

STARFLEX HR-FR

BROOF T4 AND BROOF T2 FIRE-CERTIFIED PURE POLYUREA SYSTEM HIGH PERFORMANCE APPLICABLE IN FLUID STATE BASED ON ISOCYANATE PREPOLYMERS AND A MIXTURE OF SPECIAL MODIFIED POLYAMINES FREE FROM PLASTICISERS AND SOLVENTS



CHARACTERISTICS

Very fast curing and achievement of final resistance characteristics.

Waterproof and **good resistance** to aggressive chemicals.

High elasticity, tenacity, puncture resistance, abrasion and wear resistance with crack bridging ability.

Can also be applied **vertically** and on ceilings.

Suitable for roofing where **photovoltaic panels** are present or to be installed.

Fire resistant **BROOF T4 certified**.

Certification for liquid waterproofing products ETA 25/0372 issued by ITAB/ITC-CNR.

Meets the requirements of standard **1504-2** for coatings: moisture control product 2.2 (C), physical resistance 5.1 (C), chemical resistance 6.1(C), increase in resistivity 8.2 (C).

Certified for **hail resistance according to UNI EN 13583:2012**.

APPLICATION TEMPERATURE

Applicable **from -20°C to +40°C** (substrate temperature), dew point > 5°C (no condensation).

OPERATING TEMPERATURE

Operating temperature **from -40°C to +90°C** in air.

FIELD OF USE

Fire-certified waterproofing of roofs and civil and industrial coverings in:

- Concrete or fibre cement
- Sheathing
- Metal

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PREPARATION OF THE SUBSTRATE

- The surfaces to be treated must be **sound, compact, free of dust and contamination** from foreign substances (dirt, oil, grease, release agents, etc.)
- After adequate mechanical preparation, the **cementitious substrate** must have a surface tensile strength greater than 1.5 MPa, measured using suitable equipment.
- In the case of **ceramic substrates or old resin coatings**, after adequate mechanical preparation, their correct adhesion to the substrate and the absence of traces of contaminants must be verified.
- Damaged **joints, holes** and other **irregularities** must be properly levelled and repaired with epoxy filler such as **STARCEMENT 385**, or epoxy mortar such as **DUROGLASS P1/2** suitably loaded with quartz or **ADDENSANTE NT2**.
- In the case of **vertical surfaces** (tanks, swimming pools, reservoirs, etc.), preparation can be carried out by dry or wet sandblasting or high-pressure washing (300 bar).

It is essential to **roughen** and/or **wash** the surface before application. The choice of mechanical preparation method (pressure washing, sandblasting, sanding, smoothing, shot blasting or milling) should be based on the condition and type of substrate.

The correct primer must be selected based on the type of substrate and intended use.

BITUMINOUS MEMBRANES: Substrate preparation carried out by high-pressure washing (> 300 bar) to obtain a clean surface free of any contaminants. Application of **PRIMER 0230** or **PRIMER 0130R**, a polyurethane primer specially formulated for the installation of 'moisture-curing' waterproofing membranes. Approximate product consumption 0.15 kg/m². Alternatively, apply a two-component epoxy resin-based primer in aqueous dispersion **STARCEMENT 5/A** by roller or airless spray, with a consumption of 0.1 kg/m² diluted in a 1:1 ratio with water, to consolidate the protective slate layer of the bituminous membranes.

TILES: thoroughly clean the substrate with detergents and lightly sandblast, smooth or shot-blast. Then apply a two-component anti-corrosive primer with good adhesion to metal surfaces and various materials, **DUROGLASS FF4416**, by roller or airless spray, at a consumption rate of 0.2 kg/m². Alternatively, use **DUROGLASS P1/2**, a solvent-free two-component epoxy primer for thick skim coats (starting from 0.3 kg/m²).

CONCRETE: cleaning can be carried out by sandblasting, pressure washing or shot blasting. Apply a two-component anti-corrosive primer with good adhesion to different types of surfaces, **DUROGLASS FF4416**, by roller or airless spray, with a consumption of 0.2 kg/m². Alternatively, use **PRIMER 0260**, a fast-drying, single-component polyurethane solvent (0.15-0.20 kg/m²). For thick skimming, use **DUROGLASS P1/2**, a solvent-free two-component epoxy primer (starting from 0.30 g/m²). It is possible to use the two-component epoxy primer **DUROGLASS P2 PRIMER** with a recommended consumption of 0.4 kg/m².

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DAMP SURFACES: Substrate preparation by high-pressure washing (> 250 bar) or sanding followed by vacuuming of the resulting dust. Application of two coats of special three-component epoxy resin-based primer for the preparation of damp concrete surfaces **DUROGLASS FU BIANCO TIX** diluted with 15% water, with an approximate consumption of 0.5 kg/m² per application. Alternatively, application of a two-component epoxy resin-based primer **DUROGLASS FU RAPID**, diluted with 15% water, with an approximate consumption of 0.50 kg/m², followed by dusting with quartz of 0.1-0.3 mm grain size.

WOOD: application of **PRIMER 0230**, a polyurethane primer specially formulated for the installation of moisture-curing waterproofing membranes. Approximate product consumption 0.15 kg/m².

ALUMINIUM/IRON: metal surfaces (e.g. pre-painted sheet metal or aluminium) and carbon steel surfaces must be prepared by sandblasting in accordance with SSPC-SP10 to grade Sa 2 1/2, followed by the application by roller or airless spray of a two-component anti-corrosive primer with adhesion to different types of surfaces, **DUROGLASS FF4416**, with a consumption of 0.2 kg/m². If necessary, subsequent manual bonding of self-adhesive butyl tape coated with non-woven fabric on the overlaps of the sheets perpendicular to the slope of the roof, to distribute the stresses.

PVC/TPO/EPDM or OLD POLYURETHANE/POLYURETHANE COATINGS: Substrate preparation carried out by high-pressure washing (> 300 bar) to obtain a surface free of any contaminants, suitable for the subsequent application of the waterproofing system. Application of a single-component flexible adhesion promoter based on polyurethane resins **PRIMER 0130R**, with a consumption of 0.15 kg/m². Alternatively, application of a two-component anti-corrosive primer with adhesion to different types of surfaces, **DUROGLASS FF4416**, with a consumption of 0.2 kg/m².

PLEASE NOTE: the product is not intended exclusively for roofing for which fire certification is required. The fields of use refer in general to compatible substrates. For **BROOF(t4)** or **BROOF T2** certified solutions, please contact the Technical Department, which will indicate the most suitable configuration and provide the relevant documentation.

PRODUCT PREPARATION

Two-component product, applicable with high-pressure bi-mixer airless sprayer, preferably controlled by PLC for dosing and flow rate, equipped with a suitable mixing gun for polyurea systems (reaction in the gun).

The application technology for these products requires that the spray temperature of component A be 60°C ± 5°C and that of component B be 80°C ± 5°C.

Lower temperatures may cause the product to fail to harden and not achieve its properties.

The equipment must be equipped with in-line heaters, heated tanks and pipes.

The components of **STARFLEX HR-FR** must not be contaminated with any chemical agents (solvents, oils, water or anything else) as this would seriously compromise the characteristics of the product.

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PRODUCT APPLICATION

STARFLEX HR-FR can be applied to:

- Bi-mixer pump and special gun

Mix component A thoroughly before spraying. **STARFLEX HR-FR** can be applied with a minimum consumption of **2.2 kg/m²** depending on the desired final thickness.

The correct mixing ratio of the two components, which must be 1:1, must be checked at each drum change, ensuring that no residual material remains.

To create surfaces with a certain degree of slip resistance, immediately after applying the first coat of **STARFLEX HR-FR**, rotate the gun so that it is parallel to the surface to be treated, keep the nozzle pointing upwards and move your arm in a swinging motion to create a 'rain' of **STARFLEX HR-FR**.

OVER-APPLICATION

If the membrane is to be exposed to sunlight, colour changes (yellowing) may occur, and it will therefore be necessary to apply aliphatic polyurethane finishes such as **POLISTAR E/P** or **POLISTAR E/2 N** to the surface as required.

Application must be carried out within 3-4 hours of applying **STARFLEX HR-FR**.

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WARNINGS AND PRECAUTIONS

- If work is interrupted, apply a coat of **DUROGLASS FF4416** as a primer, considering its over-application window, which, in the case of **STARFLEX** line coatings, ranges from a minimum of 24 hours to a maximum of 7 days. If rain occurs during this time, apply a coat of **PRIMER 0230** or **PRIMER 0130R**, allowing the primer to dry (tack free) before applying the polyurea.
- If the product is to be applied to roofs with insulation or other compressible surfaces, especially in winter, wait approximately 6-8 hours until the product has completely cured before walking on it. Failure to comply with these instructions may cause micro-lesions that are not immediately visible, but which may develop into through-lesions in the following months.
- In case of problems during the application of polyurea, such as machine blockages, contact the Technical Department immediately.

SAFETY AND CLEANING

When applying these products, it is recommended to use goggles, masks and rubber gloves and all PPE required by current regulations.

The hardened product can be removed from equipment by immersion in N-methylpyrrolidone, dimethylformamide or, less effectively, **DILUENTE 6**.

For further information on precautions for use, refer to the safety data sheet.



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TECHNICAL DATA SHEET		
Colour		Neutral or RAL chart
Specific weight	UNI EN ISO 2811-1	Component A 1.03 ± 0.05 kg/l Component B 1.11 ± 0.05 kg/l
Viscosity at 20°C	UNI EN ISO 2555	Component A 650 ± 200 mPa·s Component B 1250 ± 250 mPa·s
Pot life at 22°C	UNI EN ISO 9514	3-4 seconds
Mixing ratio		1: 1 by volume 1: 1 by weight
Non-volatile substances	UNI EN ISO 3251	99,8 %
Hardening at 22°C, 50% RH		- gel time: 3 seconds* - touch dry: 1 minute - walkable: 40 minutes - recoatable: 80 minutes - trafficable: 12 hours
Adhesion to concrete	EN 1542	> 3,0 MPa
Adhesion to metal	EN 13144	> 7,0 MPa
Adhesion to fibre cement	EN 1062-6 (metodo A)	> 1,4 MPa
Permeability to carbon dioxide	EN 1062-6	R > 50 m
Permeability to water vapour	UNI ISO 7783-2	Class I
Capillary absorption and water permeability	UNI EN 1062-3	$w < 0,1 \text{ kg/m}^2 \cdot \text{h}^{0.5}$
Fire resistance certification		BROOF T4, BROOF T2
Adhesive strength for direct traction	UNI EN 1542	> 3,00 MPa
Impact resistance	UNI EN ISO 6272	20Nm (Class III, no damage)
Wear resistance	UNI EN ISO 5470-1	H22 grinding wheel 1000 g 1000 rpm: < 31 mg
Thermal shock resistance	UNI EN 13687-05	> 3,3 MPa
Elongation at break	UNI EN 12311-2	> 450 %
Tensile strength	UNI EN 12311-2	> 16 MPa
Resistenza a trazione, -20°C	UNI EN 12311-2	> 14,3 MPa
Allungamento a rottura, -20°C	UNI EN 12311-2	> 114 %
Tear resistance	UNI EN 12310-2	> 80 N/mm

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TECHNICAL DATA SHEET

Shore hardness D	EN ISO 868	> 45
Crack bridging	UNI EN 1062-7	Method B, dynamic: B1 (23); B2 (23); B3.1 (23); > B4.1 (23) Method A, static: A5 (23)
Ozone resistance	UNI EN 1844	Excellent
Resistance to severe chemical attacks	EN 13529	Hydrocarbon mixture: Class I and II Acetic acid 10%: Class I and II Sulfuric acid 20%: Class I and II Sodium hydroxide 20%: Class I and II Sodium chloride: Class I and II
Storage		The product in its original sealed packaging, stored in a dry place at temperatures between +5°C and +35°C, can be kept for 12 months.

CR4: 60% toluene – 30% xylene – 10% methylnaphthalene

CR9: 10% acetic acid

CR10: 20% sulphuric acid

CR11: 20% sodium hydroxide

CR12: 20% sodium chloride

The data and instructions provided in this data sheet, based on the best practical and laboratory experience, are to be considered indicative in all cases. Given the different conditions of use and the intervention of factors independent of MPM (support, environmental conditions, technical installation instructions, etc.), those intending to use the product are required to determine whether or not it is suitable for the intended use. Our warranty is limited to the quality and consistency of the finished product for the data shown above, only for technical data sheets stamped and countersigned by authorised personnel at our headquarters. The customer is also required to verify that these values are valid for the batch of product of interest and have not been exceeded or replaced by subsequent editions and/or new formulations. The data contained herein may vary at any time without prior notice from MPM.