flagon® SFc** is used on an adapted insulation panel, **Flagon® SV** membrane is used for transverse overlapping within a minimum width of 12 cm.
- See treatment of details on pages 22-23.
- A slope of 2% is enough, in use, to avoid reverse slopes, depressions and stagnating water.
- In technical areas, provide a walkway. In this case, opt for the **Flagon® Walkway** membrane. It is essential to take particular care when laying the insulation and to constantly press down the membrane after adhering it.
- Use **Flexocol A89** adhesive, a single-component, slightly expansive polyurethane-based product. The adhesive must be spread over all the surface using a rubber squeegee, in one layer.
- It is recommended to use **Flagon® liquid PVC** implementation using an oil can to reinforce joints.
- Triangular raised profiles can be used to finish the roof. These are attractive and modern and give regular joints.
- Use **Flexocol V** adhesive, for upstands > 40 cm high.

WATERPROOFING

On the main surface, the **Flagon® SFc** membranes are bonded with glue and must always run a few centimetres on the parapet. They are fastened around the perimeter of the roof and around any protruding features with **Flagorail** bars.

At the top of the upstands, **Flagon® SV** is heat welded on **Flagmetal strip** mechanically fastened onto the substrate.

VARIANT WITHOUT INSULATION



NORMATIVE REFERENCES

- D.T.U. 20.12/NF P 10-203*
- D.T.U. 43.1/NF P 84-204**
- CPP **Flagon®** PVC flat roofs***

* Building code for flat roof intended to receive waterproofing

** Building code for flat roof waterproofing on concrete

*** Technical guideline approved by a supervisor

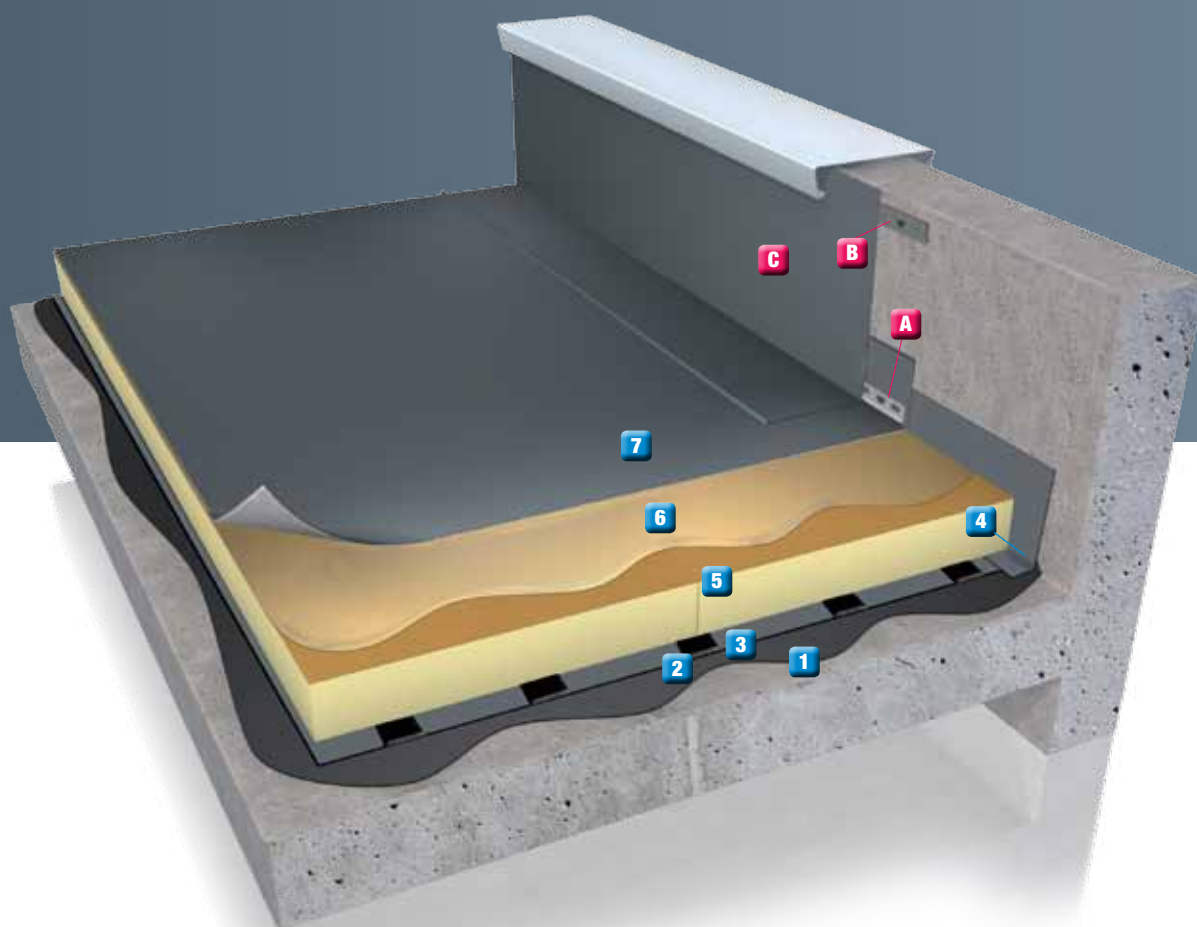
STANDARD COLOURS



Light Grey
RAL 7047



Basalt Grey
RAL 7012



	PRODUCT	COVERAGE	PACKAGING	DETAILS	QUANTITY
MAIN SURFACE	1 AQUADERE®	main surface +10%	cans 5 L or 25 L	250 g/m ²	..... kg
	2 ELASTOPHENE® 25	main surface +10%	rolls 10 m x 1 m	thickness 2.5 mm	..... kg
	3 COLTACK	main surface +10%	can 25 kg	300 g/m ²	..... kg
	4 CORNER REINFORCEMENT SOPRALENE®	main surface +10%	rolls 10 m x 0.25 m	thickness 3.5 mm	..... kg
	5 EFIGREEN ALU INSULATION	main surface +5 %	depending on thickness (panels 60 cm x 60 cm)	$\lambda = 0.024$ w/m.K	..... panels
	6 FLEXOCOL A89	main surface +10%	10 L can	400 g/m ²	..... units
	7 FLAGON® SFc	main surface +10 %	rolls 20 m x 1.60 m (30 m ² effective)	thickness 15/10	..... m ²
UPSTANDS	A FLAGORAIL	upstand length	10 units x 3 m (30 m)		..... units
	B FLAGMETAL STRIP	upstand length	10 units x 2 m (20 m)		..... units
	C FLAGON® SV	length x (height + heel)	rolls 20 m x 1.60 m (30 m ² effective)		..... m ²



APPARENT NON-TRAFFICABLE PVC WATERPROOFING

TIPS



- **Flagon® SFc** is used on an adapted insulation panel, **Flagon® SV** membrane is used for transverse overlapping within a minimum width of 12 cm.
- See treatment of details on pages 22-23.
- A slope of 2% is enough, in use, to avoid reverse slopes, depressions and stagnating water.
- In technical areas, provide a walkway. In this case, opt for the **Flagon® Walkway** membrane. It is essential to take particular care when laying the insulation and to constantly press down the membrane after adhering it.
- Use **Flexocol A89** adhesive, a single-component, slightly expansive polyurethane-based product. The adhesive must be spread over all the surface using a rubber squeegee, in one layer.
- It is recommended to use **Flagon® liquid PVC** implementation using an oil can to reinforce joints
- Triangular raised profiles can be used to finish the roof. These are attractive and modern and give regular joints.
- Use **Flexocol V** adhesive, for upstands > 40 cm high.

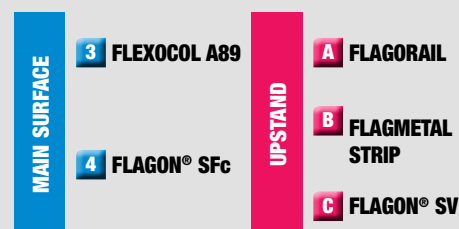
WATERPROOFING

On the main surface, the **Flagon® SFc** membranes are bonded with glue and always run a few centimetres on the parapet.

They are fastened around the perimeter of the roof and around any protruding features with **Flagorail** bars.

At the top of the upstands, **Flagon® SV** is heat welded on **Flagmetal strip** mechanically fastened onto the substrate.

VARIANT WITHOUT INSULATION



NORMATIVE REFERENCES

- D.T.U. 43.4/NF P 84-207*
- CPP **Flagon®** PVC flat roofs**

*Building code for flat roof waterproofing on wood

**Technical guideline approved by a supervisor

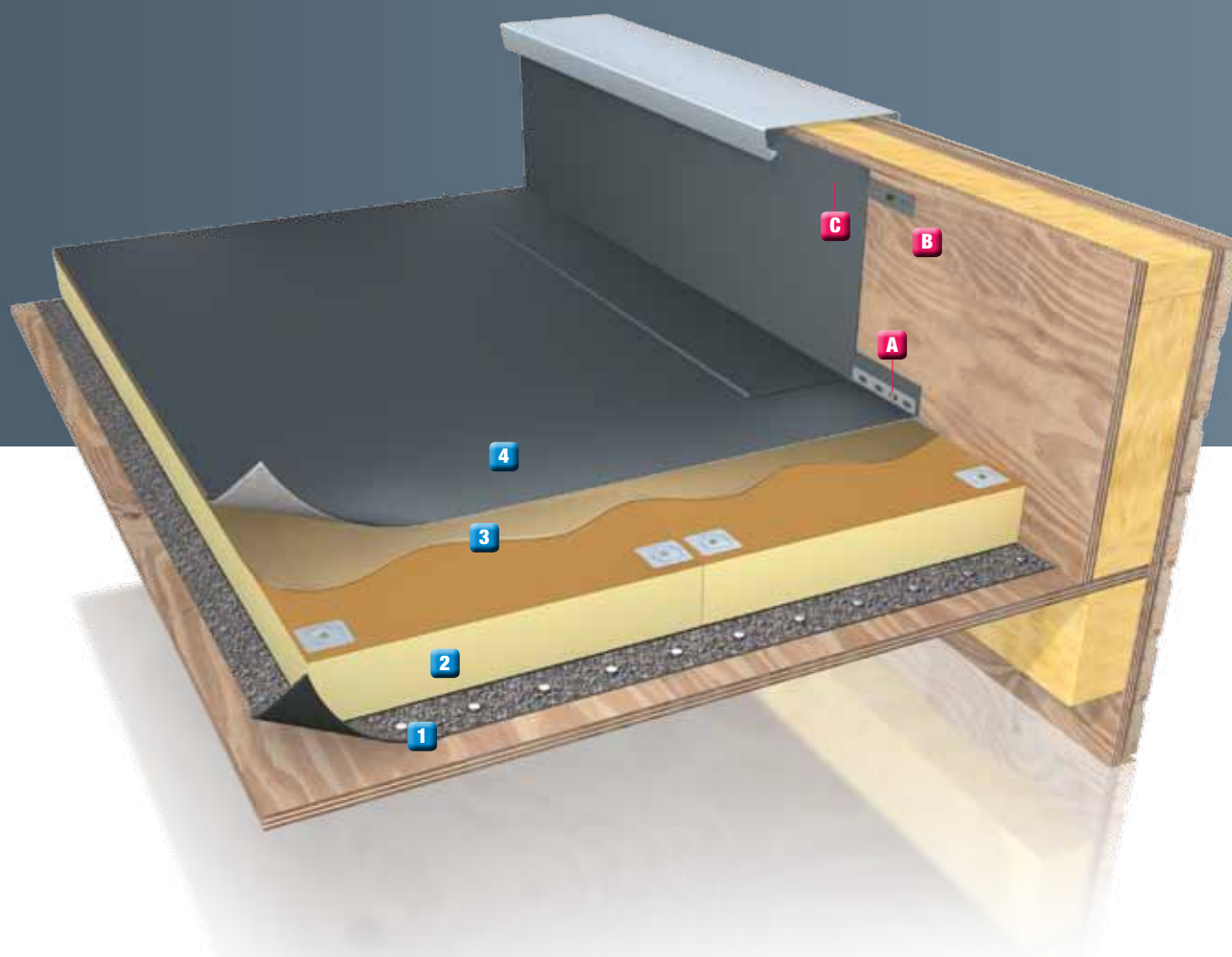
STANDARD COLOURS



Light Grey
RAL 7047



Basalt Grey
RAL 7012



	PRODUCT	COVERAGE	PACKAGING	DETAILS	QUANTITY
MAIN SURFACE	1 ELASTOPHENE® 25	main surface +10 %	rolls 10 m x 1 m	thickness 2.5 mm	..... m ²
	2 EFIGREEN ALU INSULATION	main surface +5 %	depending on thickness (panels 60 cm x 60 cm)	$\lambda = 0.024 \text{ w/m.K}$	..... panels
	3 FLEXOCOL A89	main surface +10 %	10 L can	400 g/m ²	..... units
	4 FLAGON® SFC	main surface +10 %	rolls 20 m x 1.60 m (30 m ² effective)	thickness 15/10	..... m ²
UPSTAND	A FLAGORAIL	upstand length	10 units x 3m (30 m)		..... units
	B FLAGMETAL STRIP	upstand length	10 units x 2 m (20 m)		..... units
	C FLAGON® SV	length x (height + heel)	rolls 20 m x 1.60 m (30 m ² effective)		..... m ²



NON-TRAFFICABLE PVC WATERPROOFING UNDER GREEN ROOFING

TIPS

- If **Flagon® SFc** is used on an adapted insulation panel, **Flagon® SV** membrane would be used for transverse overlapping within a minimum width of 12 cm.
- Possibility to use **Flagon® SV** + a separating layer instead of **Flagon® SFc**.
- See treatment of details on pages 22-23.
- A slope of 2% is enough, in use, to avoid reverse slopes, depressions and stagnating water.
- Use **Flexocol V adhesive**, for upstands > 40 cm high.

WATERPROOFING

On the main surface, the **Flagon® SFc** or **SV** membranes are completely loose laid and must always run a few centimetres on the parapet. They are fastened around the perimeter of the roof and around any protruding features with **Flagorail** bars.

At the top of the upstands, **Flagon® SV** is heat welded on **Flagmetal strip** mechanically fastened onto the substrate.

VARIANT WITHOUT INSULATION

MAIN SURFACE

- | | |
|------------------------------|--------------------------|
| 5 FLAGON® SFc | A FLAGORAIL |
| 6 FLAG GEOTEXTILE 300 | B FLAGMETAL STRIP |
| 7 TOUNDRA'BOX | C FLAGON® SV |

UPSTAND

SOPRANATURE® ADVANTAGES



- **Sopranature®** has many advantages over the traditional garden roof: not too thick, reduced load, possibility to make a slope, limited maintenance and watering.
- Each project is subject of a study which determines best technical and economic solutions depending on the constraints specific to the building: climate, slope, admissible load...
- Green roofs also offer interesting advantages concerning soundproofing and rainwater retention.

NORMATIVE REFERENCES

- D.T.U. 20.12/NF P 10-203*
- D.T.U. 43.1/NF P 84-204**
- CPP **Flagon®** PVC flat roofs***
- CPP **Sopranature®** (slope ≤ 20%)***

* Building code for flat roof intended to receive waterproofing

** Building code for flat roof waterproofing on concrete

*** Technical guideline approved by a supervisor

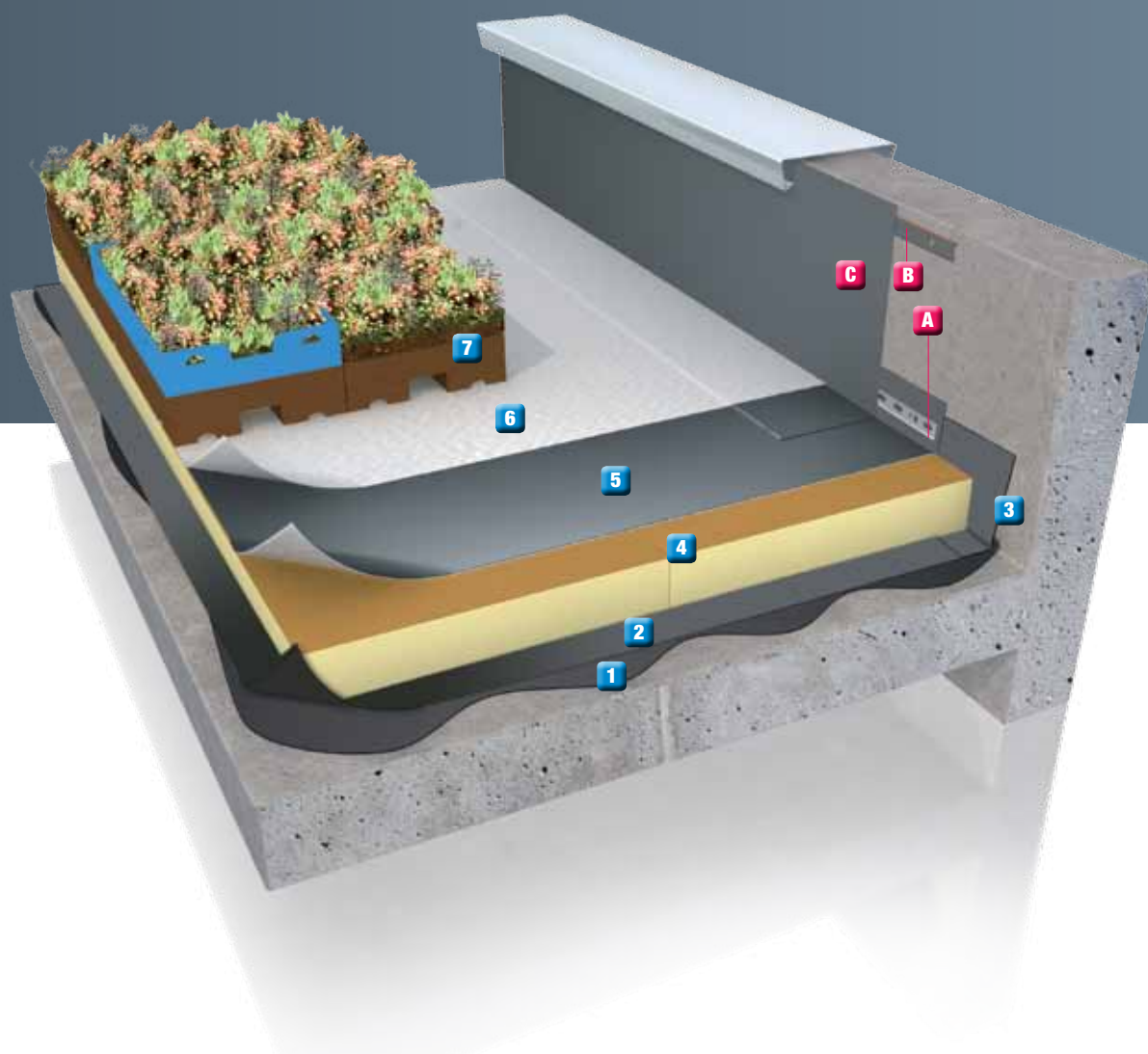
STANDARD COLOURS



Light Grey
RAL 7047



Basalt Grey
RAL 7012



	PRODUCT	COVERAGE	PACKAGING	DETAILS	QUANTITY
MAIN SURFACE	1 AQUADERE®	main surface +10%	cans 5 L or 25 L	250 g/m ²	..... kg
	2 ELASTOPHENE® 25	main surface +10%	rolls 10 m x 1 m	thickness 2.5 mm	
	3 CORNER REINFORCEMENT SOPRALENE®	main surface +10%	rolls 10 m x 0.25 m	thickness 3.5 mm	
	4 EFIGREEN DUO INSULATION	main surface +5 %	depending on thickness (panels 60 cm x 60 cm)	$\lambda = 0.024$ w/m.K	..... panels
	5 FLAGON® SFc	main surface +10 %	rolls 20 m x 1.60 m (30 m ² effective)	thickness 15/10	..... m ²
	6 FLAG GEOTEXTILE 300	main surface +10 %	rolls 100 m x 2 m (200 m ²)	300 g/m ²	..... m ²
	7 TOUNDRA'BOX	main surface	box	30 cm x 60 cm	..... units
UPSTANDS	A FLAGORAIL	upstand length	10 units x 3 m (30 m)		..... units
	B FLAGMETAL STRIP	upstand length	10 units x 2 m (20 m)		..... units
	C FLAGON® SV	length x (height + heel)	rolls 20 m x 1.60 m (30 m ² effective)		..... m ²



NON-TRAFFICABLE PVC WATERPROOFING UNDER GREEN ROOFING

TIPS

- If **Flagon® SFc** is used on an adapted insulation panel, **Flagon® SV** membrane would be used for transverse overlapping within a minimum width of 12 cm.
- Possibility to use **Flagon® SV** + a separating layer instead of **Flagon® SFc**.
- See treatment of details on pages 22-23.
- A slope of 2% is enough, in use, to avoid reverse slopes, depressions and stagnating water.
- Use **Flexocol V** adhesive, for upstands > 40 cm high.

SOPRANATURE® ADVANTAGES



- **Sopranature®** has many advantages over the traditional garden roof: not too thick, reduced load, possibility to make a slope, limited maintenance and watering.
- Each project is subject of a study which determines best technical and economic solutions depending on the constraints specific to the building: climate, slope, admissible load. . .
- Green roofs also offer interesting advantages concerning soundproofing and rainwater retention.

WATERPROOFING

On the main surface, the **Flagon® SFc** or **SV** membranes are completely loose laid and must always run a few centimetres on the parapet. They are fastened around the perimeter of the roof and around any protruding features with **Flagorail** bars.

At the top of the upstands, **Flagon® SV** is heat welded on **Flagmetal strip** mechanically fastened onto the substrate.

VARIANT WITHOUT INSULATION



NORMATIVE REFERENCES

- D.T.U. 43.4/NF P 84-207*
- CPP **Flagon®** PVC flat roofs**
- CPP **Sopranature®** (slope ≤ 20%)**

* Building code for flat roof waterproofing on wood

** Technical guideline approved by a supervisor

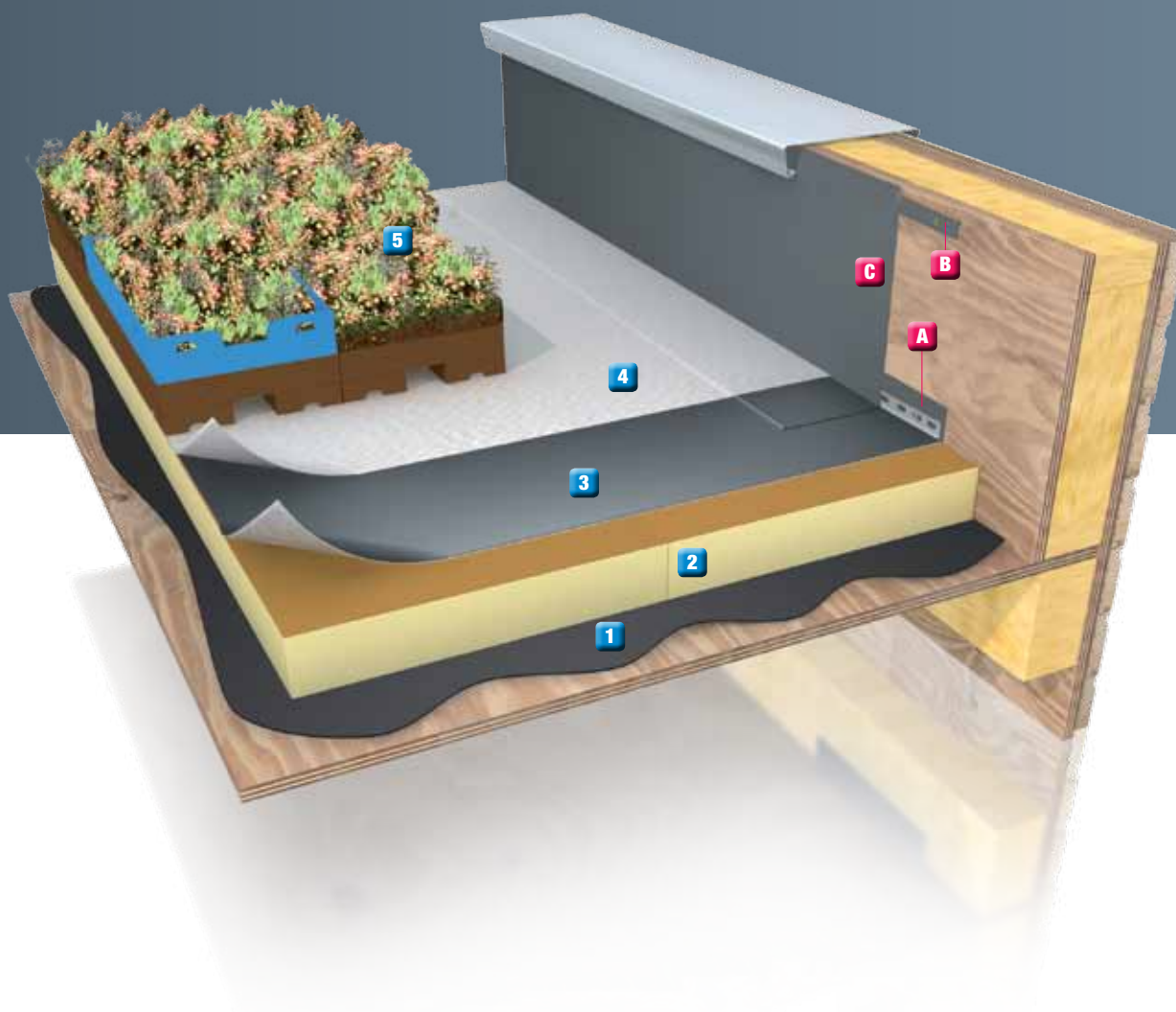
STANDARD COLOURS



Light Grey
RAL 7047



Basalt Grey
RAL 7012

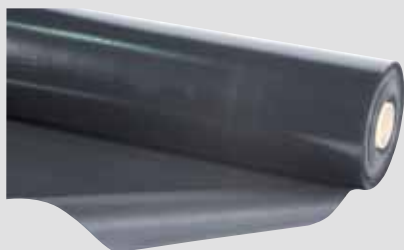


	PRODUCTS	COVERAGE	PACKAGING	DETAILS	QUANTITY
MAIN SURFACE	1 AQUADERE®	main surface +10 %	cans 5 L or 25 L	250 g/m²	..... kg
	2 EFIGREEN DUO INSULATION	main surface +5 %	depending on thickness (panels 60 cm x 60 cm)	$\lambda = 0.024 \text{ w/m.K}$	..... panels
	3 FLAGON® SFC	main surface +10 %	rolls 20 m x 1.60 m (30 m² effective)	thickness 15/10	..... m²
	4 FLAG GEOTEXTILE 300	main surface +10 %	rolls 100 m x 2 m (200 m²)	300 g/m²	..... m²
	5 TOUNDRA'BOX	main surface	box	30 cm x 60 cm	..... units
UPSTANDS	A FLAGORAIL	upstand length	10 units x 3 m (30 m)		..... units
	B FLAGMETAL STRIP	upstand length	10 units x 2 m (20 m)		..... units
	C FLAGON® SV	length x (height + heel)	rolls 20 m x 1.60 m (30 m² effective)		..... m²



TRAFFICABLE PVC WATERPROOFING UNDER PAVING SLABS ON SUPPORT PADS

TIPS



- If **Flagon® SFc** is used on an adapted insulation panel, **Flagon® SV** membrane would be used for transverse overlapping within a minimum width of 12 cm.
- Possibility to use **Flagon® SV** + a separating layer instead of **Flagon® SFc**.
- See treatment of details on pages 22-23.
- A slope of 2% is enough, in use, to avoid reverse slopes, depressions and stagnating water.
- Use **Flexocol V** adhesive, for upstands > 40 cm high.

WATERPROOFING

On the main surface, the **Flagon® SFc** or **SV** membranes are completely loose laid and must always run a few centimetres on the parapet. They are fastened around the perimeter of the roof and around any protruding features with **Flagorail** bars.

At the top of the upstands, **Flagon® SV** is heat welded on **Flagmetal strip** mechanically fastened onto the substrate.

VARIANT WITHOUT INSULATION



NORMATIVE REFERENCES

- D.T.U. 20.12/NF P 10-203*
- D.T.U. 43.1/NF P 84-204**
- CPP **Flagon®** PVC flat roofs***

* Building code for flat roof intended to receive waterproofing

**Building code for flat roof waterproofing on concrete

***Technical guideline approved by a supervisor

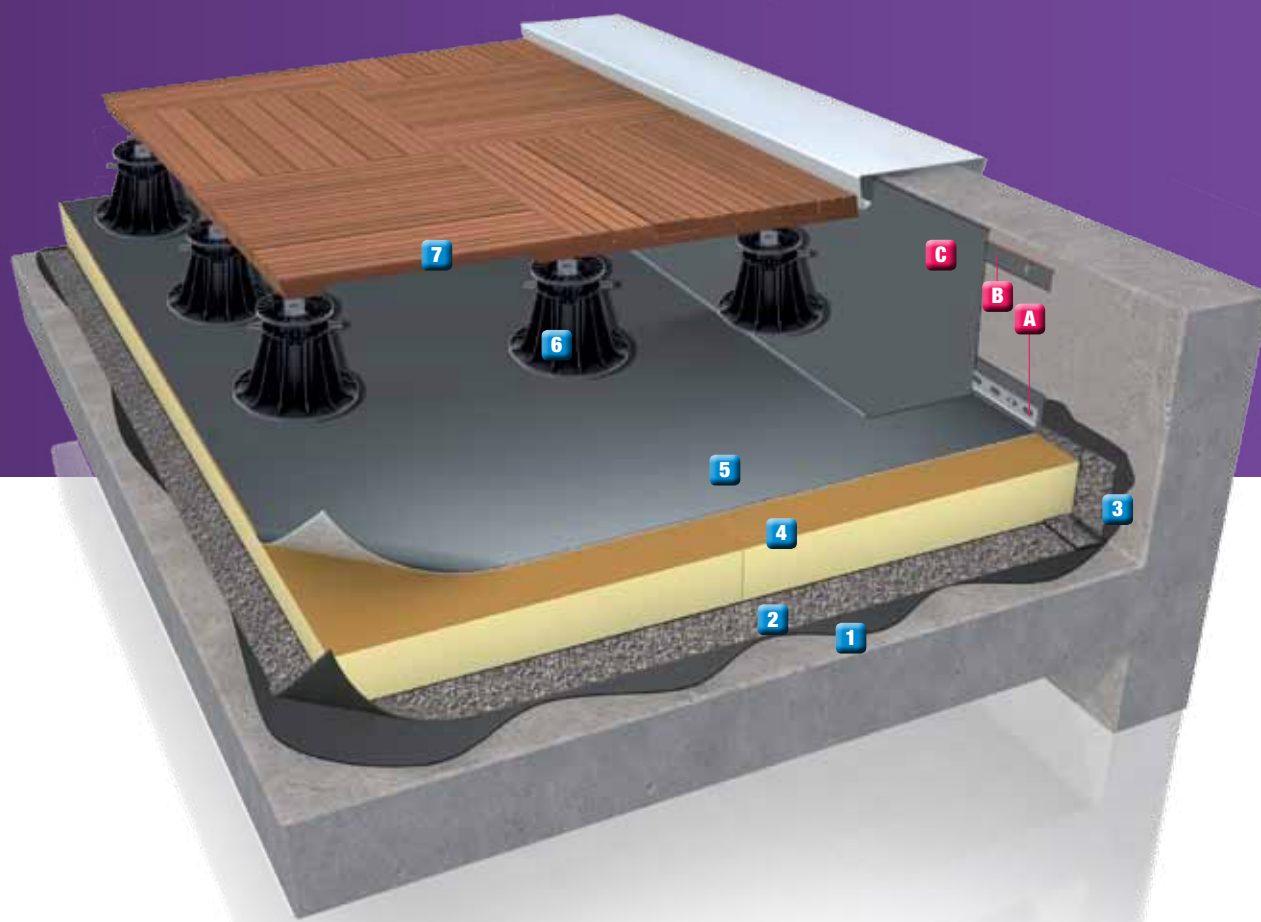
STANDARD COLOURS



Light Grey
RAL 7047



Basalt Grey
RAL 7012



	PRODUCT	COVERAGE	PACKAGING	DETAILS	QUANTITY
MAIN SURFACE	1 AQUADERE®	main surface +10%	cans 5 L or 25 L	250 g/m ²	..... kg
	2 ELASTOPHENE® 25	main surface +10%	rolls 10 m x 1 m	thickness 2.5 mm	
	3 CORNER REINFORCEMENT SOPRALENE®	main surface +10%	rolls 10 m x 0.25 m	thickness 3.5 mm	
	4 EFIGREEN DUO INSULATION	main surface +5 %	depending on thickness (panels 60 cm x 60 cm)	$\lambda = 0.024$ w/m.K	..... panels
	5 FLAGON® SFc	main surface +10 %	rolls 20 m x 1.60 m (30 m ² effective)	thickness 15/10	..... m ²
	6 SUPPORT PADS	5 Pedestals/m ² with 50 cm x 50 cm tiles	box of 100	fixed paving support pads 8 mm	..... units
			box of 60	fixed paving support pads 35 mm	..... units
			box of 20	adjustable paving support pads 40 to 67 mm	..... units
			box of 60	adjustable paving support pads 60 to 90 mm	..... units
			box of 60	adjustable paving support pads 90 to 150 mm	..... units
			box of 48	adjustable paving support pads 150 to 260 mm	..... units
	7 PRESTIDALLE	4 tiles/m ²	4 tiles	50 cm x 50 cm	..... units
UPSTANDS	A FLAGORAIL	upstand length	10 units x 3 m (30 m)		..... units
	B FLAGMETAL STRIP	upstand length	10 units x 2 m (20 m)		..... units
	C FLAGON® SV	length x (height + heel)	rolls 20 m x 1.60 m (30 m ² effective)		..... m ²



NON-TRAFFICABLE ROOFING WITH APPARENT MEMBRANE

This patented roofing system can be used to apply all synthetic membranes whatever the degree or length of the roof slope, including on complex and original roofs. This innovative membrane is easy to install in any circumstances, and perfectly renders the appearance of a traditional copper or zinc roof.

TIPS



- If **Flagon® Copper Art® / Silver Art® SFc** is used on an adapted insulation panel, **Flagon® Copper Art® / Silver Art® SV** membrane would be used for transverse overlapping within a minimum width of 12 cm.
- Possibility to use **Flagon® Copper Art® / Silver Art® SR** + a separating layer instead of **Flagon® Copper Art® / Silver Art® SRc** mechanically fastened.
- A slope of 2% is enough, in use, to avoid reverse slopes, depressions and stagnating water.
- It is essential to take particular care when laying the insulation and to constantly press down the membrane after adhering it.
- Use **Flexocol A89** adhesive, a single-component, slightly expansive polyurethane-based product. The adhesive must be spread over all the surface using a rubber squeegee, in one layer.
- It is recommended to use **Flagon® liquid PVC** implementation using a special dispenser to reinforce joints.
- Triangular raised profiles can be used to finish the roof. These are attractive and modern and give regular joints.

NORMATIVE REFERENCES

- D.T.U. 43.4/NF P 84-207
- CPP **Copper Art®/Silver Art®**

* Building code for flat roof waterproofing on wood

**Technical guideline approved by a supervisor

POSSIBLE COLOURS

Metallic membranes:



Copper Art®



Silver Art®

Other colours:



**Light Grey
RAL 7047**



**Basalt Grey
RAL 7012**



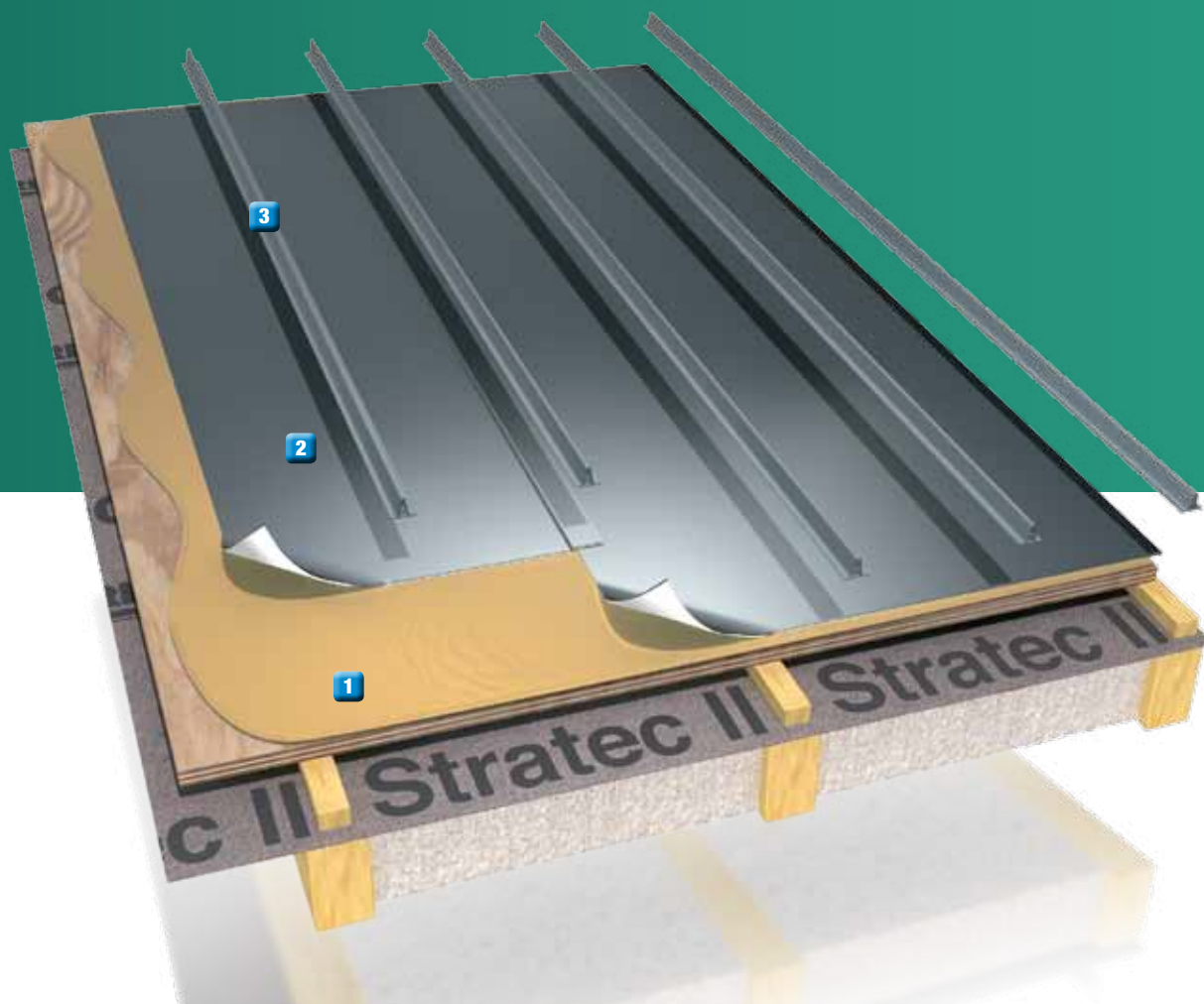
**Pale green
RAL 6021**

COPPER
art

SILVER
art

Copper Art®/ Silver Art® ADVANTAGES

- Perfection and beauty of a metal surfaced roof guaranteed to last.
- Extended cope for use: reduction of the minimum admissible slope, elimination of separating screen with **Flagon® SFc**.

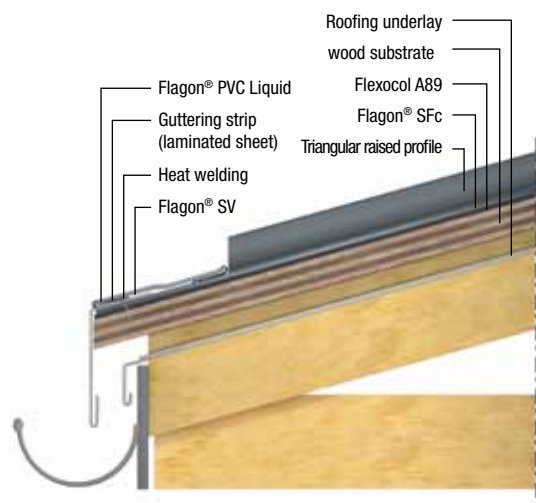


	PRODUCT	COVERAGE	PACKAGING	DETAILS	QUANTITY
MAIN SURFACE	1 FLEXOCOL A89	main surface +10 %	10 L can	400 g/m ²	..... units
	2 FLAGON® SFC COPPER ART® OR SILVER ART®	main surface +10 %	rolls 20 m x 1.60 m (30 m ² effective)	thickness 18/10	..... m ²
	3 TRIANGULAR RAISED PROFILES COPPER ART® OR SILVER ART®	depending on distance required	10 units x 4 m (40 m)		..... units



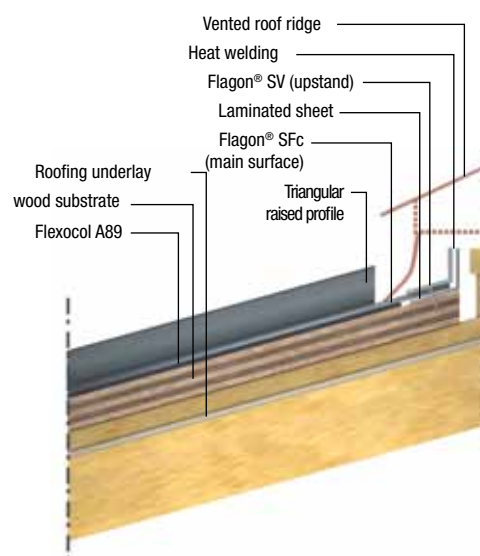
Roofing details

■ GUTTERING



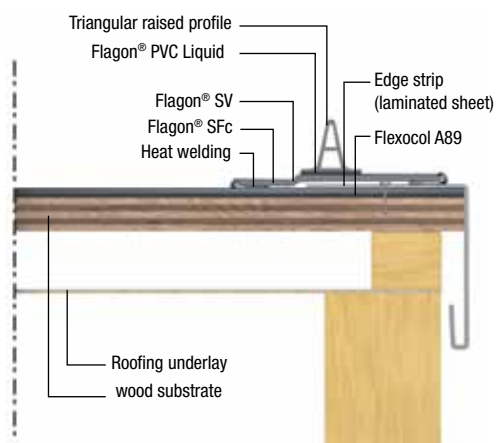
- **Perpendicular installation:** Bridging with a **Flagon® SV** membrane welded on the main surface to the **Flagon® SFC** membrane and the laminated gutter strip.
- **Parallel installation:** The 5 cm non-felted strip on the underside of the **Flagon® SFC**, is welded directly onto the gutter strip made of laminated sheet

■ RIDGE



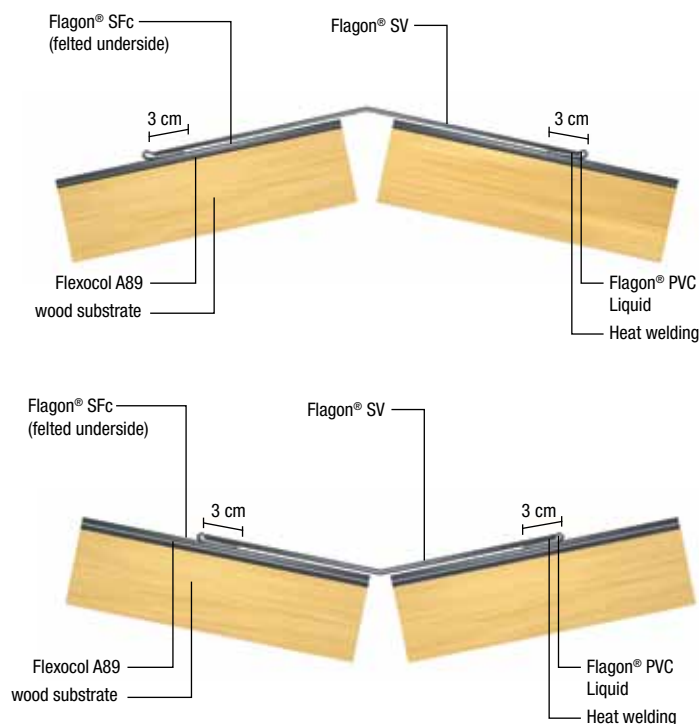
- **Vented roof ridge**
- **Non-vented roof ridge:** The strips of **Flagon® SFC** membrane, fully adhered to each slope, are covered by a strip of **Flagon® SV** welded on either side, continuously along the length of the ridge.

■ ROOF EDGE



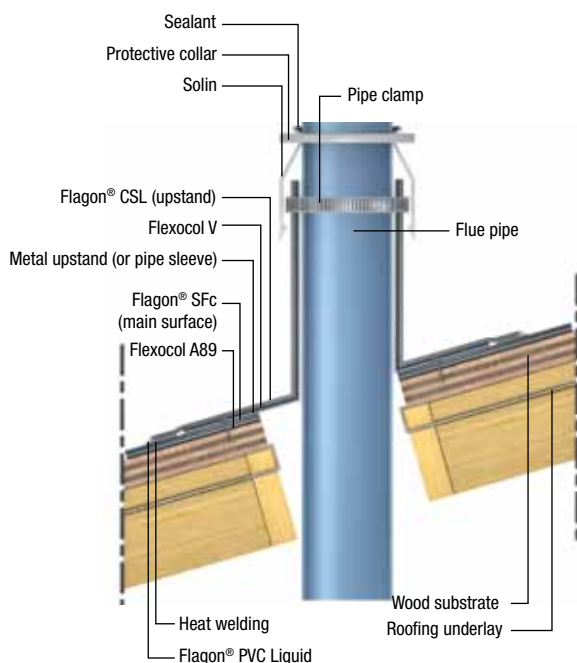
Bridging with a **Flagon® SV** membrane welded on the main surface to the **Flagon® SFC** membrane and the gutter strip made of laminated sheet.

■ HIP OR VALLEY



The strips of **Flagon® SFC** membrane, fully adhered to each slope, are covered by a strip of **Flagon® SV** welded on either side, continuously along the whole height of the slope.

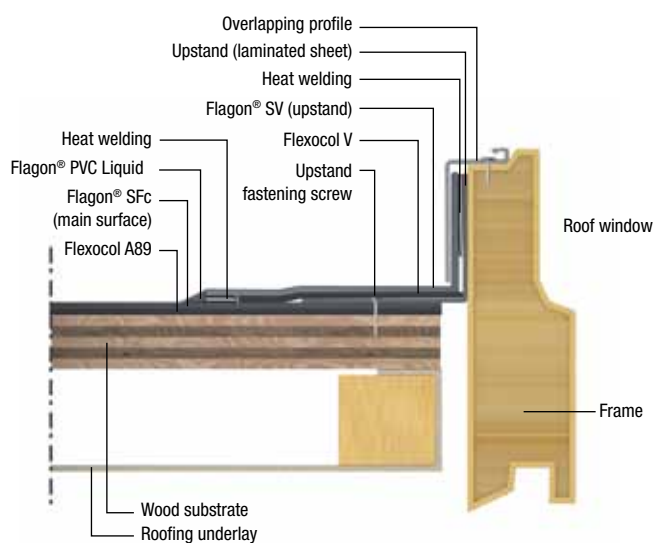
■ FLUE PIPES (VENTILATION, CHIMNEYS, ...)



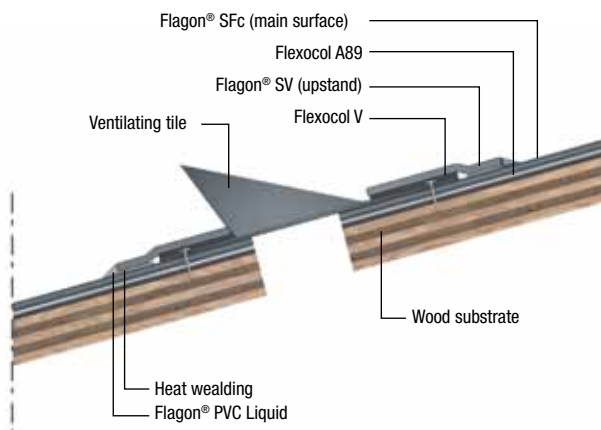
Flue pipes are dealt with by covering a metal upstand or pipe sleeve with flexible **Flagon® CSL** membrane, adhered with **Flexocol V** and mechanically fastened at the top (pipe clamp or welding onto a laminated sheet part).

■ ROOF WINDOW

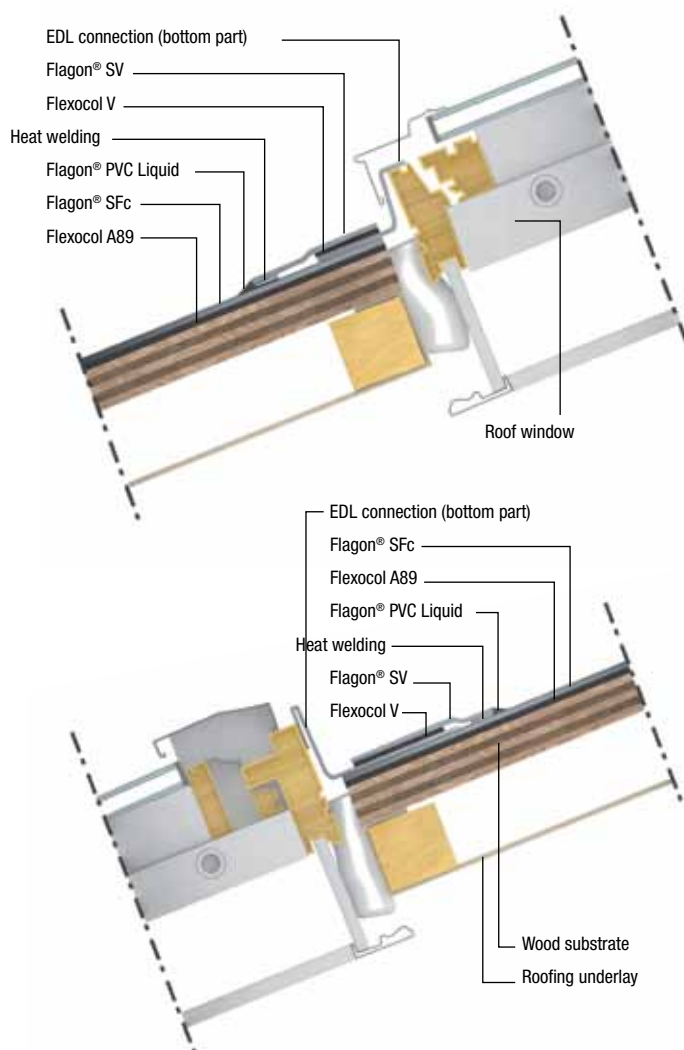
Conventional roof windows are generally only installed in roofs with slope of 27% (see window manufacturer's recommendations). For smaller slopes, only systems specifically designed for flat roofs may be used.



■ VENTILATING TILE



The metal ventilating tile is mechanically fixed to the substrate and covered with 2 pieces of **Flagon® SV** membrane adhered with **Flexocol V** to the base of the ventilating tile and welded around the edge to the **Flagon® SFc** membrane on the main surface. Metal ventilating tiles which are a different colour to the roofing surface may be covered with **Flagon® CSL** membrane, adhered with **Flexocol V**.



Waterproofing details

HOW TO DEAL WITH UPSTANDS

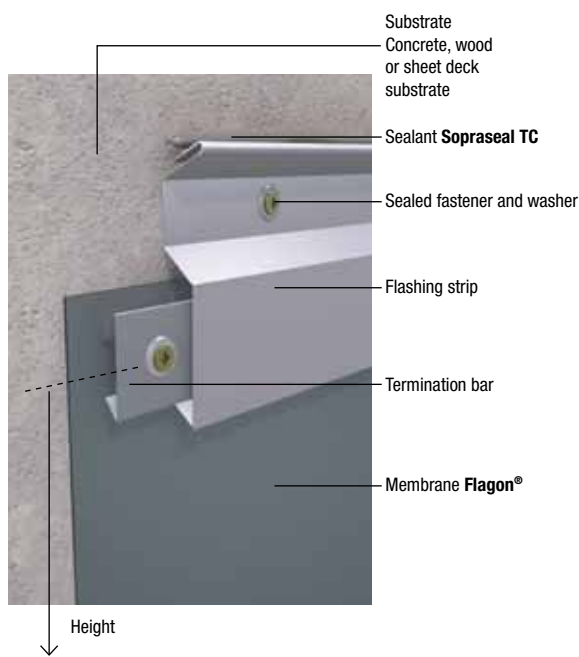
The nature of the substrate and its appearance may require the use of a membrane with a felted underside or the use of an adjusting or separating layer (**FLAG Geotextile 300**).

Upstands cover the main surface with a heel of at least 10 cm, welded over 3 cm when hot air welding is used.

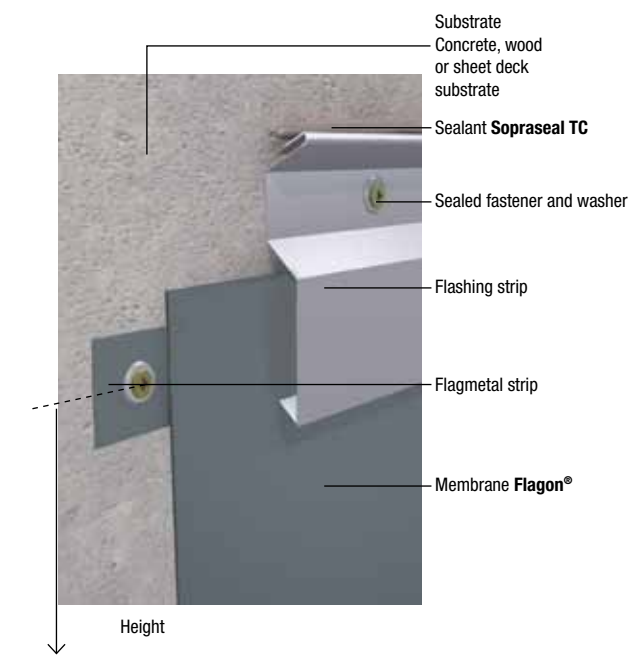
■ TECHNIQUES FOR APPLYING UPSTANDS

The upstand is mechanically fixed at the top by a fastening bar with 4 fasteners/m.

■ Example with a termination bar



■ Example with a flagmetal strip



Particular measures for upstands with a height > 40 cm

The mechanical fastening at the top is completed by full adhering using **Flexocol V** contact adhesive or by intermediate mechanical fastening.

■ UPSTAND CORNERS

> With pre-formed corner

For finishing purposes, we generally use special pre-formed pieces made of the same material as the membrane.



> Without pre-formed corner

For internal corners, the **Flagon®** membrane can be simply folded, cut and welded as a sealed pocket into the corner. This method is used for membranes manufactured in a choice of RAL colours.

The steps in the process are as follows:



ROOF PENETRATIONS (VENTILATION, POSTS, CABLE GLANDS, ...)

Roof penetrations are dealt with by covering the area with a **Flagon® CSL** flexible, homogenous but non-reinforced membrane of the same composition and with a minimum thickness of 15/10^{ths}.

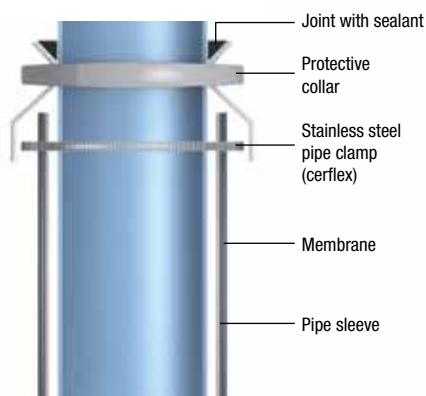
This prefabricated solution can be accompanied by contact adhering with **Flexocol V** - and is always completed by mechanical fastening at the top either by clamping or welding onto a laminated sheet part.

It is indispensable to include a device for carrying away runoff water at the top of each structure.

The parts to be covered (pipe sleeve or posts, ...) will always comply with series of relevant DTU.



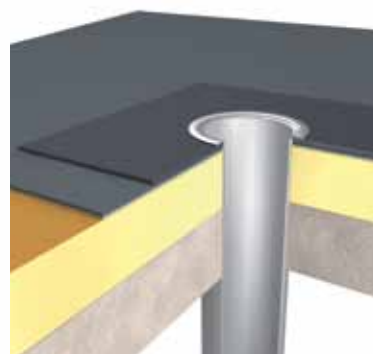
■ Example of how to cover a roof penetration (with pipe sleeve)



■ Example of how to cover a gooseneck on site



■ In the case of a felted membrane, Depco FLAG is welded onto the waterproofing.



Welding instructions

PREPARATION

■ BEFORE WELDING

After laying the membranes in accordance with the previous instructions for the roof concerned, you must mechanically fix the membranes around the perimeter.

They are always raised a few centimetres on any projections and are fastened around the perimeter of the roof and any protruding features using either:

- **Flagorail** (recommended solution)
- Occasional fastening with a pre-drilled bar 82 x 40
- Continuous welding onto a fixed laminate sheet profile
- Clamping with a laminated sheet or other profile.



WELDING

■ MANUAL HOT AIR WELDING

The membrane is welded by passing the hot air nozzle between the edges to be assembled and advancing slowly.

Manual welding is done in two phases: spot welding (fusible spots) at the back of the overlap then welding along the edge of the overlap.

The effective weld width is at least 30 mm.

The welding temperature range should be adapted to the material and the outdoor weather conditions by a process of testing each time hot air welding work is begun.



■ WELDING THE MEMBRANES

Flagon® PVC membranes are easy to weld.

Today the three most common techniques in use are:

- manual hot air welding
- automatic hot air or wedge welding
- THF solvent welding

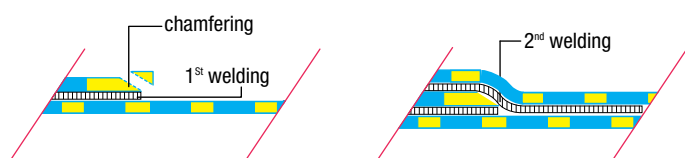
These three techniques are not independent of each other; on the contrary, they can be used simultaneously depending on the particular circumstances and requirements of each job.

> It is essential that the strips of membrane to be welded are clean and dry.

■ MULTIPLE STRIP JOINTS

All the sharp edges at the ends of the strips of membranes must be rounded off using a Stanley knife or scissors.

- If there are more than two layers of membrane superposed, it is necessary to chamfer the edge.
- If the ends of the sheets form cross joints with 4 edges, as well as the chamfer, it will be necessary to apply an circular piece of membrane over the weld point for greater security.



"T-joint"

■ MAINS POWER SUPPLY

A sufficiently powerful site electrical box (220 Volts) must be provided for the exclusive use of the waterproofing contractor, so as to guarantee a constant and sufficient power supply suitable for the equipment used on the site.

The current required is ≥ 30 amps with a minimum power ≥ 10 kilowatts (for 2 manuals welding sets + 1 Varimat).

It is generally recommended:

- to use electric cables with a cross section $\geq 2.5 \text{ mm}^2$, and for cables over 50 m long, to use sections $\geq 4 \text{ mm}^2$.
- to limit the use of an electric cable to one workstation.

Inspection & finishing instructions

■ INSPECTION OF SURFACES LAID (visual inspection)

It is possible to check all the membrane laid because of the difference in colour (light/dark) between the upper and undersides of virtually all **Flagon®** membranes.

This means that if membranes are accidentally torn or damaged by abrasions during the work on site, the damage will be visible to the naked eye thanks to this signal colour.

As a result, it is easy to repair the hole by welding over it a piece of the same type of **Flagon®** membrane.

■ MECHANICAL INSPECTION

(for all automatic or manual hot air and THF solvent welds)

This inspection consists of passing a rounded tool called a welding Tester along the weld whilst applying just enough pressure to detect any weak points or zones with insufficient adherence.

This operation, which is absolutely necessary to check the integrity of the welding, must be done when cold (with THF after 12-24 hrs). If spots with irregularities or insufficient adherence are found, these defects are noted, then repaired by welding a piece of the same membrane over them.

These checks must be done by a qualified heat welder accredited to lay **Flagon®** membrane systems.



■ WELD FINISHING

This is obligatory for solvent welds as well as on T-joints for all types of welds.

It is done using **Flagon® liquid PVC** paste.

A bead of paste is placed along the joint between the membranes using a special dispenser. The **Flagon®** paste must be applied as the work progresses immediately after inspection on a clean, dry membrane (consumption 10 to 15 grammes per metre of weld).

Confirming weld quality is obligatory for all work

- on zero slopes in accordance with the Quality Assurance Plan
- on roof gardens
- with THF welded PVC membranes.



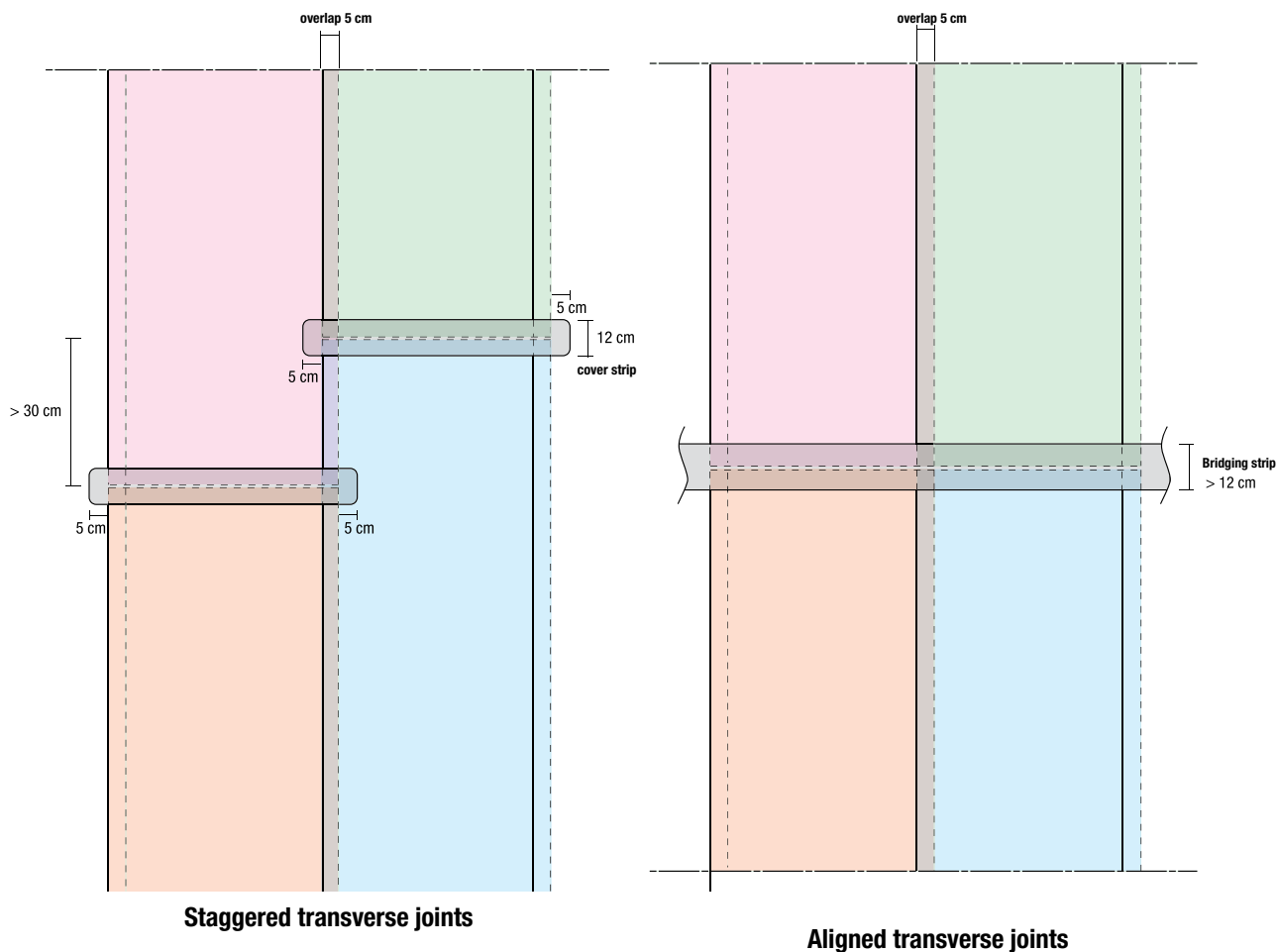
MEMBRANES FULLY BONDED WITH ADHESIVE

■ POSITIONING OF THE STRIPS

The membranes are unrolled and positioned on the substrate (fixed or adhered insulation or the substrate directly) and are folded back lengthways.



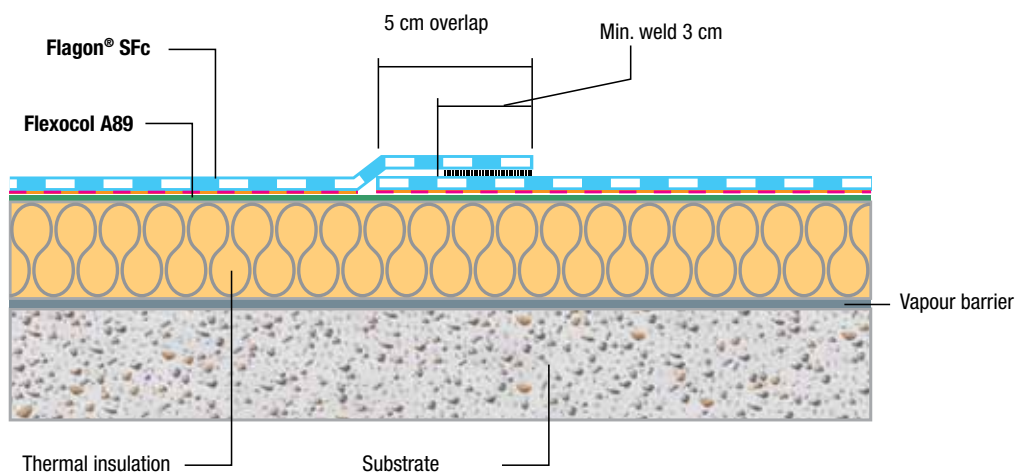
There are 2 possibilities for the transverse overlapping:



Full adherence

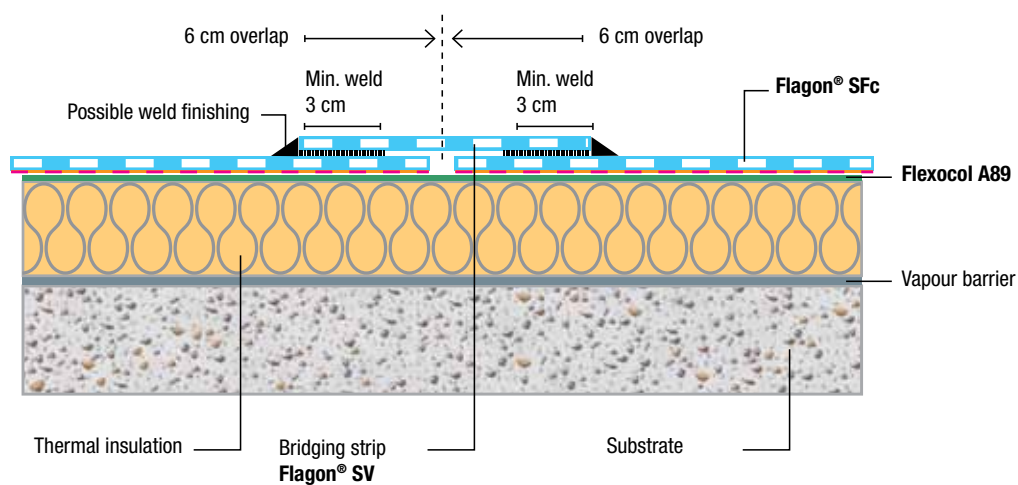
■ LONGITUDINAL OVERLAPPING

This is defined by the membrane without a felt underside.



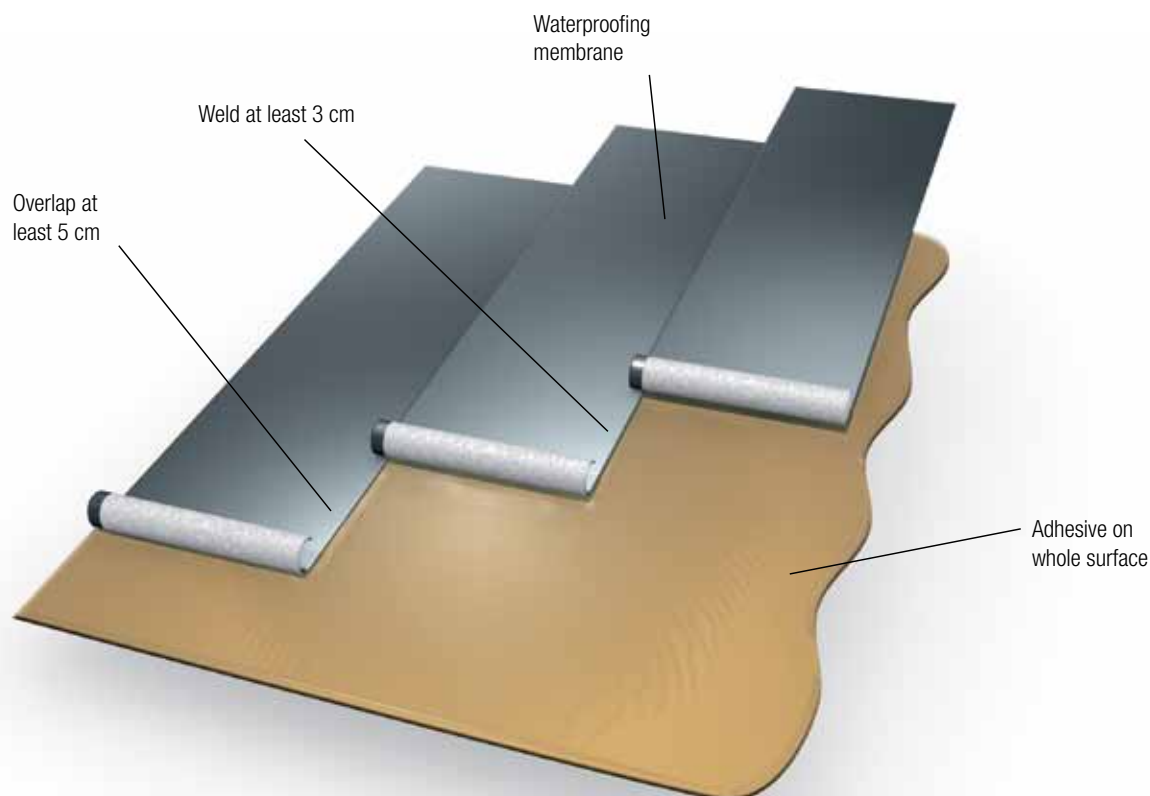
■ TRANSVERSE OVERLAPPING

This is done simply by butting the ends "head-to-head". The seams are then made by bridging with a strip of **Flagon® SV** at least 12 cm wide welded on either side.



■ FULLY ADHERED MEMBRANES

It is essential to keep in mind the importance of the quality of the installation of the vapour barrier on the substrate. Indeed, the vapour barrier/insulation complex, with the membrane (Flagon® SFc) laid fully adhered contributes to the bonding of the overall structure.



We use **Flexocol A89** adhesive, a single-component, slightly expansive polyurethane-based product. The adhesive is spread over all the surface using a rubber squeegee, in one layer.

The **Flagon® SFc** sheet must be laid within 30 minutes of applying the adhesive and carefully pressed down. Hardening begins 2 hours after application, and maximum adhesion will be reached after 24 to 48 hours.

The consumption of **Flexocol A89** adhesive will be of the order of 300 to 400 g/m² on average depending on the nature of the substrate.

The adhesive must be protected against frost and brought to ambient temperature before use (you may need to heat it up in a "bain marie").



This type of installation requires the application with a squeegee or roller to the whole surface of **Flexocol A89** polyurethane-base adhesive.

Product recap table

PRODUCT	DETAILS	COMMERCIAL CODE	PACKAGING	WEIGHT
PVC MEMBRANES FOR MAIN SURFACES				
FLAGON® SFC 12/10	Light Grey RAL 7047	21241	Roll 20 x 1.60 m (32 m²)	1,70 kg / m²
	Basalt Grey RAL 7012	21242		
FLAGON® SFC 15/10	Light Grey RAL 7047	21243	Roll 20 x 1,60 m (32 m²)	2,00 kg / m²
	Basalt Grey RAL 7012	21244		
FLAGON® SFC 18/10	Light Grey RAL 7047	21245	Roll 20 x 1,60 m (32 m²)	2,35 kg / m²
	Basalt Grey RAL 7012	21246		
	Copper Art®	21701		
	Silver Art®	21704		
PVC MEMBRANES FOR UPSTANDS				
FLAGON® SV 12/10	Light Grey RAL 7047	21001	Roll 20 x 1,60 m (32 m²)	1,50 kg / m²
	Basalt Grey RAL 7012	21002		
FLAGON® SV 15/10	Light Grey RAL 7047	21003	Roll 20 x 1,60 m (32 m²)	1,80 kg / m²
	Basalt Grey RAL 7012	21004		
	Copper Art®	21703		
	Silver Art®	21706		
FLAGON® SV 18/10	Light Grey RAL 7047	21005	Roll 20 x 1,60 m (32 m²)	2,15 kg / m²
	Basalt Grey RAL 7012	21006		
FLEXIBLE PVC MEMBRANES FOR DETAILS				
FLAGON® CSL	Light Grey RAL 7047	21735	Roll 20 x 2,10 m (42 m²)	1,95 kg / m²
	Basalt Grey RAL 7012	21736		
	Copper Art®	21725	Roll 5 x 1,50 m (7,50 m²)	1,95 kg / m²
	Silver Art®	21724		
PVC MEMBRANE FOR WALKWAYS				
FLAGON® WALKWAY PVC	Basalt Grey RAL 7012	21611	Roll 20 x 1,50 m (30 m²)	2,15 kg / m²
	other colours: on request only			
SLIP AND/OR SEPARATION LAYERS				
FLAG GEOTEXTILE PET 300	300 g/m²	21541	Roll 100 x 2 m (200 m²)	0,30 kg / m²
FLAG GEOTEXTILE PP 300	300 g/m²	21546	Roll 100 x 2 m (200 m²)	0,30 kg / m²
ADHESIVES				
FLEXOCOL A89	Adhesive for main surfaces Flagon® SFC	21533	10 litre can	12,00 kg / can
FLEXOCOL V	Contact adhesive for upstands	21539	10 litre can	12,00 kg / can
PERIPHERAL FASTENINGS				
FLAGORAIL 3 M	3 m bar	21640	Packet of 10 x 3 m (30 m)	12,00 kg / Packet
JUNCTION PIECE FOR FLAGORAIL		21641	Packet of 50	0,30 kg / Packet
TRIANGULAR RAISED PROFILES				
TRIANGULAR RAISED PROFILE 4 M	Light Grey RAL 7047	21440	Box of 10 units x 4 m (40 m)	
	Basalt Grey RAL 7012	21442		0,40 kg / m
	Pale green RAL 6021	21441		1,60 kg / unit
	Copper Art®	21722		16,00 kg / box
	Silver Art®	21723		

PRODUCT	DETAILS	COMMERCIAL CODE	PACKAGING	WEIGHT
---------	---------	-----------------	-----------	--------

PROFILES AND LAMINATED SHEETS

LAMINATED SHEETS	Light Grey RAL 7047	21426	Sheet 2 x 1 m (2 m ²)	
	Basalt Grey RAL 7012	21427		6,50 kg / m ²
	Copper Art®	21720		13,00 kg / sheet
	Silver Art®	21718		
LAMINATED SHEET 2 M WORKED 5 CM	Light Grey RAL 7047	21410	Packet of 10 x 2 m (20 m)	6,50 kg / Packet
	Basalt Grey RAL 7012	21411		

CORNERS

INTERNAL CORNERS 90° HEIGHT 95 MM	Light Grey RAL 7047	21314	Box of 20	2,10 kg / box
	Basalt Grey RAL 7012	21315		
	Copper Art®	21711		
	Silver Art®	21713		
EXTERNAL CORNERS 90° HEIGHT 95 MM	Light Grey RAL 7047	21306	Box of 20	2,10 kg / box
	Basalt Grey RAL 7012	21307		
	Copper Art®	21712		
	Silver Art®	21710		

WELD CHECKING – CLEANER

PVC LIQUID	Light Grey RAL 7047	21514	3 litre can	3,00 kg / can
	Basalt Grey RAL 7012	21518		
	Copper Art®	21716		
	Silver Art®	21717		
PVC LIQUID DISPENSER		21531	unit	
THF SOLVENT		21590	3 litre can	3,00 kg / can
PVC CLEANER		21512	3 litre can	3,00 kg / can

RAINWATER EVACUATION

RECTANGULAR SIDE OUTLETS 100 X 100 MM - LENGTH 50 CM	Light Grey RAL 7047	21400	Box of 10 units	11,80 kg / box
	Basalt Grey RAL 7012	21401		
FLAG DEPCO STRAIGHT PVC Ø 63	Basalt Grey RAL 7012	22200	unit	0,90 kg / units
FLAG DEPCO STRAIGHT PVC Ø 85	Basalt Grey RAL 7012	22202	unit	1,30 kg / units
FLAG DEPCO STRAIGHT PVC Ø 95	Basalt Grey RAL 7012	22204	unit	1,30 kg / units
FLAG DEPCO STRAIGHT PVC Ø 120	Basalt Grey RAL 7012	22208	unit	1,50 kg / units
FLAG DEPCO STRAIGHT PVC Ø 145	Basalt Grey RAL 7012	22210	unit	1,70 kg / units

TOOLS

HOT AIR WELDING KIT INCLUDING: Triac S 1500 W + 4 nozzles + 2 rollers + brush + spare resistance		21650	Carry case	
CHAMFER KNIFE		21528	unit	
WELDING TESTER	Weld inspection	21603	unit	
PAIR OF SPECIAL FLAG SCISSORS		21526	unit	
FLEXOCOL A89 SQUEEGEE		21579	unit	



SOPREMA at your service

Looking for a sales contact in order to discuss a future project or a project that is under way?

Any questions about the implementation of our product range?

SOPREMA Export Department

Tel.: + 33 (0)3 88 79 84 84

E-mail: export@soprema.com

More information on www.soprema.com



A project under way
We have solutions!
www.soprema.com
Tel. +33 3 88 79 84 84

SOPREMA

GROUP

14 rue de Saint-Nazaire - CS 60121
67025 STRASBOURG Cedex - France

Tel: 03 88 79 84 00 - Fax: 03 88 79 84 01

E-mail: contact@soprema.com - www.soprema.com

SOPREMA products are CE marked according to Construction Products Directive 89/106/EEC (CPD), approved European Standards and ETAG guidelines. SOPREMA SAS with a Capital of 50 000 000 € - Headquarter: 14 rue de Saint-Nazaire - 67100 STRASBOURG - FRANCE Postal address: CS 60121 - 67025 STRASBOURG CEDEX. RCS STRASBOURG: 314 527 557 Due to the continuous evolution of the SOPREMA product range, please consult our Technical Data Sheets for exact and up to date specific technical information. SOPREMA reserves the right to modify the composition and conditions of use of its materials and their price without warning, depending on developments in know-how and technology. Orders will be accepted only on the conditions and according to the specifications in force on the date when the order is received.