STARFLEX HR-E

HIGH-PERFORMANCE HYBRID POLYUREA SYSTEM APPLICABLE IN FLUID STATE BASED ON AROMATIC ISOCYANATES AND A MIXTURE OF SPECIAL AMINES

EN 1504-2 | SOLVENT-FREE | HIGH CRACK BRIDGING | ELASTIC | ETA DANMARK

CHARACTERISTICS

Rapid hardening and achievement of final resistance and elasticity characteristics.
Waterproof and good resistance to aggressive chemicals.
High **elasticity, tenacity, resistance to puncturing**, abrasion and wear with crack bridging ability.
Can also be applied **vertically** and to ceilings.
Certification for liquid waterproofing products ETA 25/0372 issued by ITAB/ITC-CNR.
Meets the requirements of standard **1504-2** for coatings: product for moisture control 2.2 (C), physical resistance 5.1 (C), chemical resistance 6.1(C), increase in resistivity 8.2 (C).

APPLICATION TEMPERATURE

Applicable **from +5°C to +45°C** (substrate temperature), dew point > 3°C (no condensation).

OPERATING TEMPERATURE

Operating temperature **from -30°C to +85**°C in air.

FIELD OF USE

- Waterproofing of **road**, motorway and railway **bridge and viaduct** decks.
- Waterproofing of **underground structures** (foundations, retaining walls, suspended structures, etc.).
- Waterproofing of **tunnel extrados**.
- Waterproofing of **civil and industrial roofs**.
- Protection and waterproofing of roofs insulated with **polyurethane foam**.
- Protection and encapsulation of fibre cement.

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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 by high-pressure washing (> 300 bar) to obtain a clean surface free of any contaminants. Application of PRIMER 0230, a polyurethane primer specially formulated for the installation of moisture-curing waterproofing membranes.
Approximate product consumption 0.15 kg/m^2. Also available in the ultra-fast version **PRIMER 0230R**. 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/m^2 diluted in a 1:1 ratio with water, in order 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/m^2. Alternatively, use **DUROGLASS P1/2**, a solvent-free two-component epoxy primer for thick skim coats (starting from 0.3 kg/m^2).

CEMENT: 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**, using a roller or airless spray, at a consumption rate of 0.2 kg/m^2.
Alternatively, use **PRIMER 0260**, a fast-drying, single-component, solvent-based polyurethane primer (0.15-0.20 kg/m^2). For thick skim coats, use **DUROGLASS P1/2**, a solvent-free two-component epoxy primer (starting from 0.30 g/m^2). The two-component epoxy primer **DUROGLASS P2 PRIMER** can be used with a recommended consumption of 0.4 kg/m^2.

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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/m^2 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/m^2, followed by dusting with 0.1-0.3 mm quartz.

WOOD: application of **PRIMER 0230**, a polyurethane primer specially formulated for the installation of moisture-curing waterproofing membranes. Approximate product consumption 0.15 kg/m^2.

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/m^2. 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, in order to distribute the stresses.
Alternatively, application of a single-component polyurethane resin-based primer **PRIMER 0130**, with consumption of 0.15 kg/m^2.

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 0130**, with consumption of 0.15 kg/m^2.
Alternatively, application of a two-component anti-corrosive primer with adhesion to different types of surfaces, **DUROGLASS FF4416**, with consumption of 0.2 kg/m^2.

PRODUCT PREPARATION

Two-component product, applicable with a high-pressure bi-mixer airless sprayer, preferably controlled by a 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 spray temperatures to be between 70 and 80°C.
Lower temperatures may prevent the product from hardening and achieving its properties.
The equipment must be equipped with in-line heaters, tanks and heated pipes.
The components of **STARFLEX HR-E** 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-E can be applied to:
• Bi-mixer pump and special gun

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

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, POLISTAR E, POLISTAR E/2, POLISTAR E/3** to the surface as required.

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

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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**, 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.
- **STARFLEX HR-E** exposed to UV rays may show colour variations and slight chalking without compromising its mechanical characteristics. To avoid such variations, protection with an aliphatic polyurethane finish from the **POLISTAR** range is necessary.
- In the event of **excessive moisture** on the substrate, a phenomenon of blistering may occur.

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		
Colour		Neutral or RAL chart
Specific weight	UNI EN ISO 2811-1	1,1 ± 0,03 Kg/l
Viscosity at 20°C	UNI EN ISO 2555	Component A 900 ± 150 mPa·s Component B 1200 ± 250 mPa·s
Pot life at 22°C	UNI EN ISO 9514	6-7 seconds
Mixing ratio		1: 1 by volume and weight
Non-volatile substances	UNI EN ISO 3251	> 99,9 %
Hardening at 22°C, 50% RH		- hard to the touch: 8 minutes - walkable: 25 minutes - completely hardened:
Permeability to carbon dioxide	EN 1062-6 (metodo A)	R > 50 m
Permeability to water vapour	UNI ISO 7783-2	Class I
Capillary absorption and water permeability	UNI EN 1062-3	$w < 0,1\ kg/m^2 \cdot h^{0,5}$
Adhesive strength by direct traction	UNI EN 1542	> 3,0 MPa
Drop of a mass	UNI EN ISO 6272	20Nm
Wear resistance	UNI EN ISO 5470-1	< 40 mg (Mola H22 1000 g 1000 rpm)
Crack bridging	UNI EN 1062-7	Method A, static: A5 (23° C) Method B, dynamic: B4.1 (23°C)
Thermal shock resistance	UNI EN 13687-05	> 2,2 MPa
Elongation at break	UNI EN 12311-2	> 600 %
Tensile strength	UNI EN 12311-2	> 14 MPa
Shore A hardness	EN ISO 868	> 70
Flash point of components		> 95°C

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DATI TECNICI		
Resistance to severe chemical attacks	UNI EN 13529	Sulfuric acid 20%: Class I and II Sodium hydroxide 20%: Class I and II Sodium chloride 20%: Class I and II Surfactants: 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, has a shelf life of 12 months.

CR10: 20% sulphuric acid
CR11: 20% sodium hydroxide
CR12: 20% aqueous sodium chloride solution
CR14: Surfactants