BUILDING TRUST

PRODUCT DATA SHEET

# Sarnafil® TS 77-20 E

POLYMERIC MEMBRANE FOR MECHANICALLY FASTENED ROOF WATERPROOFING

## PRODUCT DESCRIPTION

Sarnafil® TS 77-20 E (thickness 2,0 mm) is a polyester reinforced, multi-layer, synthetic roof waterproofing sheet based on flexible polyolefins (FPO) containing ultraviolet light stabilizers, flame retardant and an inlay of glass non-woven according to EN 13956.
Sarnafil® TS 77-20 E is a hot air weldable roof membrane formulated for direct exposure and designed to use in all global climatic conditions. Sarnafil® TS 77-20 E is produced with an inlay of glass non-woven for dimensional stability and a polyester reinforcement for high strength.

## USES

Waterproofing membrane for:
- Mechanically fastened roofing systems
- Enhancement of solar reflection of existing TPO roofs (relevant only for colour RAL 9016 SR)

## CHARACTERISTICS / ADVANTAGES

- Proven performance over decades
- Various colours available
- Resistant to permanent UV exposure
- High dimensional stability due to glass fleece inlay
- Resistant to permanent wind exposure
- Resistant to all common environmental influences
- Resistant to micro-organisms
- Resistant to root penetration
- Compatible to old bitumen
- Hot air weldable
- Recyclable (Delete if recycling facilities or recycling offerings for roofing membranes are not available in local country)

## ENVIRONMENTAL INFORMATION

- Conformity with LEED v4 SSc 5 (Option 1): Heat Island Reduction - Roof (only traffic white)
- Conformity with LEED v4 MRc 2 (Option 1): Building Product Disclosure and Optimization - Environmental Product Declarations
- Conformity with LEED v4 MRc 3 (Option 2): Building Product Disclosure and Optimization - Sourcing of Raw Materials
- Conformity with LEED v4 MRc 4 (Option 2): Building Product Disclosure and Optimization - Material Ingredients
- Conformity with LEED v2009 SSc 7.2 (Option 1): Heat Island Effect - Roof
- Conformity with LEED v2009 MRc 4 (Option 2): Recycled Content
- IBU Environmental Product Declaration (EPD) available

## APPROVALS / STANDARDS

- CE Marking and Declaration of Performance to EN 13956 - Polymeric sheets for roof waterproofing
- FM Approved, Certification of Declaration, Sarnafil® TS 77-20 E, Approval Identification No. 3040803

## PRODUCT INFORMATION

| | | |
|---|---|---|
| **Chemical Base** | Flexible Polyolefins (FPO) | |
| **Packaging** | Sarnafil® TS 77-20 E standard rolls are wrapped individually in a blue PE-foil. | |
| | Packing unit: see price list<br>Roll length: 15,00 m<br>Roll width: 2,00 m<br>Roll weight: 72,00 kg | |
| | Refer to current price list for packaging variations | |
| **Appearance / Colour** | **Surface:** | |
| | Standard: matt<br>Solar reflective: glossy | |
| | **Colours:** | |
| | Top surface: beige<br>light grey (nearest RAL 7035)<br>window grey (nearest RAL 7040)<br>copper brown (nearest RAL 8004)<br>reseda green (nearest RAL 6011)<br>anthracite (nearest RAL 7016)<br>traffic white, solar reflective (RAL 9016 SR) | |
| | Bottom surface: black | |
| **Shelf Life** | 5 years from date of production. | |
| **Storage Conditions** | The product must be stored in original, unopened and undamaged sealed packaging in dry conditions at temperatures between +5 °C and +30 °C. Always refer to packaging. | |
| **Product Declaration** | EN 13956 | |
| **Visible Defects** | Pass | (EN 1850-2) |
| **Length** | 15 m (-0 % / +5 %) | (EN 1848-2) |
| **Width** | 2 m (-0,5 % / +1 %) | (EN 1848-2) |
| **Effective Thickness** | 2,0 mm (-5 % / +10 %) | (EN 1849-2) |
| **Straightness** | ≤ 30 mm | (EN 1848-2) |
| **Flatness** | ≤ 10 mm | (EN 1848-2) |
| **Mass per unit area** | 2,400 kg/m² (-5 % / +10 %) | (EN 1849-2) |

## TECHNICAL INFORMATION

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|---|---|---|---|
| **Resistance to Impact** | hard substrate: ≥ 900 mm<br>soft substrate: ≥ 1250 mm | | (EN 12691) |
| **Hail Resistance** | rigid substrate: ≥ 30 m/s<br>flexible substrate: ≥ 40 m/s | | (EN 13583) |
| **Resistance to Static Load** | soft substrate: ≥ 20 kg<br>rigid substrate: ≥ 20 kg | | (EN 12730) |
| **Tensile Strength** | longitudinal (md)[1]: ≥ 900 N/50 mm<br>transversal (cmd)[2]: ≥ 800 N/50 mm | | (EN 12311-2) |

[1] md = machine direction
[2] cmd = cross machine direction

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|---|---|---|---|
| **Elongation** | longitudinal (md)[1)] | ≥ 12 % | (EN 12311-2) |
| | transversal (cmd)[2)] | ≥ 12 % | |
| | [1)] md = machine direction<br>[2)] cmd = cross machine direction | | |
| **Dimensional Stability** | longitudinal (md)[1)] | ≤ \|0,2\| % | (EN 1107-2) |
| | transversal (cmd)[2)] | ≤ \|0,1\| % | |
| | [1)] md = machine direction<br>[2)] cmd = cross machine direction | | |
| **Tear Strength** | longitudinal (md)[1)] | ≥ 300 N | (EN 12310-2) |
| | transversal (cmd)[2)] | ≥ 300 N | |
| | [1)] md = machine direction<br>[2)] cmd = cross machine direction | | |
| **Joint Peel Resistance** | Failure mode: C, no failure of the joint | | (EN 12316-2) |
| **Joint Shear Resistance** | ≥ 500 N/50 mm | | (EN 12317-2) |
| **Foldability at Low Temperature** | ≤ -20 °C | | (EN 495-5) |
| **External Fire Performance** | BROOF(t1) > 20°<br>BROOF(t2)<br>BROOF(t3) < 10° | | (EN 1187)<br>(EN 13501-5) |
| **Reaction to Fire** | Class E | | (EN ISO 11925-2 classification to EN 13501-1) |
| **Effect of Liquid Chemicals, Including Water** | On request | | (EN 1847) |
| **Exposure to Bitumen** | Pass[3)]<br>[3)] Sarnafil® T is compatible to old bitumen | | (EN 1548) |
| **UV Exposure** | Pass (> 5000 h / grade 0) | | (EN 1297) |
| **Water Vapour Transimission** | μ = 190 000 | | (EN 1931) |
| **Water Tightness** | Pass | | (EN 1928) |

**Solar Reflectance** (ASTM C 1549)

| Colour | Initial | 3 years aged | Test Institute |
|---|---|---|---|
| white RAL 9016 SR | 0,89 | - | Intertek |

**Thermal Emittance** (ASTM C 1371)

| Colour | Initial | 3 years aged | Test Institute |
|---|---|---|---|
| white RAL 9016 SR | 0,89 | - | Intertek |

**Solar Reflectance Index** (ASTM E 1980)

| Colour | Initial | 3 years aged | Test Institute |
|---|---|---|---|
| white RAL 9016 SR | 112 | - | Intertek |

CRRC tested products are listed in Cool Roof Rating Council (CRRC) product data base.

**USGBC LEED Rating** (ASTM E 1980)

| Colour | Initial | 3 years aged |
|---|---|---|
| white RAL 9016 | SRI > 82 | - |
| white RAL 9016 SR | SRI > 82 | - |

Conform on the minimum requirements of LEED v4 SS credit 5 option 1 Heat Island reduction - Roof.

## SYSTEM INFORMATION

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| **System Structure** | The following products must be considered for use depending on roof design:<br>▪ Sarnafil® T 66-15 D Sheet for detailing<br>▪ Sarnafil® TS 77-E Strips<br>▪ Sarnafil® T Metal Sheet<br>▪ Sarnafil® T Welding Cord<br>▪ Sarnabar® / Sarnafast®<br>▪ Sarnafil® T Prep / Sarnafil® T Wet Task Set<br>▪ Sarnacol® T 660<br>▪ Solvent T 660<br>▪ Sarnafil® T Clean<br>Wide range of accessories is available e.g. prefabricated parts, roof drains, scuppers, walkway pads and decor profiles. |
| **Compatibility** | Sarnafil® TS 77-20 E may be installed on all thermal insulations and levelling layers suitable for roofing. No additional separation layer is required. Sarnafil® TS 77-20 E is suitable for installation directly on top of existing, carefully cleaned, levelled bituminous roofing, e.g. re-roofing over old flat roofs. Colour changes in membrane surface may occur in case of direct contact with bitumen. |

## APPLICATION INFORMATION

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| **Ambient Air Temperature** | -20 °C min. / +60 °C max. |
| **Substrate Temperature** | -30 °C min. / +60 °C max. |

## APPLICATION INSTRUCTIONS

### EQUIPMENT

**Hot welding overlap seams**
Electric hot air welding equipment, such as hand held manual hot air welding equipment and pressure rollers or automatic hot air welding machines with controlled hot air temperature capability of a minimum 600 °C.
Recommended type of equipment:

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| Manual | Leister Triac |
| Automatic | Sarnamatic 681 |
| Semi-automatic | Leister Triac Drive |

### SUBSTRATE QUALITY

The substrate surface must be uniform, smooth and free of any sharp protrusions or burrs, etc. Sarnafil® TS 77-20 E must be separated from any incompatible substrates / materials by an effective separation layer to prevent accelerated ageing. The supporting layer must be compatible to the membrane, solvent resistant, clean, dry and free of grease and dust. Metal sheets must be degreased with Solvent T 660 before adhesive is applied.

### APPLICATION

Reference must be made to further documentation where applicable, such as relevant method statement, application manual and installation or working instructions.
**Installation procedure**
Reference must be made to further documentation where applicable, such as relevant method statement, application manual and installation or working instructions.
**Fixing method- General**
The waterproofing membrane is installed by loose laying ( without stretching membrane or installing under tension) with mechanical fastening in seam overlaps or independent from overlaps. Overlap seams are hot welded using specialised hot air equipment.
**Fixing method-Linear fastening (Sarnabar®)**
Unroll the Sarnafil® TS 77-20 E membrane, overlap by 80mm, weld immediately and fix to the substructure by means of the Sarnabar® fasteners. The preferred type of fastening will be advised by Sika. The spacing of the fasteners is in accordance with the project specific Sika
calculations. The perimeter piece ends must be secured with the Sarnabar® Load Distribution Plate. For protection fasten a piece of Sarnafil® TS 77-20 E under bar end and plate. Leave a 10 mm clearance between bar ends. Do not fasten in hole nearest bar end. Cover the bar ends with a piece of Sarnafil® TS 77-20 E and weld. After installation the Sarnabar® must immediately be made watertight with a Sarnafil® TS 77-20 E cover strip. At upstands and at all penetrations, the Sarnafil® TS 77-20 E membrane must be secured with a Sarnabar®. The 4 mm diameter S-Welding Cord protects the Sarnafil® TS 77-20 E roof covering against tear ing and peeling off by wind uplift.
**Fixing method-Spot fastening (Sarnafast®)**
Sarnafil® TS 77-20 E must always be installed at right angles to the deck direction. Sarnafil® TS 77-20 E is fixed by means of the Sarnafast® fasteners and barbed washers/tubes along the marked line, 35 mm from the edge of the membrane. Sarnafil® TS 77-20 E is overlapped by 120 mm. The spacing of the fasteners is in accordance with the project specific Sika calculations. At upstands and at all penetrations, the Sarnafil® TS

77-20 E membrane must be secured with a Sarnabar ®. The 4 mm diameter S-Welding Cord protects the Sarnafil® TS 77-20 E roof covering against tearing and peeling off by wind uplift.

**Hot welding method**

Overlap seams must be welded by electric hot welding equipment. Welding parameters including temperature, machine speed, air flow, pressure and machine settings must be evaluated, adapted and checked on site according to the type of equipment and the climatic conditions prior to welding.

**Testing overlap seams**

The seams must be mechanically tested with screw driver to ensure the integrity/completion of the weld. Any imperfections must be rectified by hot air welding.

## FURTHER DOCUMENTS

**Installation**

- Application manual

## LIMITATIONS

Installation work must only be carried out by Sika® trained and approved contractors, experienced in this type of application.

- Ensure Sarnafil® TS 77-20 E is prevented from direct contact with incompatible materials (refer to compatibility section).
- Sarnafil® TS 77-20 E must be installed by loose laying and without stretching or installing under tension.
- The use of Sarnafil® TS 77-20 E membrane is limited to geographical locations with average monthly minimum temperatures of -50 °C. Permanent ambient temperature during use is limited to +50°C.
- The use of some ancillary products such as adhesives, cleaners and solvents is limited to temperatures above +5 °C. Observe temperature limitations in the appropriate Product Data Sheets.
- Special measures may be compulsory for installation below +5°C ambient temperature due to safety requirements in accordance with national regulations.

## VALUE BASE

All technical data stated in this Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

## LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for the exact product data and uses.

## ECOLOGY, HEALTH AND SAFETY

Fresh air ventilation must be ensured, when working (welding) in closed rooms. Installation of RAL 9016 SR type requires the use of UV protection goggles.

**REGULATION (EC) NO 1907/2006 - REACH**

REGULATION (EC) NO 1907/2006 - REACH: This product is an article as defined in article 3 of regulation (EC) No 1907/2006 (REACH). It contains no substances which are intended to be released from the article under normal or reasonably foreseeable conditions of use. A safety data sheet following article 31 of the same regulation is not needed to bring the product to the market, to transport or to use it. For safe use follow the instructions given in this product data sheet. Based on our current knowledge, this product does not contain SVHC (substances of very high concern) as listed in Annex XIV of the REACH regulation or on the candidate list published by the European Chemicals Agency in concentrations above 0.1 % (w/w).

## LEGAL NOTES



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