

# Sintofoil

YOUR PARTNER FOR ADVANCED ENVIRONMENTALLY FRIENDLY WATERPROOFING SOLUTIONS

The TPO/FPA (Thermoplastic Polyolefin / Flexible Polypropylene Alloy) Sintofoil membrane is produced by extrusion of granules resulting from the incorporation of Ethylene Propylene Rubber into a Polypropylene matrix together with other additives as appropriate to the type of membrane. Sintofoil combines the features of EPDM (high physical properties, outstanding weathering, absence of volatile and toxic component) and PVC (weldability, aesthetics) while offering significant advantages.



# Sintofoil TPO/FPA membranes

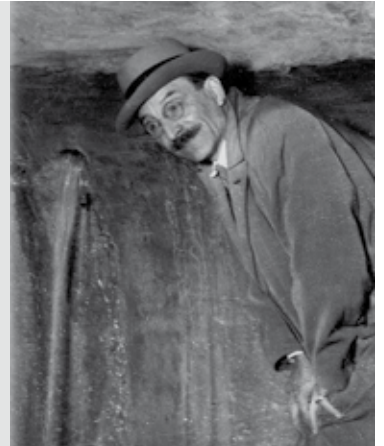
*With over 60 years of experience, Imper Italia has reached a high level of knowledge and skill in roofing and waterproofing technology. The production of bitumen/ polymer membranes, a field where Imper Italia gained leadership, has helped the research and the development of synthetic materials, including technopolymers (advanced polymers).*

## IMPER ITALIA, A LEADING PIONEER

The latest polymerisation process enables the incorporation of uncured ethylene propylene rubber into a polypropylene matrix, resulting in Flexible Polypropylene Alloy, a flexible, totally inert technopolymer which offers the high performance of conventional elastomers while allowing heat welded field seam.

Constant research focused on developing the most appropriate systems to meet customers requirements while being fully environmentally friendly. This research has enabled the technicians at Imper Italia's Rubberfuse division to develop Sintofoil, a new generation of synthetic waterproofing membranes.

The first installations using a TPO/FPA membrane date back 1994. Today, over 10 million m<sup>2</sup> of Rubberfuse systems have been successfully installed in more than 40 countries, from freezing Siberia to hot Middle-East.



## ADVANTAGES OF SINTOFOIL

The elastomeric-thermoplastic polymer provides the Sintofoil membrane with specific properties which make it suitable for all types of waterproofing.

### **Easy field assembly**

The polyefin nature of Sintofoil allows for hot air seam welding of adjoining sheets.

### **High ageing resistance**

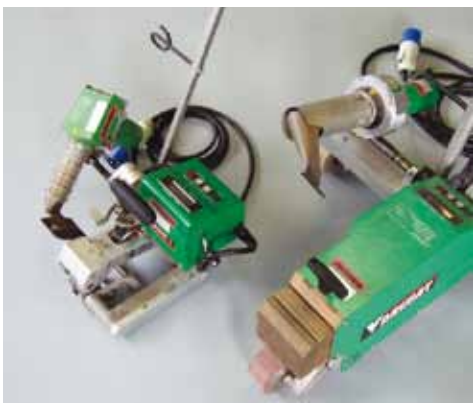
A chemically inert material with no plasticisers, Sintofoil remains intact over time.

### **Environment-friendly and totally recyclable**

Sintofoil's base polymer includes only carbon and hydrogen. There are no polluting elements such as chlorine, lead or other heavy metals.

### **Compatibility with bitumen and related products**

Elastomerised polyolefins as found in Sintofoil membranes have been used for years as part of Imper's polymerbitumen membranes compounds.



# Roofing



## **LOOSE LAID / BALLASTED SYSTEM** - Typical specification: Sintofoil ST or RG

A warm deck roof with the insulation installed loose-laid under the Sintofoil membrane, also loose-laid. The sheets are secured at perimeter and around penetrations. Min. 50 kg/m<sup>2</sup> ballast is required. Max. Slope: 10°.

- Insulation movement is not transmitted to the membrane.
- Most insulation types are compatible with the system.
- Outstanding resistance to external fire, especially with rockwool boards.
- No specific expansion joint required.
- Large sheets reduce installation time.



## **PROTECTED MEMBRANE SYSTEM** - Typical specification: Sintofoil ST or RG

A warm deck roof with closed cell insulation installed loose-laid above the Sintofoil membrane, also loose-laid. The sheets are secured at perimeter and around penetrations. Min. 50 kg/m<sup>2</sup> ballast is required. Max slope: 10°.

- Insulation movement is not transmitted to the membrane.
- Separate vapour control layer is not required.
- Insulation can be provided continuously across the roof and details.
- Good resistance to external fire.
- Additional protection from following trades or traffic in service not necessary.
- Large sheets reduce installation time.



## **MECHANICALLY ATTACHED SYSTEM** - Typical specification: Sintofoil ST or RG

A warm deck roof with compatible insulation installed under the Sintofoil membrane. The sheets are point fixed in overlaps, around the roof perimeter and penetrations. Wind uplift calculation is recommended.

- Lightweight system.
- Fast and easy installation.
- Excellent stability (< 0.5%) and wind uplift resistance.
- Resistance to external fire can be obtained with fire-rated sheets and boards.
- Corrosion resistance: rubberfuse fasteners exceed 15 Kesternich cycles.
- Coloured membrane provides improved aesthetics.
- Reinforced membrane available (dimensional stability < 0.1%).



## **ADHERED SYSTEM** - Typical specification: Sintofoil FB

A warm deck roof with the insulation installed under the Sintofoil membrane. The sheets are bonded to suitable insulation or existing system in case of reroofing and mechanically secured at the roof perimeter and around the penetrations.

- Lightweight system.
- Adapts to unusual roof configurations.
- Resistance to external fire can be obtained with FR type sheets and boards.
- Outstanding wind up lift resistance.
- Very convenient system for reroofing: no tear-off.
- Fleece-backed membrane allows for compatibility with most adhesive types.
- Coloured membrane provides improved aesthetics.

## **GREEN ROOF** - Typical specification: Sintofoil ST

A warm deck roof using either the loose-laid/ballasted or inverted roof concept. The sheets are secured at perimeter and around penetrations. The system also requires a specific design including drainage layer and growing medium as required to obtain a long lasting vegetation layer.

- Most environmentally friendly option for flat roof.
- Membrane is totally inert.
- EN 13948 (Grants a total resistance to roots).
- Outstanding resistance to external fire.
- Large sheets reduce installation time

## **COOL ROOF** - Typical specification: Sintofoil RG 1.8 Bianco Reflecta

For roofing which are required to reflect a high proportion of incident solar radiation and produce infrared heat energy at the same time. Such roofs absorb little heat, hence the name Cool Roof. They may provide an effective solution to the problem of summer overheating of individual buildings, as well as of urban areas, thereby mitigating the heat island effect.

- Sintofoil RG Bianco Reflecta has SRI = 102% SRI, reflectance R = 91% (Albedo) and emissivity E = 94%.
- Sintofoil RG Bianco Reflecta attributes several Credits to constructions subject to LEED criteria.
- Ideal for mechanically applied flat roofs.
- Version FB available on request for adhesive bonded applications.

## **FOUNDATIONS** - Typical specification: Sintofoil ST/WPS

For basement tanking, the Sintofoil membrane is usually loose-laid on the horizontal and fully adhered on the vertical. Mechanical protection is recommended prior to backfilling.

- Resistant to radon diffusion
- Exceptional resistance to puncture
- Very low water vapour transmission rate
- Resists to most soil contaminants
- Flexibility allows for easier installation
- Available in thickness up to 2.0 mm

## **WATER CONVEYANCE** - Typical specification: Sintofoil ST/WP

An ideal material for canals and ponds, the Sintofoil membrane can be simply loose-laid on the substrate and secured at the perimeter (trench or mechanically fixed profile). A protective layer (geotextile) may be required, according to specific conditions.

- Resistant to root penetration.
- Elongates when subject to out of plan stress.
- Outstanding UV resistance: membrane can be left exposed.
- Highest surface friction allows for steeper side slopes.
- Exceptional resistance to puncture.
- Lighter sheet means easier handling.
- Specific water contact properties make the ST/DW membrane suitable for applications such as potable water reservoirs and fish hatcheries.
- Potable water approval from DVGW, WRC and NSF.



# Rubberfuse - engineered systems

## A MEMBRANE FOR EACH APPLICATION

The Sintofoil production program includes membranes for roofing (new and retrofit), waterproofing and lining, available in various types, for optimum performance:

- **Sintofoil ST** standard non-reinforced (\*)
- **Sintofoil FB** standard with a polyester fleece backing
- **Sintofoil RG** reinforced with glass fiber
- **Sintofoil RG Bianco Reflecta (SRI = 102%)** reinforced with glass fiber
- **Sintofoil RT** reinforced with polyestergrid
- **Sintofoil RC** composite glass fiberpolyester reinforcement

Each roofing membrane type is also produced in a FR (fire-rated) version. Standard colours are black and grey. Standard thicknesses are 1.2mm and 1.5mm. Other colours and thicknesses are available on special order.

For further information relating to the specific use of each membrane type, please contact your local distributor or Rubberfuse's Technical Services.

(\*) SINTOFOIL ST / WPS for foundations and SINTOFOIL ST/WP for water reservoirs.

## COMPLETE SYSTEMS CONCEPT

The Rubberfuse concept is to harness the strengths of the Sintofoil membrane and combine these with a full range of accessories specially developed to provide specifiers with a complete waterproofing system which can be tailored to suit most types of construction.

- sheet laminated metal for termination profiles and impact resistant walkways
- prefabricated items: corners, pipes, drains and decorative profiles
- adhesives for flashings and horizontal membrane/insulation application
- waterstop mastic and rubber sealant for mechanical terminations
- standard and «thermal shut» fasteners and plates
- cleaner
- pourable sealer for critical details
- coating for aesthetic purpose or antislip walkways

## QUALITY, FROM PRODUCTION THROUGH PROJECT COMPLETION

Sintofoil membranes are manufactured in compliance with ISO 9001 standards and CE marking requirements. They are subject to approval certificates as issued by EOTA and other Authorities such as BBA, BDA-Intron, CSI, CSTB, EMI, IGH, ITC, Qualiconsult, SKZ, UBAtc, ZAG, FM, LAPI, EELab Modena University, etc.

In order to maintain installation standards, the Rubberfuse systems are only applied by fully trained, certificated and monitored contractors.



# SINTOFOIL Technical characteristics

	Norm	Unit	UEAtc criteria	ST	FB	RG	RG Bianco Reflecta	RT	RC <sup>(6)</sup>
Standard thickness <sup>(1)</sup>	EN 1849-2	mm	±5%	1.2	1.2	1.2	1.5	1.2	1.2
Standard roll size	EN 1848-2	m	≥	2.10x25/1.50x30	2.10x25/1.50x30	2.10x25/1.50x30	2.10x25	2.10x25	2.10x25
Standard colour <sup>(2)</sup>	-	-	-	gray / black	gray / black	gray / black	bianco reflecta <sup>(3)</sup>	gray / black	gray / black
Weight per unit area	EN 1849-2	kg/m <sup>2</sup>	±10%	1.08	1.24 *	1.10	1.10	1.13	1.13
Tensile strength L/T	EN 12311-2	N/mm <sup>2</sup>	≥ 6.0	16/15	16/15	-	-	-	-
	EN 12311-2	N/50mm	≥ 450	-	-	600/550	600/550	1100/1100	1100/1100
Elongation at break L/T (membrane)	EN 12311-2	%	≥ 250	700/700	700/700	700/700	700/700	-	-
Elongation at break L/T (reinforcement)	EN 12311-2	%	≥ 2.0	-	-	3/3	3/3	25/25	25/25
Low temperature flexibility <sup>(4)</sup>	EN 495-5	°C	≤ -30	-40	-40	-40	-40	-40	-40
Dimensional stability	EN 1107-2	%	≤ 1	-0.5	-0.5	-0.1	-0.1	-0.5	-0.1
Nail tear resistance	EN 12310-1	N	≥ 150	330/240	450/400 *	390/290	390/290	500/500	500/500
Water vapour permeability	EN 1931	μ	±30%	90.000	90.000	50.000	50.000	50.000	50.000
Watertightness	EN 1928	kPa	≥ 10	60	60	60	60	60	60
Static indentation									
• on concrete	EN 12730	-	≥	L20	L20 *	L20	L20	L25	L25
• on EPS	EN 12730	-	≥	L15	L15 *	L15	L15	L20	L20
Resistance to impact	I2691-B	mm	≥	120	120 *	120	120	120	120
Welded seam resistance									
• shear resistance	EN 12317-2	N/50mm	outside welded seam	Pass	Pass	Pass	Pass	Pass	Pass
• average peel resistance	EN 12317-2	N/50mm	≥ 150	290	290	290	290	290	290
• minimum peel resistance	EN 12316-2	N/50mm	≥ 80	270	270	270	270	270	270
Hail resistance	EN 13583	m/s	-	> 26	> 26	> 26	> 26	> 26	> 26
Durability									
• UV resistance 2.500 hours	EN 495-5	Δ°C	≤ 10	Pass	Pass	Pass	Pass	Pass	Pass
• Heat ageing - tensile strength	EN 12311-2	Δ %	≤ 20	-5	-5	-5	-5	-5	-5
• Heat ageing - elongation at break	EN 12311-2	Δ %	≤ 20	-5	-5	-5	-5	-5	-5
Wind uplift resistance (MAST fixings)									
• wind load (rupture)	UEAtc	Pa	-	5.500	5.500	≥ 6.000	≥ 6.000	≥ 6.000	≥ 6.000
• permissible load per fixin	UEAtc	N	-	726	-	713	713	713	713
Reaction to fire	EN 13501-Part I	-	-	EClass	-	EClass	EClass	-	-
Fire rating (FR type)	EN 13501-5	-	-	B <sub>Roof</sub> T1 <sup>(5)</sup>	-	B <sub>Roof</sub> T2/T3/T4 <sup>(7)</sup>	B <sub>Roof</sub> T2/T3/T4 <sup>(7)</sup>	-	-
Root resistance	EN 13948	-	-	Pass	Pass	Pass	Pass	-	-
Resistance to micro-organisms	EN ISO 846	-	-	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2
Potable water contact (DW type)	BS 6920 : 1.7	-	-	Non toxic	Non toxic	Non toxic	Non toxic	Non toxic	Non toxic

<sup>(1)</sup> Other available thicknesses : 1.5, 1.8 and 2.0 mm.

<sup>(2)</sup> Top ply colour (bottom plys is always black): White, Lead grey, Green, Terra cotta and colours available on request on special order.

<sup>(3)</sup> With Bianco Reflecta (color of top layer) SRI = 102% and Reflectance (Albedo) = 91% (500 - 1000nm). Bottom color is black (signal layer).

<sup>(4)</sup> Not tested at lower temperatures

<sup>(5)</sup> Warrington Fire B<sub>Roof</sub> T1 on non combustible support (Concrete).

<sup>(6)</sup> Available on demand for special orders in the FM approved version.

<sup>(7)</sup> B<sub>Roof</sub> T4 (Under certification).

\* The FB specifications are for TPO/FPA membrane layer unless when shown.

**Note:** In relation to the different application of the products and the influence of factors beyond our control (supports, conditions of use, non compliance with instruction, etc) it is possible for IMPER ITALIA S.p.A. to assume any responsibility for results. Progress combined with constant research to achieve the highest possible level of performance may, in time, modify the information contained in this publication without IMPER ITALIA S.p.A. being obliged to inform all those concerned.

ISO 9001  
ISO 14001  
OHSAS 18001  
BUREAU VERITAS  
Certification



**DIVISION RUBBERFUSE**

Via Volta, 9  
10071 Mappano Borgaro (Torino) Italy  
tel. +39 011 222 54 99 – fax +39 011 262 51 87  
e-mail: export@imper.it



**IMPER ITALIA S.p.A.**  
Via Volta, 8 – 10071 Mappano Borgaro (Torino) Italy  
www.imper.it – e-mail: imper@imper.it