APPLICATION MANUAL

Sarnafil® TG/TS – Sarnafil® G/S

BUILDING TRUST

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1 Sarnafil® TG/TS

GENERAL INFORMATION

GENERAL INFORMATION SIKA ROOFING

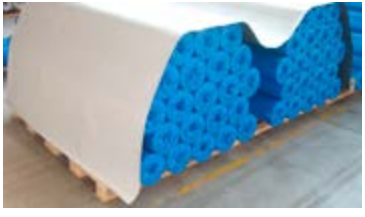
Sika Roofing is a world leader in polymeric waterproofing membranes and system solutions with more than 50 years of experience. Superior installation quality is vital to the long life of a roofing system. In order to ensure a high-quality roofing job, hands-on and theoretical training is required.


CERTIFICATE

Therefore Sika Roofing puts great emphasis on application training and offers a wide range of expert training courses.
Only those who have successfully completed one of the Sika Roofing training courses and have regular, practical site experience may install Sika Roofing systems.

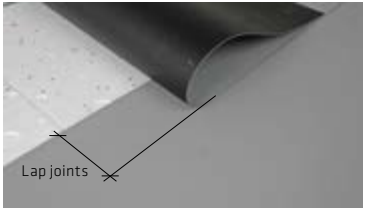
Watertight Seams
The intent of this application manual is to supplement the knowledge acquired during an application training course and to serve as an on-site reference.
The integrity of the waterproofing should be ensured by systematically following the procedures in the application manual.

GENERAL INFORMATION SIKA ROOFING



Storage of Sarnafil® Membranes
On the building site, Sarnafil® membranes must be protected against humidity, dirt, dust and exposure.

Cutting Sarnafil® Membranes
Cut Sarnafil® membranes with scissors or a knife.



Lap Joints
Adjoining Sarnafil® membranes are overlapped and hot-air welded to form a watertight seam.
The recommended membrane overlaps vary - between the roofing systems .
Details are found in the corresponding chapters of this application manual.

COMPATIBILITY

Sarnafil® TG/TS is resistant to environmental effects and various chemicals.
Sarnafil® TG/TS is suitable for installation directly on top of existing (old) bituminous roofing. In case of partitioned installations, Sarnafil® TG/TS is adhered directly on to the bituminous vapor barrier.
Cut Sarnafil® membranes with scissors or a knife.

Sarnafil® TG/TS may be installed on all types of thermal insulation, especially polystyrene (EPS/XPS) and levelling layers suitable for roofing.
No additional separation layer is required.
Based on national requirements, a fire protection layer may be required.

SEAM CLEANING AND SEAM PREPARATION

General
Sarnafil® TG/TS membranes must be prepared for welding.

During installation and in case of repair, different cleaning and seam preparation procedures may apply.

Procedure During Installation
- Every seam is prepared with Sarnafil® T Prep (yellow liquid).
- In case of slightly soiled membrane surface, Sarnafil® T Prep is used for both cleaning and the subsequent seam preparation.

Procedure During Repair
- Every seam is prepared with Sarnafil® T Prep (yellow liquid).
- For heavily soiled membrane surfaces, Sarnafil® T Clean (red liquid) must be used first.

Important:
Only heavily soiled surfaces should be cleaned with Sarnafil® T Clean as treating both sides of the seam overlap will impair seam quality. After cleaning, seam preparation with Sarnafil® T Prep (yellow liquid) must be carried out in any case.

General Rules
- The seam area must be clean and dry.
- The seam preparation must be done right before welding.
- During cleaning the cloths should be frequently changed, otherwise dirt will simply be spread over the sheet and not removed.
- A new white cleaning cloth should be used for seam preparation. White cloths will effectively absorb dirt and the color will not stain the membrane.
  Note:
  Sika Roofing offers suitable seam preparation kits. (e.g. Sarnafil® T WetTask-Set).

SEAM CLEANING AND SEAM PREPARATION

With Sarnafil® TG/TS, the seam area must be treated on both sides prior to welding.
For seam preparation and welding, the seam area must be clean and dry.

Cleaning and Seam preparation procedures Sarnafil® TG/TS

	Condition of Sarnafil® TG/TS	Steps to be taken in overlap area (both sides)
Installation Phase	■ Clean Sarnafil® TG/TS	■ Prepare seam areas using a clean cloth moistened with Sarnafil® T Prep ■ Allow Sarnafil® T Prep to dry
Utilization Phase	■ Slightly soiled Sarnafil® TG/TS (loose dust, dirt, bitumen residue)	■ Wipe off loose dirt ■ If necessary, wash down with water ■ Clean with Sarnafil® T Prep ■ Prepare seam using a clean cloth moistened with Sarnafil® T Prep ■ Allow Sarnafil® T Prep to dry
	■ Heavily soiled Sarnafil® TG/TS (repair work, extensions to existing membranes etc.)	■ Wipe off loose dirt ■ Clean with water-based, all-purpose cleaner using a brush or cleaning pad ■ Allow Sarnafil® T Clean to dry ■ Prepare seam using a clean cloth moistened with Sarnafil® T Prep ■ Allow Sarnafil® T Prep to dry

When repairing membranes the new Sarnafil® TG/TS should be laid underneath the existing roofing.

Note: When using cleaning fluids and the seam preparation agent, protective gloves must be worn.
Caution: Avoid all contact between Sarnafil® T Clean or Sarnafil® T Prep and polystyrene insulation boards!

Hand Welding Tools
The following tools are available to hand weld Sarnafil® TG/TS:

1 Hand welder Leister Triac AT/ST
2 20 mm wide welding nozzle for details
3 40 mm wide welding nozzle for straight welds
4 Pressure roller
5 Chamfer tool

The air outlet of the nozzle must be of uniform width and open over the entire width. The nozzle should be positioned so that it forms an airtight seal on to the neck of the hand welder.

The air intake slots must be open and free of dust (1). Remove accumulated dust and dirt with a brush or compressed air.

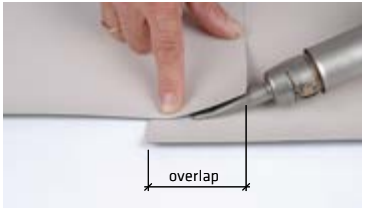
General
The temperature of the hand welder must be adjusted to suit the selected nozzle width and the particular type of welder.

Basic Settings for Sarnafil® TG and TS

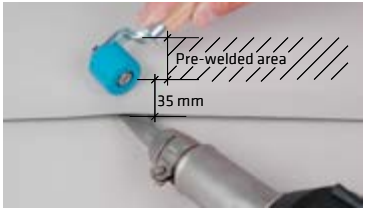
Hand Welder Leister	Nozzle 20 mm	Nozzle 40 mm
Triac AT	280 °C (on setting scale)	280 °C (on setting scale)
Triac ST	280 °C	280 °C

Higher settings must be avoided. They will impair seam quality.

HAND WELDING



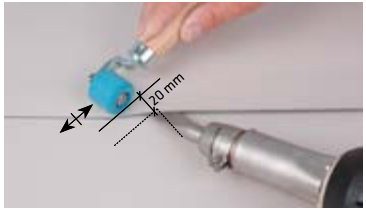
Hand welding procedure
When welding Sarnafil® TG/TS, the overlap area must be clean and dry.
Overlaps are required as follows:
- 80 mm for loose laid
- 80 mm for fully adhered



Hand welding is carried out in three steps:

1. Spot weld the overlap

2. Pre-weld
Weld the rear overlap area so that a 35 mm opening (when using 40 mm nozzle) remains for the final weld.



3. Final weld
Weld the 35 mm opening area. Guide the pressure roller at a distance of 20 mm parallel to the air outlet of the welding nozzle. Roll the pressure roller fully across the seam.

Attention:
Always perform a test weld.

Automatic Welding Machine
Sarnamatic® welding machines are available from Sika Roofing. For operation please refer to the operating manual delivered with the machine.
To weld Sarnafil® TG/TS thicker than 1.2 mm, the middle (2) and additional weight (3) need to be added to the main weight (1) of the welding machine (Sarnamatic® 661/681).

Attention:
The basic machine settings must be checked in any case by carrying out a test weld and by observing the welding pattern. Adjust the basic setting as required.

AUTOMATIC WELDING

General

The Sarnamatic® welding machine is delivered with a comprehensive operating manual.

The basic settings must be checked, and if necessary adjusted, by observing the welding pattern.

Please carry out test welding and seam checks.

Basic Settings for Sarnafil® TG and TS

	Sarnamatic® 681	Sarnamatic® 661
Speed	All data are pre-set	All data are pre-set
Temperature	All data are pre-set	All data are pre-set
Air setting	All data are pre-set	All data are pre-set

Before welding the actual roofing membrane, a test weld must be carried out to check the settings of the hand welder and/or the automatic welding machine. The test weld must be also carried out to check local site conditions during a working day.

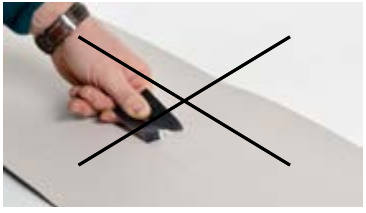
A test weld consists of:
a) Test welding with peel test
b) Seam check during test welding
c) Seam check after test welding

a) Test Weld with Peel Test
Before welding the actual roofing membrane, a test weld with subsequent peel test must be carried out.
This test welding serves to check the temperature settings of the hand welder or the basic settings of the automatic welding machine so that they can be adjusted to the site conditions if necessary.

1. Test welding
Carry out a test weld (automatic/manual).

2. Peel test across the seam
The welding seam must be fully cooled. Cut a small strip into the upper membrane. Pull away the strip of the upper membrane sheet across the seam. The seam must not separate. Any tearing must be located outside the welded seam, either in the synthetic sheeting (as shown) or within the layer of reinforcing material.

3. Peel test along the seam
Cut a small strip over the fully cooled welding seam at the beginning or end of the welding seam. Pull away the strip of the upper membrane in the direction of the seam. The seam must not separate. Any tearing must be located outside the welded seam, either in the synthetic sheeting (as shown) or within the layer of reinforcing material.



Incorrect peeling is an indication of insufficient cleaning and seam preparation or an incorrectly set welding machine or hand welder.

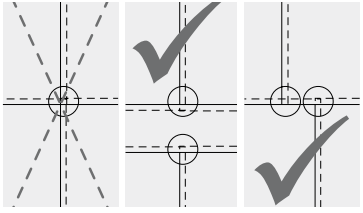
b) Seam Check During Test Welding
During welding the seam must be visually checked.

- **Size of the welding bead**
  A continuous, excessively large welding bead is an indication of an improperly welded seam.

c) Seam Check After Test Welding
After welding the seam should be visually checked.

- **Material discoloration**
  Black or brown discoloration in the weld overlap (visible when pulling away the upper sheet at the end of the seam) indicates that the welding temperature is too high or the welding speed is too slow.

WELDS AT TRANSVERSE JOINTS



By proper arrangement of Sarnafil® TG/TS, all seams can be reduced to straight welded seams and transverse joints (T Joint).

Cross joints are to be avoided!

To achieve proper welding, all transverse joints of all Sarnafil® TG/TS thickness, for manual and automatic welding have to be chamfered.

Weld the membrane over the chamfered area.

SEAM CHECK DURING WELDING

During welding the seam must be inspected visually (shiny surfaces, discoloration of the welding bead, size of welding bead).

- **Material discoloration**
  Black or brown next to or in the weld itself indicates that the welding temperature is too high or the welding speed is too slow.

- **Size of the welding bead**
  A continuous, excessively large welding bead is an indication of an improperly welded seam.

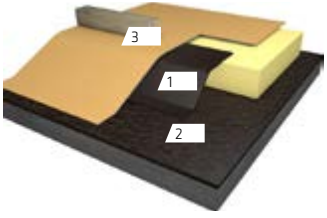
Formation of a Welding Bead During Automatic Welding
During the automatic welding process, the welding bead can be seen underneath the pressure roller. After the cooling-off period, little or no welding bead should remain with Sarnafil® TG/TS membrane.

Formation of a Welding Bead During Hand Welding
During hand welding the welding bead is more prominent and remains clearly visible after cooling.

SEAM CHECK AFTER WELDING

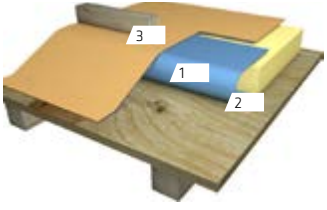
Mechanical Seam Check
All seams must be checked mechanically once they have completely cooled. For this purpose a screwdriver (approx. 5 mm wide, with rounded edges) should be used. Although slight pressure should be applied to the seam, the membrane must not be damaged.
The mechanical seam check assists in locating any seam areas not fully welded.

Visual Seam Check
After welding all seams should be inspected visually (shiny surfaces, size and quality of welding bead). Special attention should be paid to transverse joints, penetrations and flashings.



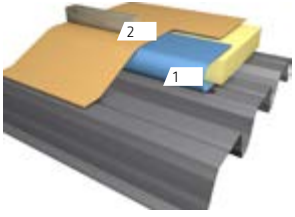
Day Joints to a Bituminous Vapor Control Layer

- Adhere the bituminous vapor control layer strip (1) to the installed vapor control layer (2).
- Put weight (3) on the Sarnafil® membrane.



Day Joints with Sarnavap® Vapor Control Layer on Top of a Level Deck

- Adhere the Sarnavap® vapor control layer (1) to the roof deck using a Sarnavap sealing tape (2).
- Fold back the Sarnavap® vapor control layer (1) over the thermal insulation.
- Put weight (3) on the Sarnafil® membrane.



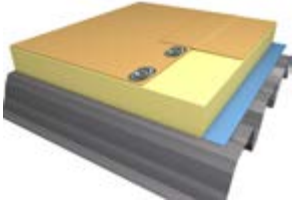
Day Joints with Sarnavap® Vapor Control Layer on Top of Profiled Metal Sheet

- Fold back the Sarnavap® vapor control layer (1) over the thermal insulation.
- Put weight (2) on the Sarnafil® membrane.

Remove the bituminous vapor control layer strip (1) on the next day before work starts.
Day joints protect flat roof areas against water penetration when work is interrupted.

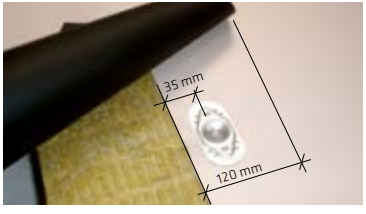
1 Sarnafil® TG/TS

MECHANICALLY FASTENED SYSTEM



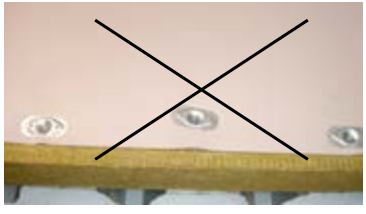
Fasten the thermal insulation boards with Sarnafast® Fastener and Insulation Washers. Use at least one fastener per insulation board or 1 m^2.

Orient Sarnafil® TS sheets perpendicular to the metal ribbing.



Sarnafil® TS is fastened using the Sarnafast® Fasteners and Sarnafast® Washers along the marked line 35 mm from the edge of the membrane. Space the fasteners in accordance with project specifications by Sika Roofing.

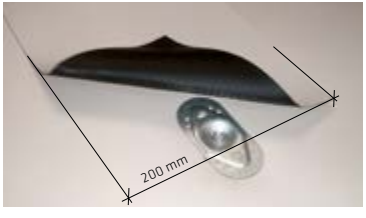
Unroll the next Sarnafil® TS membrane sheet, overlap by 120 mm along the marked line and weld.



Sarnafast® Fasteners and Sarnafast® Washers must be installed with the Sarnafast® automatic setting tool or by means of an electric screw-driver with depth guide.

Incorrect positioning and/or setting of Sarnafast® Fastener and Sarnafast® Washers will substantially reduce wind uplift resistance of the system.

Attention:
With correctly anchored Sarnafast® Fastener, the Sarnafast® Washer must be level with the Sarnafil® TS membrane.



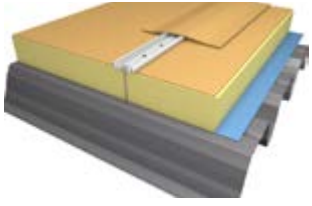
In perimeter and corner areas where additional fastening is required, Sarnafast® Fasteners and Sarnafast® Washers are installed through the membrane.

Cover the rows of Sarnafast® Fasteners with a 200 mm wide membrane cover strip and weld both sides.

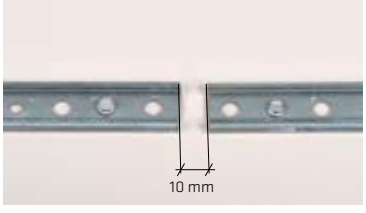
Space the fasteners in accordance with project specifications by Sika Roofing.

Important Notes:
- All Sarnafast® Fasteners must be fastened immediately after the Sarnafil® TS membrane has been installed. Failure to do so may result in permanent membrane deformation.
- All welding on the flat roofing must be carried out with the Sarnamatic® welding machine.
  Hand welding is only allowed for detail work.

Sarnabar® SYSTEM

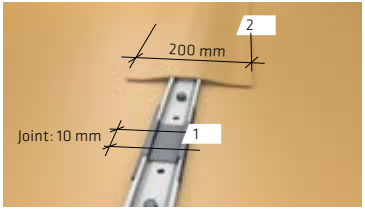


Before installing Sarnabar®, fasten the thermal insulation boards with Sarnafast® Fasteners and Insulation Washers. Use at least one fastener per insulation board or 1 m². In the Sarnabar® system, Sarnafil® TS membranes are used. Unroll the Sarnafil® TS membrane, overlap by 80 mm (min 60 mm), weld immediately and fasten to the substrate using Sarnabar®.



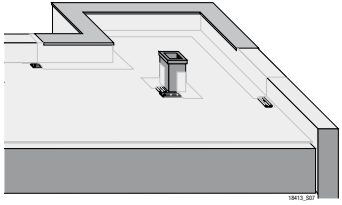
Leave a 10 mm clearance between bar ends. Do not fasten in hole nearest bar end.

The fastening pattern and type of fastener to be used will be specified by Sika Roofing. Sarnabar® must be installed perpendicular to the direction of the deck ribbing.

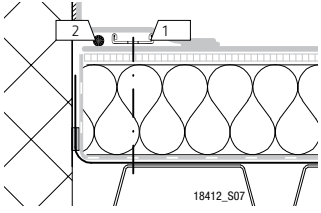


Cover the bar with the Sarnabar® Connection Clip (1). The installed Sarnabar® need to be immediately covered by a Sarnafil® membrane cover strip (2).

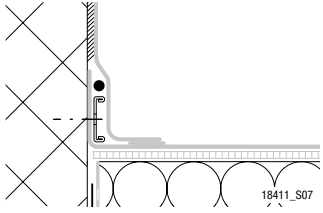
Important Note:
Use whenever possible the Sarnamatic® welding machine.



Perimeter Securement
All flashings, terminations and penetrations of mechanically fastened systems must be secured mechanically using Sarnabar®.



Securement in Roof Deck
The Sarnabar® must be anchored using suitable fasteners into the roof deck.
Sarnabar® types 6, 6/10, 6/15 (1) with at least 4 fasteners per meter must be used. In addition a Sarnafil® T Welding Cord of 4 mm diameter (2) must be welded to the side of the fastening bar facing towards the upstand.
The welding cord secures the membrane against tearing by thermal construction.



Securement in Upstand
The Sarnabar® can also be anchored into the transition area of the upstand by using suitable fasteners. If the roof structure in the upstand area is not strong enough (e.g. timber planking, aerated concrete, thin metal sheets, skylight frames etc.) the fastening may be anchored into the roof deck.

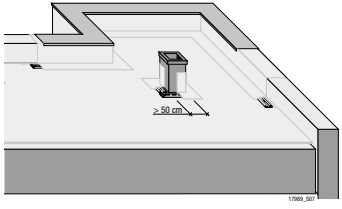
1 Sarnafil® TG/TS

BALLASTED SYSTEM

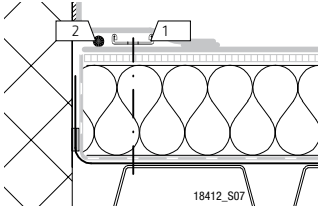
GENERAL INFORMATION

General Information
In ballasted roofing systems loose laid Sarnafil® TG membrane is used.
The membranes should be unrolled flat without waves or creases and be positioned to overlap by 80 mm.
The overlapping sheets must be welded immediately (on the same working day) and the loose laid Sarnafil® TG membrane ballasted as soon as possible.

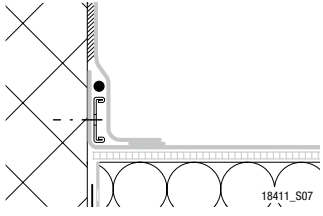
PERIMETER SECUREMENT



Perimeter Securement
All flashings, terminations and penetrations wider than 50 cm must be secured mechanically using Sarnabar®.



Securement in Roof Deck
The Sarnabar® must be anchored using suitable fasteners into the roof deck.
Sarnabar® types 6, 6/10, 6/15 (1) with at least 4 fasteners per meter must be used. In addition a Sarnafil® T Welding Cord of 4 mm diameter (2) must be welded to the side of the fastening bar facing towards the upstand. The welding cord secures the membrane against tearing by thermal construction.

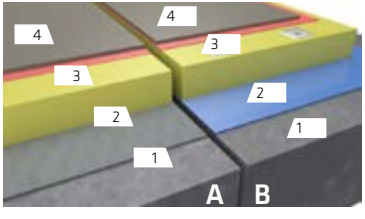


Securement in Upstand
The Sarnabar® can also be anchored into the transition area of the upstand by using suitable fasteners. If the roof structure in the upstand area is not strong enough (e.g. timber planking, aerated concrete, thin metal sheets, skylight frames etc.) the fastening may be anchored into the roof deck.

1 Sarnafil® TG/TS

ADHERED SYSTEM

GENERAL INFORMATION

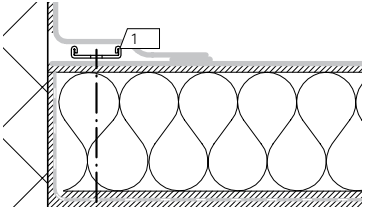


General Information
Sarnafil® TG Felt membranes can be adhered (fully or composite) to flat, curved or sloped roofs using the appropriate adhesive. Adjoining membrane sheets are overlapped by 80 mm and hot-air welded.

A Fully Adhered
1 Roof deck
2 Vapor control layer, adhered
3 Thermal insulation, adhered
4 Sarnafil® TG Felt, adhered

B Composite Adhered
1 Roof deck
2 Vapor control layer, loose laid or adhered
3 Thermal insulation, mechanically fastend
4 Sarnafil® TG Felt, adhered

PERIMETER SECUREMENT / PEEL STOP



Perimeter Securement / Peel stop
All flashings, terminations and penetrations in fully or composite adhered systems must be mechanically secured using Sarnabar® (peel stop).
Sarnabar® types 6, 6/10, 6/15 (1) with at least 4 fasteners per meter must be used without welding cord.
The Sarnabar® is anchored into the roof deck.

1 Sarnafil® TG/TS

ADHERING Sarnafil® TG FELT

ADHERING Sarnafil® TG 76 Felt WITH Sarnacol® 2142S

Sarnafil® TG 76 Felt can be adhered to flat, curved or sloped roofs using Sarnacol® 2142S adhesive.

Sarnacol® 2142S is a single-component PUR adhesive designed for adhering Sarnafil® TG 76 Felt membranes to standard insulations and roof substrates. Sarnacol® 2142S is not frost proof. It must be applied at temperatures between +5 °C and +40 °C. It is not necessary to stir Sarnacol® 2124S before use.

Adhering Sarnafil® TG 76 Felt using Sarnacol® 2142S is particularly suitable for refurbishing old bitumen membranes. It is not suitable for refurbishment over synthetic, rubber or ECB roofing. Apply the system only on slopes less than 10° or apply additional fastening measures.

Attention:
The safety of the existing roof assembly in terms of wind uplift must be ensured. Any insufficiently secured sections or components must be removed before starting to adhere Sarnafil® TG 76 Felt.

1. **Substrate preparation (refurbishment):**
- Clean with a broom
- Remove any oil and grease
- Cut open any blisters in the old bitumen layer and repair
- The curing of Sarnacol® 2142S requires moisture. The substrate layer may therefore be slightly moist (no puddles)

ADHERING Sarnafil® TG 76 Felt WITH Sarnacol® 2142S

2. Adhering
- Lay out and align Sarnafil® TG 76 Felt with the felt free edge along upstands
- From the end of the run, roll back Sarnafil® TG 76 Felt to approximately half way.
- Apply Sarnacol® 2142S with a roller evenly over the exposed substrate/surface. Very absorbent surfaces/substrates, e.g. mineral fiber, require two coats of adhesive. The first coat of approx. 250 – 550 g/m² must be completely dry before applying the second.

The curing time of Sarnacol® 2142S depends on humidity. The higher the humidity, the quicker the adhesive will set.
- Roll the membrane immediately onto the wet adhesive.
- Press down the Sarnafil® TG 76 Felt with a heavy roller (approx. 50 kg).
- Roll back the second half of the Sarnafil® TG 76 Felt membrane and repeat the procedure.
- Lay out the next Sarnafil® membrane sheet and align (butt joint or overlap joint of 80 mm).
- Adhere the second membrane sheet as described above.

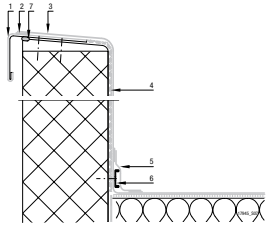
3. Welding
- Weld the adhered Sarnafil® TG 76 Felt sheets in overlap joints.
- Butt joints should be covered with a 100–200 mm wide Sarnafil® TG 66 cover strip welded on either side.

Attention:
Bonding strength is dependent on ambient temperature and air humidity. Ensure that the bond is sufficiently strong before welding.

4. Apply Peel Stop
All upstands, terminations and penetrations are mechanically secured using Sarnabar® (peel stop).

FLASHINGS

Mechanically Fastened Perimeter Flashing
Screw the fastening bar (Sarnabar®) over the Sarnafil® TG/TS, along the vertical or horizontal transition, either to the upstand or to the roof surface.
A levelling layer must be installed between Sarnafil® TG/TS and rough substrates. The number and type of fasteners per linear meter depend on the substrate and the wind load (pullout value). At least four fasteners per meter must be used. Fastener type, spacing and type of Sarnabar® must be in accordance with specifications by Sika Roofing.

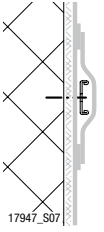


1 Sarnafil® TG/TS Metal Sheet
2 Hot air weld
3 Sarnafil® TG/TS membrane
4 Levelling/separation layer
5 Cover strip
6 Sarnabar®
7 S-Sealing tape

FLASHINGS

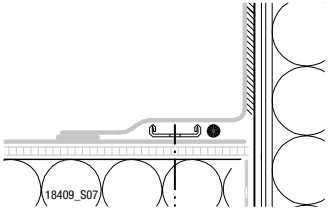
Mechanically Fastened Perimeter Flashing

- For parapet heights ≤ 400 mm Sarnafil® TG/TS is used. Additional fastening as described in following paragraph is not required.
- For parapet heights ≤ 800 mm Sarnafil® TS is used. Additional fastening as described in following paragraph is not required.
- For parapet heights > 800 mm Sarnafil® TS is used. Additional mechanical fastening is required.



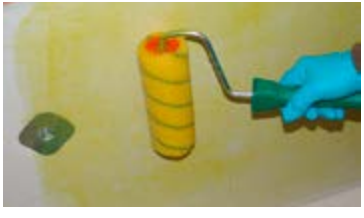
Additional fastening:
Sarnabar® must be attached with at least four fasteners per meter.

FLASHINGS



Fully Adhered Perimeter Flashing
Flashings are formed using strips of Sarnafil® TG membrane. The flashing strips are fully adhered to the upstand and welded to the roofing membrane.

Sarnafil® TG is adhered to substrate layers such as reinforced concrete, rendering, wood panels or metal sheets using Sarnacol® T 660 adhesive. The substrate layer must be solvent resistant, clean, dry and free of grease or dust. Thoroughly stir Sarnacol® T 660 before use. The container must be closed when work is interrupted. Sarnacol® T 660 can be diluted (max. 10%) with Solvent T 660. It must be used at temperatures between +5 °C and 40 °C.



Sarnacol® T 660 is applied evenly with a brush or roller to the substrate. Allow the adhesive to dry completely.
Absorbent substrates require two coats of adhesive. Allow the adhesive to dry completely before the second coating is applied. Allow an evaporation time of minimum 2 hours and maximum 10 hours. If Sarnacol® T 660 is allowed to dry for more than 10 hours, an additional coating of Sarnacol® T 660 is required.

Sarnacol® T 660 is also applied to the underside of the Sarnafil® TG membrane.
No adhesive must be applied within the welding area. Residual adhesive must be removed with Solvent T 660 and the clean surface then treated with Sarnafil® T Prep.

Finger Test:
Let Sarnacol® T 660 adhesive evaporate for about 30 minutes. The evaporation time on the membrane must be observed. At higher ambient temperatures a shorter evaporation time is possible.

After the solvent has evaporated place Sarnafil® TG on to the coated substrate layer and press down firmly, using a hand roller.

FLASHINGS

By heating the Sarnafil® TG membrane the adhesive can be re-activated so that a fully adhered bond with no air pockets is achieved even in corner and perimeter areas.

Caution:
No open flame on adhesive.
When heating the membrane avoid glazing the surface, particularly in the welding area.

SEALANTS AT FLASHINGS

General Information

- Use Sarnaplast® 2235.
- The surface must be clean, dry and free of dust and dirt.
- The surface must be primed before sealant is applied.

Sealing along Skylights

Apply Primer T 501 along the frame edge and the upper 20 mm of the Sarnafil® TG. Allow Primer T 501 to evaporate.

Form an angled bead of sealant using Sarnaplast® 2235.

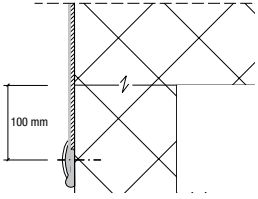
SEALANTS AT FLASHINGS

Sealing at Counter Flashings:
To achieve sealant bond on both faces of the joint, it is recommended that a backing rod (1) is installed.

Apply Primer 110 to contact areas (counter flashings, brickwork or plaster etc.). Allow primer to evaporate.

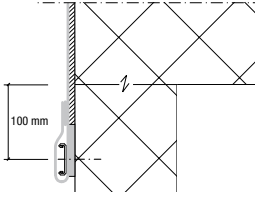
Apply Sarnaplast® 2235 on top of the backing rod (1) and strike bead to form a concave groove (2).

SEALANTS AT FLASHINGS



Sealant Packing with Perimeter Fastening

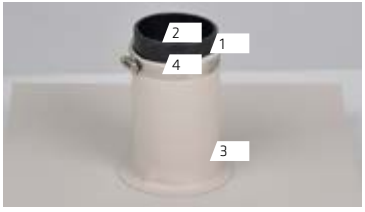
- The membrane should be pulled down at least 100 mm below the deck-to-wall joint.
- Adhere Sarnafil® TG using Sarnacol® T 660
- Apply Primer T 501 to the area to be sealed and allow evaporating.
- Apply Sarnaplast® 2235
- Mechanically fasten Sarnafil® TG over the packing using a fastening bar.



Alternative Application with Longer Membrane Sheets:

Follow procedure as before.

- Fold up the additional Sarnafil® TG membrane and weld.



Filler Packing at Jubilee Clips

Filler packing at jubilee clips (stainless steel) e.g. at penetration pipes.

- Prime the sealing area with Primer T 501 and allow evaporating.
- Insert Sarnaplast® 2235 (1) between the penetrating pipe (2) and the Sarnafil® TG membrane (3).
- Secure the Sarnafil® TG membrane (over the Sarnaplast® 2235 sealant) with a jubilee clip (4).

2 Sarnafil® G/S

GENERAL INFORMATION

GENERAL INFORMATION SIKA ROOFING

Sika Roofing is a world leader in polymeric waterproofing membranes and system solutions with more than 50 years of experience. Superior installation quality is vital to the long life of a roofing system. In order to ensure a high-quality roofing job, hands-on and theoretical training is required.


CERTIFICATE

Therefore Sika Roofing puts great emphasis on application training and offers a wide range of expert training courses.

Only those who have successfully completed one of the Sika Roofing training courses and have regular, practical site experience may install Sika Roofing systems.

Watertight Seams

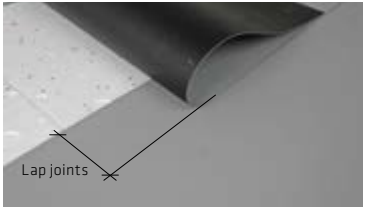
The intent of this application manual is to supplement the knowledge acquired during an application training course and to serve as an on-site reference.

The integrity of the waterproofing should be ensured by systematically following the procedures in the application manual.

GENERAL INFORMATION SIKA ROOFING

Storage of Sarnafil® Membranes
On the building site, Sarnafil® membranes must be protected against humidity, dirt, dust and exposure.

Cutting Sarnafil® Membranes
Cut Sarnafil® membranes with scissors or a knife.



Lap Joints
Adjoining Sarnafil® membranes are overlapped and hot-air welded to form a watertight seam.
The recommended membrane overlaps vary between the roofing systems.
Details are found in the corresponding chapters of this application manual.

COMPATIBILITY

Sarnafil® G/S is resistant to environmental effects and various chemicals.

However, Sarnafil® G/S membranes are not resistant to bitumen, tar, asphalt or oil. An appropriate separation layer must be installed. When these membranes are installed over polystyrene insulation boards, S-Glass Fleece 120 separation layer is required.

SEAM CLEANING

General
Sarnafil® G/S membrane supplied in the original packaging does not require welding preparation.

Dirty Sarnafil® G/S must be cleaned prior to welding.

Depending on the type of soiling, the membrane should be cleaned with water, a water-based general purpose cleaner, Sarna® Seam Cleaner or Sarna® Cleaner.

Areas cleaned with Sarna® Cleaner must be left to dry and the fluid allowed to evaporate completely.

SEAM CLEANING

The seam area must be clean and dry before welding.

Cleaning procedures Sarnafil® G/S

Condition of Sarnafil® G/S	Steps to be taken in overlap area (both sides)
■ Slightly soiled Sarnafil® G/S (loose drilling dust, building site dirt)	■ Wipe off loose dirt ■ If necessary, wash down with water
■ Heavily soiled Sarnafil® G/S (repair work, extensions to existing membrane etc.)	■ Wipe off loose dirt ■ Clean with water or all-purpose cleaner using a brush or cleaning pad ■ Remove heavy soiling with Sarna® Seam Cleaner or Sarna® Cleaner; allow Sarna® Cleaner to evoporate completely (blistering)
■ Plate-out (caused by storage at high temperature)	■ Treat greasy surface with Sarna® Seam Cleaner ■ Select lower temperatures for welding
■ Blistering due to moisture (regular diameter blisters)	■ Alow Sarnafil® G/S to dry ■ Weld slowly with as low a temperature as possible
■ Blistering due to solvent (regular diameter blisters)	■ When cleaning with solvent, weld Sarnafil® G/S immediately or allow solvent to evaporate completely ■ When using solvent-based adhesives weld immediately or wait approx. 7 hours before welding
■ Bitumen residue	■ Remove with Sarna® Seam Cleaner
■ Adhesive residue	■ Remove with Sarna® Cleaner; before welding allow areas cleaned with Sarna® Cleaner to evaporate completely (blistering)

When repairing membranes the new Sarnafil® G/S should be laid underneath the existing roofing.

Note: When using cleaning fluids protective gloves must be worn.
Caution: Avoid all contact between Sarna® Cleaner and polystyrene insulation boards.

Hand Welding Tools
The following tools are available to hand weld Sarnafil® G/S:

1 Hand welder Leister Triac AT/ST
2 20 mm wide welding nozzle for details
3 40 mm wide welding nozzle for straight welds
4 Pressure roller
5 Chamfer tool

The air outlet of the nozzle must be of uniform width and open over the entire width. The nozzle should be positioned so that it forms an airtight seal on to the neck of the hand welder.

The air intake slots must be open and free of dust (1). Remove accumulated dust and dirt with a brush or compressed air.

General
The temperature of the hand welder must be adjusted to suit the selected nozzle width and the particular type of welder.

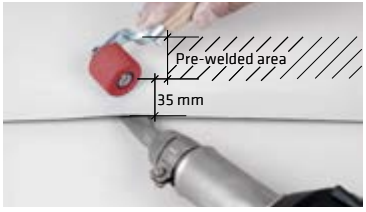
Basic Settings for Sarnafil® G and S

Hand Welder Leister	Nozzle 20 mm	Nozzle 40 mm
Triac AT	450 °C (on setting scale)	450 °C (on setting scale)
Triac ST	450 °C	450 °C
Triac S	450 °C	450 °C

Higher settings must be avoided. They will impair seam quality.

HAND WELDING

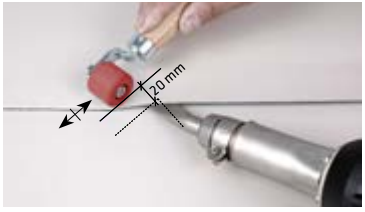
Hand welding procedure
When welding Sarnafil® G/S, the overlap area must be clean and dry.
Overlaps are required as follows:
- 80 mm for loose laid Sarnafil® G
- 80 mm for fully adhered Sarnafil® G 410 EL Felt
- 50 mm for fully adhered Sarnafil® G 410 EL



Hand welding is carried out in three steps:

1. Spot weld the overlap

2. Pre-weld
Weld the rear overlap area so that a 35 mm opening (when using 40 mm nozzle) remains for the final weld.



3. Final weld
Weld the 35 mm opening area. Guide the pressure roller at a distance of 20 mm parallel to the air outlet of the welding nozzle. Roll the pressure roller fully across the seam.

Attention:
Always perform a test weld.

Automatic Welding Machine
Sarnamatic® welding machines are available from Sika Roofing. For operation please refer to the operating manual delivered with the machine.
To weld Sarnafil® G/S thicker than 1.2 mm, the middle (2) and additional weight (3) need to be added to the main weight (1) of the welding machine (Sarnamatic® 661 / 681).

Attention:
The basic machine settings must be checked in any case by carrying out a test weld and by observing the welding pattern. Adjust the basic setting as required.

AUTOMATIC WELDING

General
The Sarnamatic® welding machine is delivered with a comprehensive operating manual.

The basic settings must be checked, and if necessary adjusted, by observing the welding pattern.

Please carry out test welding and seam checks.

Basic Settings for Sarnafil® G and S

	Sarnamatic® 681	Sarnamatic® 661
Speed	All data are pre-set	All data are pre-set
Temperature	All data are pre-set	All data are pre-set
Air setting	All data are pre-set	All data are pre-set

TEST WELDS

Before welding the actual roofing membrane, a test weld must be carried out to check the settings of the hand welder and/or the automatic welding machine. The test weld must be also carried out to check local site conditions during a working day.

A test weld consists of:
a) Test welding with peel test
b) Seam check during test welding
c) Seam check after test welding

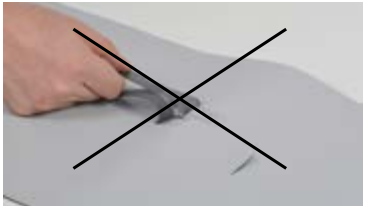
a) Test Weld with Peel Test
Before welding the actual roofing membrane, a test weld with subsequent peel test must be carried out.
This test welding serves to check the temperature settings of the hand welder or the basic settings of the automatic welding machine so that they can be adjusted to the site conditions if necessary.

1. Test welding
Carry out a test weld (automatic /manual).

2. Peel test across the seam
The welding seam must be fully cooled. Cut a small strip into the upper membrane. Pull away the strip of the upper membrane sheet across the seam. The seam must not separate. Any tearing must be located outside the welded seam, either in the synthetic sheeting (as shown) or within the layer of reinforcing material.

TEST WELDS

3. Peel test along the seam
Cut a small strip over the fully cooled welding seam at the beginning or end of the welding seam. Pull away the strip of the upper membrane in the direction of the seam. The seam must not separate. Any tearing must be located outside the welded seam, either in the synthetic sheeting (as shown) or within the layer of reinforcing material.



Incorrect peeling is an indication of insufficient cleaning and seam preparation or an incorrectly set welding machine or hand welder.

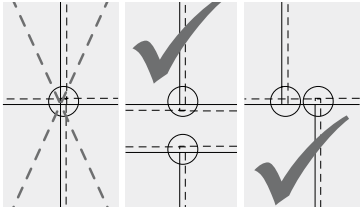
b) Seam Check During Test Welding
During welding the seam must be visually checked.

- **Size of the welding bead**
  A continuous, excessively large welding bead is an indication of an improperly welded seam.

c) Seam Check After Test Welding
After welding the seam should be visually checked.

- **Material discoloration**
  Black or brown discoloration in the weld overlap (visible when pulling away the upper sheet at the end of the seam) indicates that the welding temperature is too high or the welding speed is too slow.

TRANSVERSE JOINTS



By proper arrangement of Sarnafil® G/S, all seams can be reduced to straight welded seams and transverse joints (T-Joint).

Cross joints are to be avoided!

To achieve proper welding, Sarnafil® G/S with thicknesses of 1.8 mm and more must be chamfered in the area of transverse joint (T-joint).

Weld the membrane over the chamfered area.

SEAM CHECK DURING WELDING

During welding the seam must be inspected visually (smoke, shiny surfaces, discoloration of the welding bead, size of welding bead).

- **Material discoloration**
  Black or brown discoloration next to or in the weld itself indicates that the welding temperature is too high or the welding speed is too slow.

- **Size of the welding bead**
  A continuous, excessively large welding bead is an indication of an improperly welded seam.

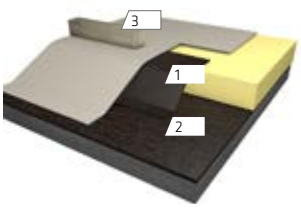
Formation of a Welding Bead During Automatic Welding
During the automatic welding process, the welding bead extrusion can be seen underneath the pressure roller. After the cooling-off period, a clearly visible welding bead should remain with Sarnafil® G/S membrane.

Formation of a Welding Bead During Hand Welding
During hand welding the welding bead is more prominent and remains clearly visible after cooling.

SEAM CHECK AFTER WELDING

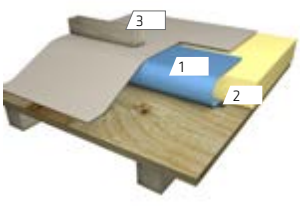
Mechanical Seam Check
All seams must be checked mechanically once they have completely cooled. For this purpose a screwdriver (approx. 5 mm wide, with rounded edges) should be used. Although slight pressure should be applied to the seam, the membrane must not be damaged.
The mechanical seam check assists in locating any seam areas not fully welded.

Visual Seam Check
After welding all seams should be inspected visually (shiny surfaces, size and quality of welding bead). Special attention should be paid to transverse joints, penetrations and flashings.



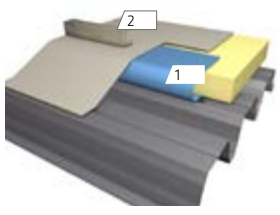
Day Joints to a Bituminous Vapor Control Layer

- Adhere the bituminous vapor control layer strip (1) to the installed vapor control layer (2).
- Put weight (3) on the Sarnafil® membrane.



Day Joints with Sarnavap® Vapor Control Layer on Top of a Level Deck

- Adhere the Sarnavap® vapor control layer (1) to the roof deck using a Sarnavap® sealing tape (2).
- Fold back the Sarnavap® vapor control layer (1) over the thermal insulation.
- Put weight (3) on the Sarnafil® membrane.



Day Joints with Sarnavap® Vapor Control Layer on Top of Profiled Metal Sheet

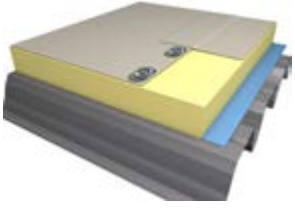
- Fold back the Sarnavap® vapor control layer (1) over the thermal insulation.
- Put weight (2) on the Sarnafil® membrane.

Remove the bituminous vapor control layer strip (1) on the next day before work starts.
Day joints protect flat roof areas against water penetration when work is interrupted.

2 Sarnafil® G/S

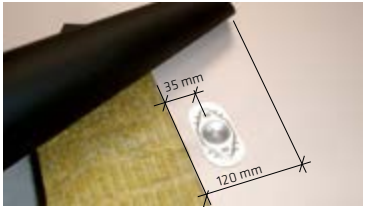
MECHANICALLY FASTENED SYSTEM

Sarnafast® SYSTEM



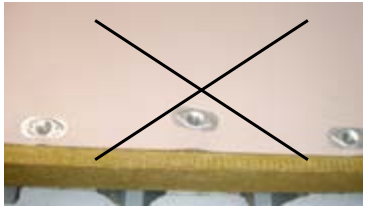
Fasten the thermal insulation boards with Sarnafast® Fastener and Insulation Washers. Use at least one fastener per insulation board or 1 m^2.

Orient Sarnafil® S sheets perpendicular to the metal ribbing.



Sarnafil® S is fastened using the Sarnafast® Fasteners and Sarnafast® Washers along the marked line 35 mm from the edge of the membrane. Space the fasteners in accordance with project specifications by Sika Roofing.

Unroll the next Sarnafil® S membrane sheet, overlap by 120 mm along the marked line and weld.

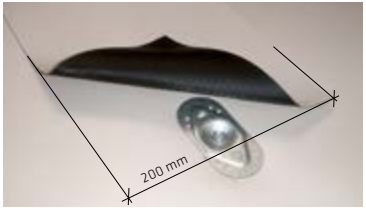


Sarnafast® Fasteners and Sarnafast® Washers must be installed with the Sarnafast® automatic setting tool or by means of an electric screw-driver with depth guide.

Incorrect positioning and/or setting of Sarnafast® Fastener and Sarnafast® Washers will substantially reduce wind uplift resistance of the system.

Sarnafast® SYSTEM

Attention:
With correctly anchored Sarnafast® Fastener, the Sarnafast® Washer must be level with the Sarnafil® TS membrane.



In perimeter and corner areas where additional fastening is required, Sarnafast® Fasteners and Sarnafast® Washers are installed through the membrane.

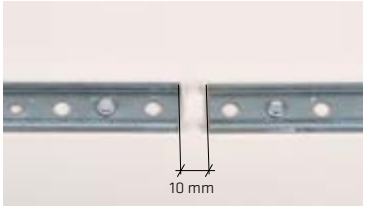
Cover the rows of Sarnafast® Fasteners with a 200 mm wide membrane cover strip and weld both sides.

Space the fasteners in accordance with project specifications by Sika Roofing.

Important Notes:
- All Sarnafast® Fasteners must be fastened immediately after the Sarnafil® S membrane has been installed. Failure to do so may result in permanent membrane deformation.
- All welding on the flat roofing must be carried out with the Sarnamatic® welding machine.
  Hand welding is only allowed for detail work.

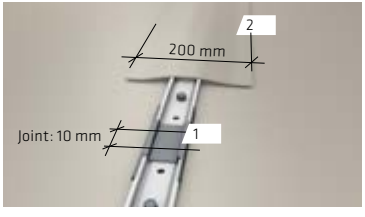
Sarnabar® SYSTEM

Before installing Sarnabar®, fasten the thermal insulation boards with Sarnafast® Fasteners and Insulation Washers. Use at least one fastener per insulation board or 1 m².
In the Sarnabar® system, Sarnafil® S membranes are used. Unroll the Sarnafil® S membrane, overlap by 80 mm, weld immediately and fasten to the substrate using Sarnabar®.



Leave a 10 mm clearance between bar ends. Do not fasten in hole nearest bar end.

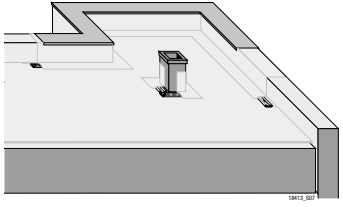
The fastening pattern and type of fastener to be used will be specified by Sika Roofing. Sarnabar® must be installed perpendicular to the direction of the deck ribbing.



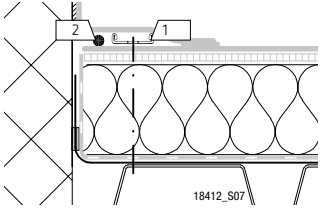
Cover the bar with the Sarnabar® Connection Clip (1). The installed Sarnabar® need to be immediately covered by a Sarnafil® membrane cover strip (2).

Important Note:
Use whenever possible the Sarnamatic® welding machine.

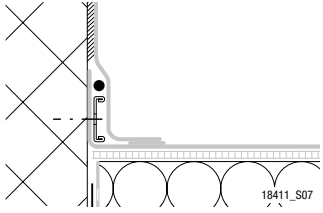
PERIMETER SECUREMENT



Perimeter Securement
All flashings, terminations and penetrations of mechanically fastened systems must be secured mechanically using Sarnabar®.



Securement in Roof Deck
The Sarnabar® must be anchored using suitable fasteners into the roof deck.
Sarnabar® types 6, 6/10, 6/15 (1) with at least 4 fasteners per meter must be used.
In addition a SikaRoof® Welding Cord PVC of 4 mm diameter (2) must be welded to the side of the fastening bar facing towards the upstand. The welding cord secures the membrane against tearing by wind uplift.

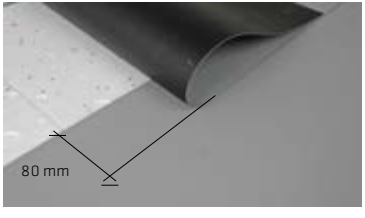


Securement in Upstand
The Sarnabar® can also be anchored into the transition area of the upstand by using suitable fasteners. If the roof structure in the upstand area is not strong enough (e.g. timber planking, aerated concrete, thin metal sheets, skylight frames etc.) the fastening may be anchored into the roof deck.

2 Sarnafil® G/S

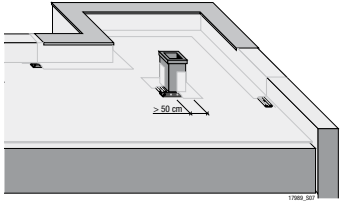
BALLASTED SYSTEM

GENERAL INFORMATION

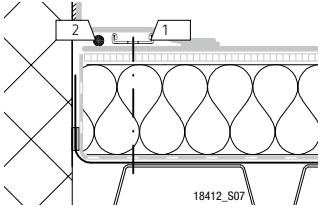


General Information
In ballasted roofing systems loose laid Sarnafil® G membrane is used.
The membranes should be unrolled flat without waves or creases and be positioned to overlap by 80 mm.
The overlapping sheets must be welded immediately (on the same working day) and the loose laid Sarnafil® G membrane ballasted as soon as possible.

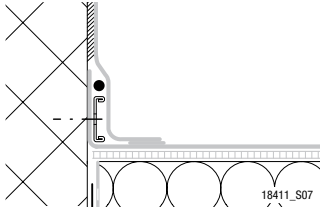
PERIMETER SECUREMENT



Perimeter Securement
All flashings, terminations and penetrations wider than 50 cm must be secured mechanically using Sarnabar®.



Securement in Roof Deck
The Sarnabar® must be anchored using suitable fasteners into the roof deck.
Sarnabar® types 6, 6/10, 6/15 (1) with at least 4 fasteners per meter must be used.
In addition a SikaRoof® Welding Cord PVC of 4 mm diameter (2) must be welded to the side of the fastening bar facing towards the upstand. The welding cord secures the membrane against tearing by thermal construction.

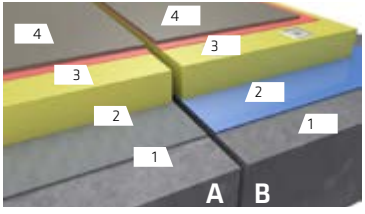


Securement in Upstand
The Sarnabar® can also be anchored into the transition area of the upstand by using suitable fasteners. If the roof structure in the upstand area is not strong enough (e.g. timber planking, aerated concrete, thin metal sheets, skylight frames etc.) the fastening may be anchored into the roof deck.

2 Sarnafil® G/S

ADHERED SYSTEM

GENERAL INFORMATION



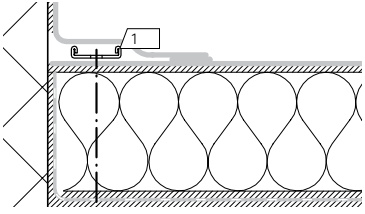
General Information
Sarnafil® G Felt membranes can be adhered (fully or composite) to flat, curved or sloped roofs using the appropriate adhesive. Adjoining membrane sheets are overlapped by 80 mm and hot-air welded.

A Fully Adhered
1 Roof deck
2 Vapor control layer, adhered
3 Thermal insulation, adhered
4 Sarnafil® G Felt, adhered

B Composite Adhered
1 Roof deck
2 Vapor control layer, loose laid or adhered
3 Thermal insulation, mechanically fastend
4 Sarnafil® G Felt, adhered

ADHERED SYSTEM

PERIMETER SECUREMENT / PEEL STOP



Perimeter Securement / Peel stop
All flashings, terminations and penetrations in fully or composite adhered systems must be mechanically secured using Sarnabar® (peel stop).
Sarnabar® types 6, 6/10, 6/15 (1) with at least 4 fasteners per meter must be used without welding cord.
The Sarnabar® is anchored into the roof deck.

2 Sarnafil® G/S

ADHERING Sarnafil® G/G FELT

Adhesive		
Membrane	**Sarnacol® 2142S**	**Sarnacol® 2170**
Sarnafil® G 410 EL	–	x
Sarnafil® G 410 EL Felt	x	x

General Information
Sarnafil® G or G 410 EL Felt can be adhered to flat, curved or sloped roofs using Sarnacol® adhesives.
Sarnacol® 2142S is a single-component PUR adhesive designed for adhering Sarnafil® G Felt membranes to standard insulations and roof substrates. Sarnacol® 2142S is not frost proof. It must be used at temperatures between +5 °C and +40 °C. It is not necessary to stir Sarnacol® 2142S before use.
Sarnacol® 2170 is a solvent based contact adhesive designed for adhering Sarnafil® G 410 EL or G 410 EL Felt to roof substrates. It must be used at temperatures between +5 °C and +40 °C.

Sarnafil® G 410 EL Felt adhered with Sarnacol® 2142S
Adhering Sarnafil® G 410 EL Felt using Sarnacol® 2142S is particularly suitable to refurbish old bitumen membranes. It is not suitable for refurbishment over synthetic, rubber or ECB roofing. Apply the system only on slopes less than 10° or apply additional fastening measures. It must be used at temperatures between +5 °C and +40 °C.

1. **Substrate preparation (refurbishment):**
- Clean with a broom
- Remove any oil and grease
- Cut open any blisters in the old bitumen layer and repair
- The curing of Sarnacol® 2142S requires moisture. The substrate layer may therefore be slightly moist (no puddles)

Attention:
The safety of the existing roof assembly in terms of wind uplift must be ensured. Any insufficiently secured sections or components must be removed to provide a smooth surface.

ADHERING Sarnafil® TG 76 Felt WITH Sarnacol® 2142S

2. Adhering
- Lay out and align Sarnafil® G 410 EL Felt with the felt-free edge along upstands
- From the end of the run, roll back Sarnafil® G 410 EL Felt to approximately half way.
- Apply Sarnacol® 2142S with a roller evenly over the exposed substrate/surface. Very absorbent surfaces/substrates, e.g. mineral fiber, require two coats of adhesive. The first coat of approx 300 g/m² must be completely dry before applying the second.

The curing time of Sarnacol® 2142S depends on humidity. The higher the humidity, the quicker the adhesive will set.
- Roll the membrane immediately onto the wet adhesive.
- Press down the Sarnafil® G 410 EL Felt with a heavy roller (approx 50 kg).
- Roll back the second half of the Sarnafil® G 410 EL Felt membrane and repeat the procedure.
- Lay out the next Sarnafil® membrane sheet and align (butt joint or overlap joint of 80 mm).
- Adhere the second membrane sheet as described above.

3. Welding
- Weld the adhered Sarnafil® G 410 EL Felt sheets in overlap joints.
- Butt joints should be covered with a 100–200 mm wide Sarnafil® G cover strip welded on either side.
  Attention: Bonding strength is dependent on ambient temperature and air humidity. Ensure that the bond is sufficiently strong before welding.

4. Apply Peel Stop
All upstands, terminations and penetrations are mechanically secured using Sarnabar® (peel stop).

Sarnafil® 410 EL Felt ADHERED WITH Sarnacol® 2170

1. Prepare Substrate
- Clean with a broom
- Remove any oil and grease

2. Adhering

Apply Sarnacol® 2170 only to solvent resistant, dust-free surfaces.
- Use a Sarnafil® roller to apply a priming coat of Sarnacol® 2170 on the roof surface and allow complete drying.

- Lay out Sarnafil® G 410 EL Felt, align and roll back to approximately half its length.
- Apply a second coat of Sarnacol® 2170 to the roof surface.
- Roll Sarnafil® G 410 EL Felt immediately onto the wet Sarnacol® 2170 and press down using a heavy roller (approx 50 kg).
- Fold back the second half of the membrane and repeat the procedure.
- Lay out the next Sarnafil® membrane sheet and align (butt joint or overlap joint). Overlap by 80 mm
- Adhere the second membrane sheet as described above.

3. Welding
- Weld the membranes immediately or later than 7 hours after the adhesive has been applied.
- Butt joints should be covered with a 100–200 mm wide Sarnafil® G cover strip welded on either side.

4. Apply Peel Stop

All upstands, terminations and penetrations are mechanically secured using Sarnabar® (peel stop).

Sarnafil® 410 EL ADHERED WITH Sarnacol® 2170

1. Prepare Substrate
- Clean with a broom
- Remove any oil and grease

2. Adhering
Apply Sarnacol® 2170 only to solvent resistant, dust-free surfaces.
- Use a roller to apply a priming coat of Sarnacol® 2170 to the roof surface. On absorbent surfaces it is recommended that a second coat be applied.

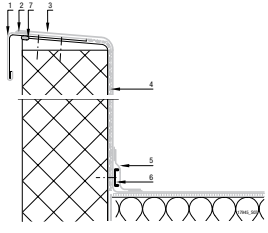
Allow the Sarnacol® 2170 to dry completely. Prime only that area of the roofing where membrane will be laid out on the same day.
- Lay out Sarnafil® G 410 EL, align and fold back to approximately half its length.
- Apply Sarnacol® 2170 to the folded back membrane and allow to dry (finger test). Depending on the ambient temperature, apply adhesive in stages. Areas to be welded must be kept free of adhesive.
- Carefully fold back Sarnafil® G 410 EL and press down using a heavy roller (approx. 50 kg).
- Fold back the second half and repeat as above.
- Lay out the next Sarnafil® membrane sheet and align. Overlap by 50 mm
- Adhere the second membrane sheet as described above.

3. Welding
Weld the membranes immediately or later than 7 hours after the adhesive has been applied.

4. Apply Peel Stop
All upstands, terminations and penetrations are mechanically secured using Sarnabar® (peel stop).

FLASHINGS

Mechanically Fastened Perimeter Flashing
Screw the fastening bar (Sarnabar®) over the Sarnafil® G/S, along the vertical or horizontal transition, either to the upstand or the roof surface.
A levelling/separation layer must be installed between Sarnafil® G/S and rough or bituminous substrates. The number and type of fasteners used per linear meter depend on the substrate and the wind load (pullout value). At least four fasteners per meter must be used. Fastener type, spacing and type of Sarnabar® must be in accordance with specifications by Sika Roofing.

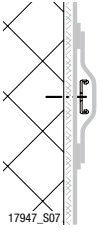


1 Sarnafil® G/S Metal Sheet
2 Hot air weld
3 Sarnafil® G/S membrane
4 Levelling/separation layer
5 Cover strip
6 Sarnabar®
7 S-Sealing tape

FLASHINGS

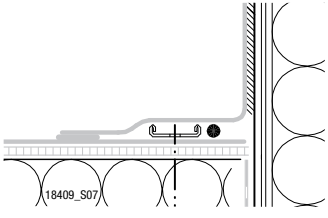
Mechanically Fastened Perimeter Flashing

- For parapet heights ≤ 400 mm
  Sarnafil® G/S is used.
  Additional fastening as described in following paragraph is not required.
- For parapet heights ≤ 800 mm
  Sarnafil® S is used.
  Additional fastening as described in following paragraph is not required.
- For parapet heights > 800 mm
  Sarnafil® S is used.
  Additional mechanical fastening is required.



Additional fastening:
Sarnabar® must be attached with at least four fasteners per meter.

FLASHINGS

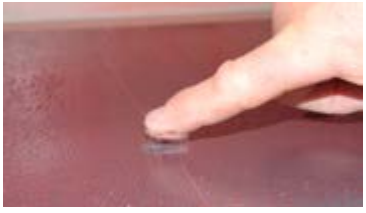


Fully Adhered Perimeter Flashing
Flashings are formed using strips of Sarnafil® G membrane. The flashing strips are fully adhered to the upstand and welded to the roofing membrane.

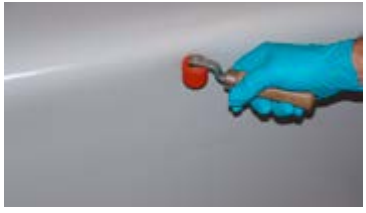
Sarnafil® G is adhered to substrate layers such as reinforced concrete, rendering, wood panels, metal sheets etc. using Sarnacol® 2170 adhesive. The substrate layer must be solvent resistant, clean, dry and free of grease and dust. Thoroughly stir Sarnacol® 2170 before use. The container must be closed when work is interrupted. Sarnacol® 2170 may be diluted with Sarna® Cleaner (max. 10%).

Sarnacol® 2170 is applied evenly with a brush or roller to the substrate layer. Allow the adhesive to dry completely.
Absorbent substrates require two coats of adhesive.
The adhesive must be allowed to dry completely before the second layer is applied.

Sarnacol® 2170 is also applied to the underside of Sarnafil® G membrane. No adhesive must be applied within the welding area. Residual adhesive must be removed with Sarna® Cleaner.



Finger Test:
Let the Sarnacol® 2170 adhesive completely evaporate.
The evaporation time depends largely on the weather conditions, the substrate layer itself and the amount of adhesive applied.



After the solvent has evaporated, place Sarnafil® G on to the coated substrate layer and press down firmly, using a hand roller.

FLASHINGS

By heating the Sarnafil® G membrane, the adhesive can be re-activated so that a fully adhered bond with no air pockets is achieved even in corner and perimeter areas.

Caution:
No open flame on adhesive.

SEALANTS AT FLASHINGS

General Information

- Use Sarnaplast® 2235.
- The surface must be clean, dry and free of dust and dirt.
- The surfaces must be primed before sealant is applied.

Sealing around Skylights

Apply Primer 110 along the frame edge and allow to evaporate.

Form an angled bead of sealant using Sarnaplast® 2235.

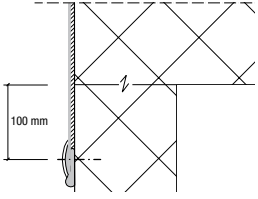
SEALANTS AT FLASHINGS

Sealing at Counter Flashings:
To achieve sealant bond on both faces of the joint, it is recommended that a backing rod (1) is installed.

Apply Primer 110 to contact areas (counter flashings, brickwork or plaster etc.). Allow Primer 110 to evaporate.

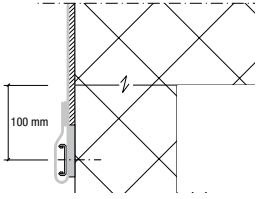
Apply Sarnaplast® 2235 on top of the backing rod (1) and strike bead to form a concave groove (2).

SEALANTS AT FLASHINGS



Sealant Packing with Perimeter Fastening

- The membrane should be pulled down at least 100 mm below the deck-to-wall joint.
- Adhere Sarnafil® G using Sarnacol® 2170
- Apply Primer 110 to the area to be sealed and allow to evaporate
- Apply Sarnaplast® 2235
- Mechanically fasten Sarnafil® G over the packing using a fastening bar.



Alternative Application with Longer Membrane Sheets:

Follow procedure as before.

- Fold up the additional Sarnafil® G membrane and weld.

Filler Packing at Jubilee Clips

Filler packing at jubilee clips (stainless steel) e.g. at penetration pipes.

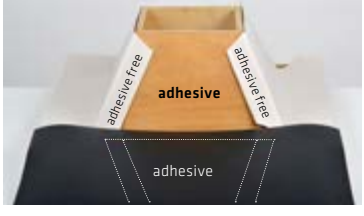
- Prime the sealing area with Primer 110 and allow to evaporate.
- Insert Sarnaplast® 2235 (1) between the penetrating pipe (2) and the Sarnafil® G membrane (3).
- Secure the Sarnafil® G membrane (over the Sarnaplast® 2235 sealant) with a jubilee clip (4).

3 Detailing

DETAILS

Material
For roofing details the stretchable unreinforced Sarnafil® G or Sarnafil® TG membrane must be used.

Welding
Use a hand welder with 20 mm nozzle for detail work.
To form Sarnafil® G or Sarnafil® TG membrane for detailing work, the membrane can be evenly warmed up at the edge and stretched manually.

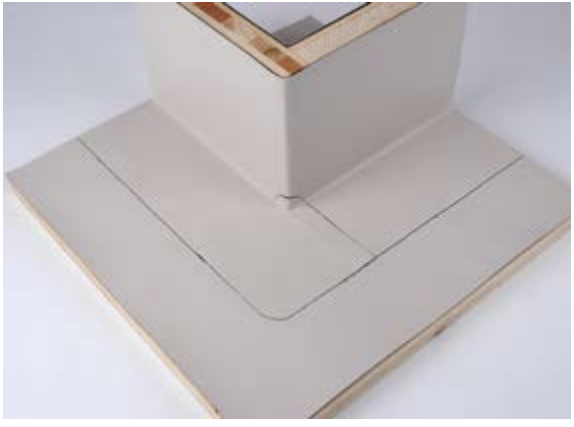


Adhesive Application
Do not apply adhesive to welding areas.
Allow contact adhesive to evaporate before adhering the membrane (finger test).

DETAILS

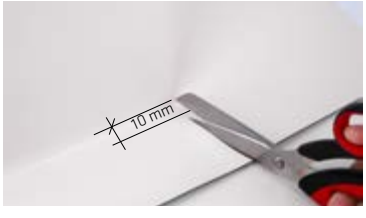
1 OUTSIDE CORNER WITH FLASHING STRIPS

COMPLETE OUTSIDE CORNER FLASHING WITH HANDMADE FLANGE



1 OUTSIDE CORNER WITH FLASHING STRIPS

Coat the substrate with adhesive (Sarnacol®).
- Apply adhesive (Sarnacol®) to the Sarnafil® G/TG flashing strip.
- Allow the adhesive to evaporate (finger test).
- Adhere the flashing strip to the tack-dry adhesive bed.



- Cut the membrane overlap in line with the corner. Stop 10 mm short of the corner.

- Activate the adhesive (Sarnacol®) with the hand welder.

1 OUTSIDE CORNER WITH FLASHING STRIPS

- Adhere the flashing strip around the corner without creasing.
- Spot weld the overlap to the roofing membrane.

- Finish weld the overlap to the roofing membrane.

- Cut a square corner patch of membrane.
- The size should be approx. 50 mm larger than the corner area to cover.
- Round off the patch corner, that is to be positioned at the vertical edge.

1 OUTSIDE CORNER WITH FLASHING STRIPS

– Heat and stretch the rounded corner.

– Spot weld the whole corner patch.

– Cut the corner patch so that it is aligned with the overlap of the Sarnafil® flashing strip.

1 OUTSIDE CORNER WITH FLASHING STRIPS

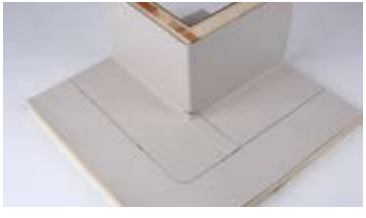
- Round off the protruding corner.
- Weld the upstanding rounded corner:
- Start at the bottom and weld upwards along the vertically standing corner patch on the lap area.

- Weld both sides of the upstanding rounded corner ...

- ... and press down the welded corner with the finger tip.

1 OUTSIDE CORNER WITH FLASHING STRIPS

- Weld the remaining sides of the patch.

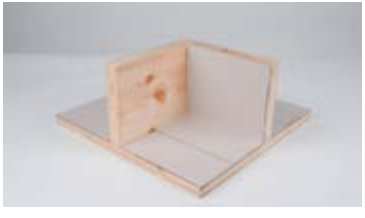


- Mechanically check the welds.

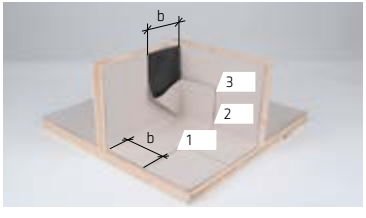
2 INSIDE CORNER WITH UPRIGHT CREASE

INSIDE CORNER WITH AN UPRIGHT CREASE

2 INSIDE CORNER WITH UPRIGHT CREASE



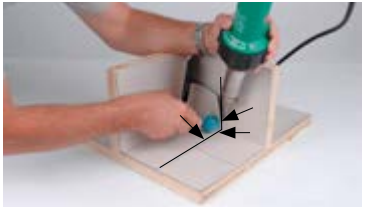
- Cut the first Sarnafil® flashing strip to fit.
- Coat the upstand with adhesive (Sarnacol®).
- Apply adhesive (Sarnacol®) to the flashing strip.
- Allow the adhesive to evaporate (finger test).
- Adhere the flashing strip to the tack-dry surface.
- Weld the overlap to the roofing membrane adhesive bed.



- Cut and adhere the second flashing strip to the upstand so that overlap “b” measures the same on the roof surface as in the corner. An upright crease is thus formed.
- Spot weld the Sarnafil® flashing strip in 3 spots (1–3).

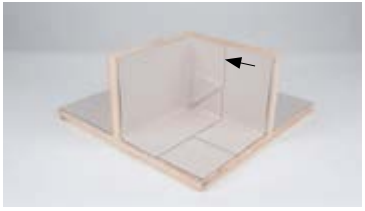
- Weld the crease shut to a closed pocket. Work from the inside towards the front edge.

2 INSIDE CORNER WITH UPRIGHT CREASE



- Weld the second Sarnafil® flashing strip to the overlap area.

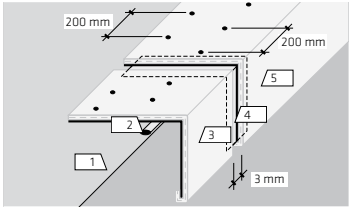
- Starting from the upright corner area, weld the closed pocket to the membrane upstand (pre-weld and final weld).



- Complete by welding the overlapping area.
- Mechanically check the weld.

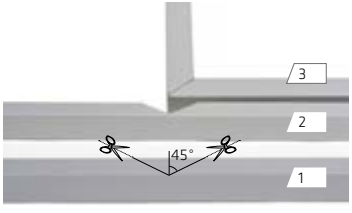
ROOF TRIM WITH METAL SHEET (Sarnafil® T OR Sarnafil® G/S METAL SHEET)

3 ROOF TRIM



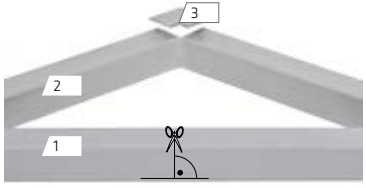
Longitudinal joint metal sheet

- Fix the metal sheet (3) and riveted connecting plate (4) to the substrate with screws set in two rows, staggered. Screw spacing within rows is 200 mm.
- Make sure that an S-Sealing tape (2) is installed under the metal sheet to ensure a waterproof joint between the wall and the metal sheet.
- Slide on the next metal sheet (5) and fasten to the parapet top (1) as shown. The open butt joint between the two pieces should measure 3 mm.



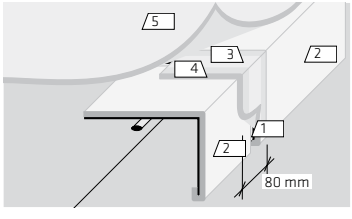
Cut the metal sheet to fit an inside corner

- Mark miter on the metal sheet (1).
- Cut metal sheet to size as shown (2) (45°).
- Bend the metal sheet to fit the corner (3) and fix to the substrate.
- Weld the crease shut to a closed pocket. Work from the inside towards the front edge.



Cut the metal sheet to fit an outside corner

- Mark miter at right angles and cut open (1).
- Bend the metal sheet (2) and screw to the substrate.
- Cover the exposed area of the corner by slipping a piece of metal sheet (3) underneath the metal sheet (2).



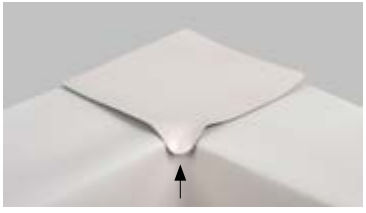
Longitudinal joint completed after the metal sheets are fixed

1 Connecting plate
2 Metal sheet
3 Adhesive tape
4 Sarnafil® membrane strip (80 mm)
5 Sarnafil® flashing strip

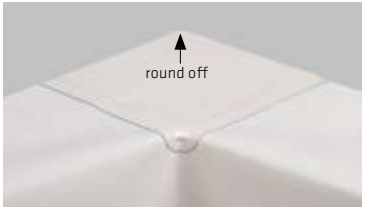
- Apply adhesive tape (3) over the metal sheet expansion joint of 3 mm.
- Cut a 80 mm wide Sarnafil® membrane strip (4).
- Weld only 20 mm on both sides along the edge of the membrane strip to the metal sheet (2).

- Adhere the Sarnafil® flashing strip (5) to the substrate using Sarnacol® adhesive. Make sure that the outermost 50 mm is free of adhesive to allow welding.
- The edge of the Sarnafil® flashing strip should stop 10 mm behind the folded down section of the metal sheet.
- Weld the Sarnafil® flashing strip (5) to the metal sheet (2).

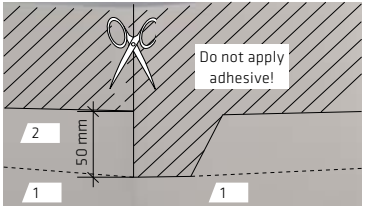
Inside corner
- Cut a Sarnafil® membrane corner patch to fit the inside corner.



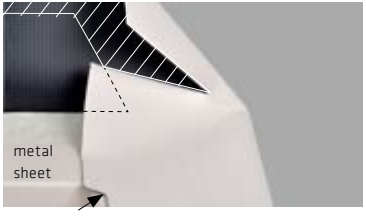
- Round the corner of the membrane patch.
- Heat and stretch the inside, rounded corner.



- Weld the Sarnafil® corner patch and round off the outer corner.

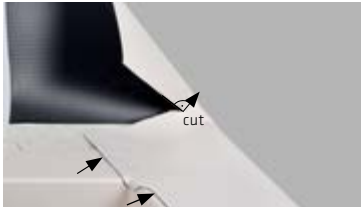


Outside corner
(Roof side view)
- Apply adhesive to substrate.
- Apply adhesive to the Sarnafil® flashing strip.
  Keep the area shown, free of adhesive to allow welding later on.
- Adhere the Sarnafil® flashing strip to the substrate (vertical roof trim area 1).



- Cut open the corner to a distance of 50 mm above the top of the parapet.
- Adhere the Sarnafil® flashing strip to the front edge area of the parapet (marked area with 2).

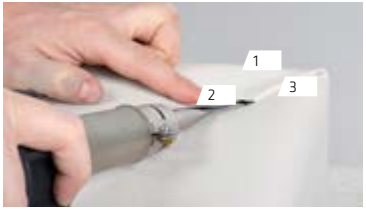
(View from outside / metal sheet side)
- Cut the flashing strip to size at the adhered parapet front edge.



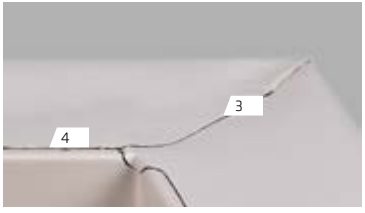
- Weld the flashing strip to the metal sheet.
- Cut the upstanding Sarnafil® flashing strip in a right angle as illustrated.

3 ROOF TRIM

- Form a crease.
- Weld the crease together (membrane pocket).

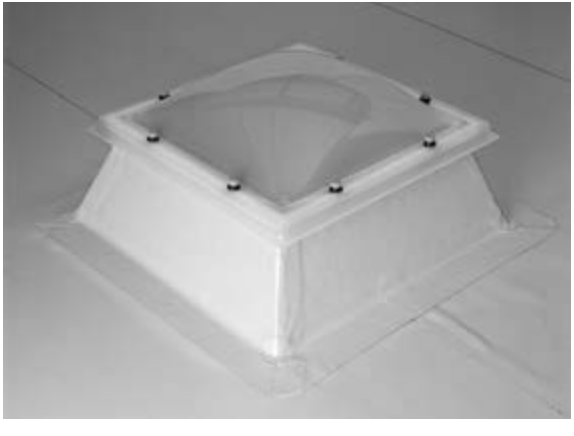


(View from roof side)
- Fold down the welded crease and adhere the Sarnafil® flashing strip to the substrate layer (1).
- Cut the flashing strip (2).
- Weld the crease to the flashing strip (3).



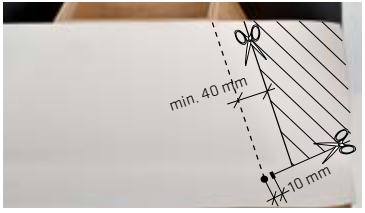
(View from outside / metal sheet side)
- Weld the Sarnafil® flashing strip to the metal sheet (4).

COMPLETED SKYLIGHT DETAIL



4 SKYLIGHT

- Apply Sarnacol® adhesive around the skylight.
- Apply Sarnacol® adhesive to two Sarnafil® membrane strips and adhere to the opposing sides of the skylight. Ensure installation without air pockets.

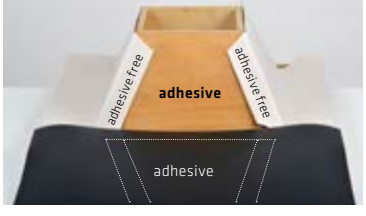


- Mark and cut the corners as illustrated.

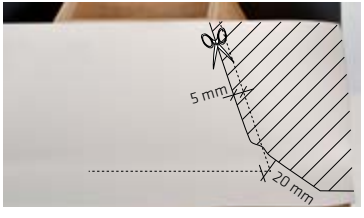
- Warm up the Sarnafil® membrane overlap.

4 SKYLIGHT

- Fold the membrane overlap around the skylight edges and adhere.



- Take the remaining two Sarnafil® membrane flashing strips and mark the adhesive areas.
- Adhere the two remaining Sarnafil® flashing strips without air pockets.



- Cut the Sarnafil® membrane strips along the line as illustrated.
- In the lower corner area – leave an additional membrane "thumb tab" of 20 mm for welding.

4 SKYLIGHT

- Pre-weld and final weld along the vertical seam starting from the “thumb tab”.

- Round off the corners of the horizontally projecting Sarnafil® membrane strips (1).
- Cut off excess material as illustrated.

- Pre-weld and final weld the horizontal seam.

- Weld the membrane “thumb tab”.
- Weld (gradually) from the inside towards the seam front edge.

- Press down the warmed up Sarnafil® membrane (thumb tab).

- Weld the membrane overlap shut at the bottom.

4 SKYLIGHT

Completed skylight

- Seal the upper open perimeter and the joint of the skylight frame using Sarnaplast®.
- For sealing instructions refer to the corresponding chapter in this application manual.

COMPLETED DRAIN DETAIL

5 DRAINS

Prefabricated drains should be used (Sarnafil® T Drains or S-Drains).

- Secure the drain to the substrate.
- Cut a hole into the Sarnafil® membrane, approx. 20 mm larger than the diameter of the drain.

- Handweld the Sarnafil® roofing membrane directly to the flange of the drain using a 20 mm wide nozzle.

COMPLETED SCUPPER DETAIL

6 SCUPPERS

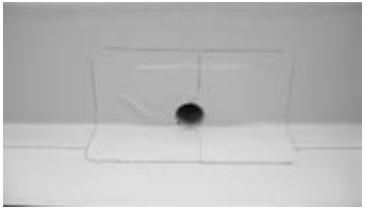
Prefabricated scuppers should be used (Sarnafil® T Scuppers or S-Scupper).

- Secure the scupper to the substrate. Make sure fasteners do not protrude.

- Cut two matching Sarnafil® membrane pieces as illustrated. Cut larger than Scupper size.
- Weld the first Sarnafil® membrane piece to the bent flange.

- Weld the second piece overlapping the first.

6 SCUPPERS



- Secure the prepared scupper to the roof and parapet by welding on the pre-attached Sarnafil® flashing strips.
- Weld the overlap to the Sarnafil® flashing strip and the roofing membrane (upstands and roof level).

COMPLETED OVERFLOW DETAIL

7 OVERFLOWS

- Prefabricated owerflows should be used (Sarnafil® T-Owerflow or S-Owerflow).

Application Variation 1
- Secure the overflow to the parapet.
- Make sure fasteners do not protrude.

- Adhere the Sarnafil® membrane flashing strip to the parapet with Sarnacol®.
- Cut a hole into the flashing strip with a diameter approx. 5 mm larger than the overflow.
- Weld the Sarnafil® flashing strip to the flange of the overflow using a 20 mm wide nozzle

Application Variation 2
Flashing strip pre-adhered

a. Preperation of overflow

- Cut a piece of membrane as illustrated – larger than the overflow flange.
- Cut a hole into the membrane piece. The diameter should be approx. 5 mm larger than the diameter of the overflow.
- Weld the membrane piece to the overflow flange using a 20 mm nozzle

b. Installation of overflow to parapet

- Secure the prepared overflow to the roof and parapet by welding on the pre-adhered flashing strip.
- Weld the membrane overlap of the overflow to the adhered flashing strip.

8 VENT PIPE FLASHING

COMPLETED VENT PIPE DETAIL WITH PLASTC CAP

8 VENT PIPE FLASHING

- Cut a flange from a piece of Sarnafil® membrane.
- Cut a hole into the flange approx. 10 mm smaller than the diameter of the vent pipe.

- Slide the flange, without heating, over the vent pipe to create an upstand of 10 mm.
- Cut a piece of Sarnafil® membrane as pipe flashing with an overlap of 30 mm.

- Spot weld the overlap of the pipe flashing.

8 VENT PIPE FLASHING

- Round the edges of the pipe flashing overlap.
- Pull the pipe flashing off the vent pipe.

- Evenly warm up the bottom edge of the Sarnafil® pipe flashing.

- Stretch by at least 15 mm.

8 VENT PIPE FLASHING

- Put the pipe flashing over the pipe and weld the rounded edges of the overlap area.

- Pre-weld the pipe flashing to the Sarnafil® membrane – while pressing down with a finger.

- Final-weld the pipe flashing to the Sarnafil® membrane using a pressure roller.

8 VENT PIPE FLASHING

- Weld the vertical seam.
- Cut the Sarnafil® pipe flashing level with the top of the vent pipe.
- Weld the flange to the Sarnafil® membrane (1).

Finishing with a plastic cap:

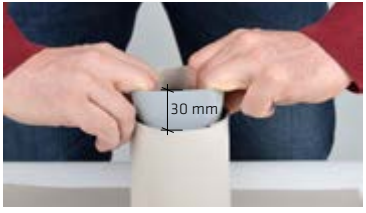
- It is recommended to cover the vent pipe with a plastic pipe cap.
- Stretch the membrane by at least 15 mm.

Finishing with handmade cap:

- If no plastic cap is available, form a handmade vent pipe cap:
- Insert a piece of Sarnafil® membrane into the vent pipe, light-side inwards minimum 50 mm length / overlapping approx. 20 mm.
- Spot weld the overlap.
- Cut the overlap edge as illustrated.

8 VENT PIPE FLASHING

- Pull the whole membrane piece out of the vent pipe.
- Weld the inside overlap.



- Insert the membrane piece into the vent pipe again.
- Make sure that approx. 30 mm protrudes.
- Bend the membrane piece over the vent pipes.

- Spot weld the membrane piece in several places to the pipe flashing membrane.

NOTES

FOR MORE ROOFING INFORMATION:

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