

# Specification

***Suggested For:***

**Example Mechanically Fastened PVC Specification (S327-EL Sarnafast)**

Our Reference:

**NA**

Date:

**NA**



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Registered in England: Number 226822

**Sarnafil**®

Project No: NA  
Date: NA

## J42 SINGLE LAYER POLYMERIC SHEET ROOF COVERINGS S327

To be read with Preliminaries / General conditions and the Sarnafil project specific specification.

The details contained within this proposal are based on information available at the time of writing. It covers the installation of Sarnafil materials and the preparation work necessary to provide a suitable substrate. Sika Ltd cannot be held responsible for unknown site conditions or for the performance of materials within the system other than Sarnafil products or Sarnafil branded products.

A detailed method of work statement and programme of works should be agreed with the Sarnafil Registered Contractor before the commencement of the works.

The requirements of all relevant British Standards and Industry Codes of Practice should be complied with at all times. A bibliography is available upon request.

### TYPES OF COVERING

- 110 WARM ROOF COVERING - **Example Mechanically Fastened PVC Specification (S327-EL Sarnafast)**
- Substrate: Install profiled metal decking to suit the span of the purlins and all anticipated loads as specified by the architect or structural engineer. Minimum 0.7mm thick.
  - Roof covering:
    - Manufacturer: Sika Ltd, Sika Sarnafil, Robberds Way, Bowthorpe, Norwich, NR5 9JF, Tel 01603 748985, Fax 01603 743054
    - Vapour Control Layer: Sarnavap 1000E as clause 395 and 396B
    - Manufacturer: Sika Ltd, Sika Sarnafil, Robberds Way, Bowthorpe, Norwich, NR5 9JF  
Laying: Loose lay and overlap all side and end laps by a minimum 100mm, seal with Sarnavap jointing tape. As clause 670A
    - Insulation: Polyisocyanurate Rigid Insulation as clause 420A  
Attachment: Mechanically fixed as clause 682B
    - Waterproof membrane: Sarnafil S327-12EL Lacquered Reinforced PVC Membrane  
Thickness: 1.2mm  
Colour: Light Grey  
Attachment: Sarnafast Mechanically Fastened as clause 355, 710A, and 711B
  - Surface protection: Sarnatred as clause 850
    - Laying: Hot air welded
  - Accessories: Drainage: Double L Insulated RWO  
Fall Arrest: Sarnafil Constant Force posts  
Flashings: Sarnametal  
Lightning Protection: Fit Sarnafil Heat Weldable Lightning Conductor Clips  
Rooflights: SarnaLite Rooflights  
Walkways: SarnaTred Walkway Tiles



## PERFORMANCE

### 201B MANUFACTURER'S GUARANTEE

In order to comply with the 10 year Sarnafil insurance backed guarantee, the work is to be carried out by a Sarnafil Registered Contractor.

### 210 ROOF PERFORMANCE

- Roof covering: Secure, free draining and weathertight.

### 220 AVOIDANCE OF INTERSTITIAL CONDENSATION: WARM AND INVERTED ROOFS

- Determine: Interstitial condensation risk of roof construction as recommended in BS 6229.
- Basic design data:
  - Outdoor notional psychrometric conditions, winter:  
Temperature:  $-5^{\circ}\text{C}$ .  
Relative humidity: 90%.  
Vapour pressure: 0.36 kPa.  
Duration: 60 days.
  - Outdoor notional psychrometric conditions, summer:  
Temperature:  $18^{\circ}\text{C}$ .  
Relative humidity: 65%.  
Vapour pressure: 1.34 kPa.  
Duration: 60 days.
  - Indoor notional psychrometric conditions:  
Temperature: \_\_\_\_\_ .  
Relative humidity: \_\_\_\_\_ .  
Vapour pressure: \_\_\_\_\_ .
  - Winter interstitial condensate (warm roof):
    - Calculated amount (maximum):  $0.35 \text{ kg/m}^2$ .
    - Calculated annual net retention: Nil.
  - Vapour control layer: If necessary, provide a suitable membrane or sealed deck so that damage and nuisance from interstitial condensation do not occur.

### 225 AVOIDANCE OF INTERSTITIAL CONDENSATION: WARM AND INVERTED ROOFS

- Determine: Interstitial condensation risk of roof construction as recommended in BS 5250, annex D.
- Vapour control layer: If necessary, provide a suitable membrane so that damage and nuisance from interstitial condensation do not occur.

### 240A ATTACHMENT OF ROOF COVERING INCLUDING INSULATION

- Requirement: Determine methods of attachment to resist wind loads. Provide for relative movement of materials and effects of vapour pressure. Do not reduce performance of vapour control layer.
- Wind loads: Calculate to BS 6399-2 incorporating Amendment 1, Hybrid Method.
  - Basic wind speed ( $V_b$ ): (TBC) m/s
  - Altitude factor ( $S_a$ ): (TBC)
  - Direction factor ( $S_d$ ): (TBC)
  - Seasonal factor ( $S_s$ ): 1.000
  - Probability factor ( $S_p$ ): 1.000
  - Terrain and building factor ( $S_b$ ): (TBC)
  - Size effect factor ( $C_a$ ): 1.000



## **PRODUCTS**

### **310A ANCILLIARY PRODUCTS AND ACCESSORIES (where applicable)**

- Types: Recommended Sarnafil products to be used where required.
- Drainage: Fit Sarnafil Double L fully insulated, high drainage capacity RWO, ensuring Part L compliance with air tightness and thermal insulation continuity at the deck opening
- Decoration: Fit Sarnafil Décor Profile standing seams or Sarnafil Batten Profiles.
- Fall Arrest: The Sarnafil Constant Force posts fall arrest/restraint system should be considered for rooftop safety.
- Flashings: Sarnametal
- Lightning Protection: Fit Sarnafil Heat Weldable Lightning Conductor Clips.
- Rooflights: Fit SarnaLite rooflights.

### **330A TIMBER TRIMS, ETC**

- Quality: Planed. Free from wane, pitch pockets, decay and insect attack except ambrosia beetle damage.
- Moisture content: Not exceeding 22% at time of covering.
  - Preservative treatment: To British Wood Preserving and Damp-roofing Association Commodity Specification C8.
  - Type: \_\_\_\_\_
  - If treated timber is in direct contact with Sarnafil membrane: only aqueous, salt-based preservative is to be used.

### **345 PERIMETER TRIMS**

- Type: Galvanised steel sheet with Sarnafil membrane factory laminated
- Manufacturer: Sika Ltd.
  - Product reference: Sarnametal.
- Colour: Light Grey
- Size: (TBC)

### **355 MECHANICAL FASTENERS, WASHERS, PRESSURE PLATES, ETC.**

- Type: In accordance with the current addition of the British board of Agrément MOAT 55 'UEAtc Supplementary guide for the assessment of mechanically fastened roof waterproofing' for Class 2 fasteners or a suitable alternative recommended in writing for use with Sarnafil systems.
- Manufacturer: SFS intec Ltd
- Product reference: As clause 681B.

### **395 VAPOUR CONTROL LAYER**

- Type: Polyethylene
  - Manufacturer: Sika Ltd
  - Product reference: Sarnavap 1000E
  - Thickness: 0.22mm
- Vapour resistance: > 800 MNs/g.

### **396B VAPOUR CONTROL LAYER SPECIFICATION**

In accordance with BS 5250:2002 Code of Practice for control of condensation in buildings (Table B5) the suitability of the vapour control layer specified below is based on the Humidity Class 3.

Should the specifier require a different Humidity Class to be used for this design, then Sika Ltd should be notified. A change of Humidity Class will probably require a change to the specification for the vapour control layer.

### **Vapour Control Layer (Sarnavap)**

Over the structural deck loosely lay a Sarnavap 1000E flame retarded, polyethylene vapour control layer. All side and end laps to be a minimum of 100mm and continuously sealed with Sarnavap jointing tape. To provide continuity of the vapour control layer the Sarnavap should have fully supported laps and is to be sealed to the abutment at the perimeter of the roof and around all penetrations. The surface of the abutment should be smooth to allow an adequate airtight seal of the Sarnavap.

For the Sarnafil guarantee to include the vapour control layer, the appropriate Sarnavap must be used.

#### **420A RIGID URETHANE FOAM WARM ROOF INSULATION**

- Rigid urethane foam (RUF) roofboard to BS EN 13165
- Manufacturer: Kingspan Insulation Ltd / Celotex Ltd / Recticel Insulation Ltd
- Product reference: LPC/FM approved Thermarof TR26/TR27 / Celotex EL3000 / Celotex TA3000 / Powerdeck F / Powerdeck
- Edges: Staggered bond pattern with lightly butted joints
- Thickness: (TBC to achieve the required U Value) mm
- Facing: Mineral Glass Tissue/Foil

#### **485 MEMBRANE WALKWAY**

- Manufacturer / Supplier: Sika Ltd
- Product reference: SarnaTred G/S
- Width: 600mm (750mm incl tabs)
- Thickness: 7mm
- Colour: Grey
- Finish: 3mm deep chevron pattern tread
- Reinforcement: Where required install a minimum 0.9mm thick galvanised steel spreader sheet under the Sarnafil membrane to the same width as the chosen walkway in accordance with the recommendations for Sarnafil systems.

### **EXECUTION GENERALLY**

#### **510 ADVERSE WEATHER**

- General: Do not lay membrane at temperatures below 5°C or in wet or damp conditions unless effective temporary cover is provided over working area.
- Unfinished areas of roof: Keep dry and protect edges of laid membrane from wind action.

#### **520A INCOMPLETE WORK**

- End of working day: Provide temporary seal to prevent water infiltration.
- On resumption of work: Cut away tail of any contaminated Sarnafil membrane from completed area and remove from roof.

#### **550 CONTROL SAMPLES**

- Type of covering: \_\_\_\_\_
- Sample area (minimum): \_\_\_\_\_
  - Location: \_\_\_\_\_
  - Features: \_\_\_\_\_
- Approval of appearance: Obtain before proceeding with remaining work.



## SUBSTRATES/ VAPOUR CONTROL LAYERS/ WARM ROOF INSULATION

### 610 SUITABILITY OF SUBSTRATES

- Surfaces to be covered: Secure, clean, dry, smooth, free from frost, contaminants, voids and protrusions.
- Preliminary work: Complete, including:
  - Grading to correct falls.
  - Formation of upstands, kerbs, box gutters, sumps, grooves, chases and expansion joints.
  - Fixing of battens, fillets and anchoring plugs/ strips.
- Moisture content and stability of substrate: Must not impair integrity of roof.

### 640 FIXING TIMBER TRIMS

- Fasteners: \_\_\_\_\_
- Fixing centres (maximum): \_\_\_\_\_

### 670A LAYING A NON BITUMINOUS VAPOUR CONTROL LAYER

- Laying: Sheets loose, flat and without wrinkles.
- Side and head laps: Seal using materials and method recommended by the vapour control layer manufacturer.
- Upstands, kerbs and other penetrations: Enclose edges of insulation. Fully seal at abutment by bonding or taping.

### 682B INSTALLING WARM ROOF MECHANICALLY FASTENED SARNATHERM PIR INSULATION

- Setting out:
  - Long edges: Fully support and for metal decks, run at right angles to troughs.
  - End edges: Adequately support
  - Joints: Butted together
  - End joints: Staggered
- Mechanical fixings: Sarnafil SBIW-70 x 70 washers and telescopic SBT screw fasteners as clause 240.

For 600mmx1200mm board size there should be a minimum of **(TBC)**no. fasteners per board in the centre of the roof and a minimum of **(TBC)**no. fasteners per board in the perimeter of the roof.

For 1200mmx2400mm board size there should be a minimum of **(TBC)**no. fasteners per board in the centre of the roof and a minimum of **(TBC)**no. fasteners per board in the perimeter of the roof.

All fixings and washers must be in an even pattern (see Sarnafil "Typical Fastener Layouts for PIR Insulation" drawing for further information) and located >50mm and <150mm from the edges and corners of the board and not overlap board joints.

- Completion: Boards must be in good condition, well fitting and with no springing, flexing or rocking.

## WATERPROOF COVERINGS/ ACCESSORIES

### 710A MECHANICAL FIXING OF WATERPROOF MEMBRANE

- Installing fasteners:
  - Use Sarnafil SBF/TI or SBT thermally broken fastenings using SFS intec Ltd recommended equipment, fitted with bit stop, etc.
  - Insertion: Correct and consistent.
  - For Sarnafast Install Sarnafil SFT thermally broken using correct SFS intec Ltd installation tool.
  - Insertion: Correct and consistent.
  - For Sarnafast pressure plates must not be less than 5mm from edge.
  - Fixing: Flush with membrane.
- Sheet overlaps: For Sarnafast the overlapping sheet must extend beyond pressure plates by not less than 65mm.
- Surface condition at completion: Smooth.

### 711B SARNAFAST MEMBRANE ATTACHMENT. Extract from Sarnafil specification.

#### Membrane

Loosely lay Sarnafil S327-12EL Light Grey polyester reinforced roofing membrane and hot air weld all end laps.

Mechanically fasten 2m wide Sarnafil membrane with Sarnafil SFT thermally broken fasteners along the edge of the membrane, as indicated by the ink dot line, at a maximum spacing of **(TBC)**mm, **(TBC)**no./linear metre. The fastener must penetrate and project below a metal (minimum 20mm if the deck has a stiffening rib) or timber deck by a minimum of 15mm or have a minimum embedment of 25mm into a concrete deck. The fastener density for the roof is **(TBC)**/m<sup>2</sup>, this may vary if the fastener type is changed from the type specified above.

Sarnafil thermally broken fasteners must be installed with the appropriate tooling and the membrane must be pre-punched with the Sarnafil SMP tool.

Overlap subsequent sheets by a minimum of 120mm to cover fasteners and washers and heat weld the lap using a Sarnamatic 641mc/661 automatic welding machine. The fastener rows to be at 1880mm maximum centres.

For metal decks the membrane should be fastened at 90° to the deck corrugations.

A Sarnabar and G/S welding cord or an alternative approved perimeter fixing method is to be installed at the perimeter of the roof and around all penetrations.

NB: Should an independent freestanding handrail system be fitted on the roof surface it may be necessary to fit a Sarnabar around the counterweights to isolate the dynamic loads on the membrane, depending on the anticipated wind uplift. Consult Sarnafil Technical Services Department.

In the perimeter zone use 1m wide Sarnafil S327-12EL Light Grey membrane rolls or alternatively install intermediate rows of Sarnafil SFT thermally broken fasteners along the centre of 2m wide Sarnafil membrane rolls, fasten at the same centres as the central zone and weather with a 200mm wide Sarnafil S327-12EL Light Grey coverstrip hot air welded on either side of the row of fasteners. Intermediate rows of fasteners in the perimeter zone only should be terminated with a SBT Row Termination Washer or Bar End Washer where appropriate.

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The fastener rows in the perimeter zone will be at 940mm or 880mm centres depending on whether a 1m wide sheet is used. The fastener density for the perimeter zone of the roof is **(TBC)/m<sup>2</sup>**, this may vary if the fastener type is changed from the type specified above.

#### 730A WELDED JOINTING

- Side and end joints:
  - Laps (minimum): 120mm for Sarnafast
  - Preparation: Clean and dry surfaces for full width of joint.
  - Sealing: Heat weld with a Sarnamatic 641mc/661 automatic welding machine only
- Condition at completion: Fully sealed and watertight.
- Accessories: Sarnamatic 641mc/661 automatic welding machine

#### 760A PERIMETER OF SARNAFIL MEMBRANE

- General: Secure Sarnafil membrane with a Sarnabar and PVC cord at roof edge conditions, changes of plane, curb flashings, upstands to roof lights, etc. with Sarnafil approved mechanical fasteners.

#### 770A PERIMETER DETAILS

- Upstands, edge trims, drips, kerbs, etc: Form flashings from Sarnafil waterproof membrane material. Edge trims and drips to be formed from Sarnametal.
- Roof membrane: Terminate Sarnafil membrane in horizontal plane immediately adjacent to change in direction and secure with a Sarnabar and PVC cord.
- Flashings: Dress Sarnafil membrane flashing over the Sarnabar. Overlap horizontal Sarnafil roof membrane beyond the Sarnabar by (minimum): 50mm.
- Sealing: Hot air weld the overlap.

#### 780A ROOF PENETRATIONS THROUGH THERMOPLASTIC MEMBRANES

- Sarnafil roof membrane: Cut Sarnafil membrane around penetrations and secure Sarnafil membrane to deck with Sarnabar and PVC cord or SFT fasteners.
- Flanged sleeve:
  - Type: Form from Sarnafil roof membrane complete with base flange.
  - Dress Sarnafil membrane flashing over and around penetration.
  - Sealing: Weld flange to roof membrane.
  - Protection to top edge of sleeve: Flashing or compatible weathering cravat.

### **SURFACING**

#### 850 MEMBRANE WALKWAYS

- Material:
  - Manufacturer: Sika Ltd.  
Product reference: SarnaTred G/S walkway tiles.
  - Width: 600mm (750mm incl tabs)
  - Thickness: 7mm.
  - Colour: Grey.
  - Attachment: Hot air weld tabs to Sarnafil membrane.
  - Reinforcement: Where required fix to the deck a minimum 0.9mm galvanised steel plate wrapped in S-Felt T polyester fleece under an additional layer of Sarnafil membrane.



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## **COMPLETION**

### **910A INSPECTION**

Inspection of the roof installation whilst in progress and/or on completion must be made by the Sika Roofing Field Technician. Copies of Sarnafil site reports of intrim and final inspection to be made available if required and previously agreed with Sarnafil Registered Contractor.

### **920 ELECTRONIC ROOF INTEGRITY TEST (If required)**

- Testing authority: \_\_\_\_\_
- Timing of test: \_\_\_\_\_
- Condition of roof prior to testing:
  - Sarnafil membrane complete to a stage where integrity can be tested.
  - Surface: Clean.
- Test results: Submit.
- Waterproof integrity certificate: On completion of testing, submit.

### **930 FLOOD TEST (If required)**

- Condition of roof prior to testing:
  - Sarnafil membrane complete to a stage where integrity can be tested.
- Outlets: Externally cover and seal. Protect against damage from water pressure using temporary kerbs. Do not use plugs to seal outlets.
- Flood levels: Submit proposals. In no case higher than kerbs.
- Flood duration: \_\_\_\_\_ days
- Inspection: Regular, to detect leaks.
- Completion of test: Slowly drain roof. Do not overload or flood outlets.
- Test results and warranty: Submit on completion of testing.

### **940A COMPLETION**

- Roof areas: Clean.
- Outlets: Clear.
- Work necessary to provide a weathertight finish: Complete.
- Storage of materials on finished surface: Not permitted.
- Completed membrane: Do not damage. Protect against damage from traffic and adjacent or high level working.
- Request the Sarnafil Guarantee.
- The roof has to be finally inspected by the Sika Roofing Applications Department and is to be to their satisfaction.

