

SILCOR[®] 500 EM

Single component polyurethane, elastomeric liquid waterproofing membrane for roofs, inverted roofs, balconies, wet rooms etc.

Product Description

SILCOR[®] 500 EM is a single component, liquid waterproofing membrane based on hydrophobic polyurethane resins. The liquid cures to form a flexible, tough, elastomeric membrane with premium mechanical properties. An optional accelerator is available to reduce drying times and to increase viscosity.

Advantages

- **European Technical Approval** – Meets the requirements of ETAG 005
- **Seamless** – liquid applied to eliminate vulnerable joints with easy detailing.
- **Simple application** – one component, roller applied, no specialist equipment needed.
- **Cold applied** – no fire risk.
- **Flexible** – elastomeric membrane, able to bridge cracks and accommodate normal structural movement, elongation > 800%.
- **Fully bonded** – no risk of water tracking between membrane and substrate.
- **Weather resistant** – waterproofing properties maintained after exposure to UV, frost and water.

Principal Applications

New and remedial waterproofing of:

- Roofs
- Inverted roofs
- Balconies & terraces
- Wet rooms

System Components

- **SILCOR[®] 500 EM** – single component polyurethane resin.
- **SILCOR[®] 500 EM Accelerator** – optional component to reduce drying times and increase viscosity.
- **SILCOR[®] Non-Woven** – polyester fabric reinforcement.
- **SILCOR[®] Primer EP LT** – 3 component epoxy primer, fast curing at low temperature and for cementitious substrates.
- **SILCOR[®] Primer EPF** – 2 component epoxy primer for cementitious substrates.
- **SILCOR[®] Primer PU 30** – 1 component polyurethane primer for bitumen sheets (mineralised face).
- **SILCOR[®] Primer MT** – 2 component epoxy-phosphate primer for metal substrates.
- **SILCOR[®] Top Coat 50** – optional ultra-violet resistant top coat for colour stability, limited access roofs.

Refer to separate product data sheets for further details of individual system components.

Design

Flat roofs are defined as those having a minimum finished fall of 1:80. For design purposes, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls etc.

Roof decks must comply with the relevant sections of BS 6229: 2003 and, where appropriate, NHBC Standards 2016 Chapter 7.1 'Flat roofs and balconies'.

Compatibility/Adhesion

SILCOR® 500 EM can be used on the following substrates:

- Concrete¹
- metal²
- sprayed foam insulation
- mineral wool panels
- bitumen sheets (mineralised face)³

¹ Primed with SILCOR® Primer EPF or SILCOR® Primer EP LT

² Primed with SILCOR® Primer MT

³ Primed with SILCOR® Primer PU 30

Installation

1. Surface Preparation

Concrete

All surfaces should be dry, clean and free from loose particles, cement laitance, fungal growth, paint, grease and other contaminants that could affect adhesion. Where necessary, remove laitance mechanically by sand or grit blasting to provide an open pore substrate. Surfaces must be structurally sound and free of sharp protrusions, all defects in the substrate should be repaired with resin-based concrete repair mortars, used in accordance with the suppliers technical recommendations. Do not jet wash, as this will saturate the substrate and necessitate prolonged drying times. Max moisture content of concrete 5%. Concrete compressive strength should be minimum 15 MPa, 28 day cure. Minimum cohesive strength of concrete surface should be 0.8 MPa for limited access roofs and 1.5 MPa for public pedestrian access. All substrate cracks and joints should be raked to remove loose residues then primed with the appropriate SILCOR® primer. Fill all cracks with MS Fixer sealant.

Steel

Steel should be grit blasted to SA 2.5 specification or ground to remove the surface of the steel and any coatings. Solvent wipe the steel with acetone or a similar solvent prior to application of primer.

Bitumen Sheets

Only use SILCOR® Primer PU 30 on bitumen sheets (mineralised face). For concrete substrates, use SILCOR® Primer EPF.

All surfaces must be dry, clean, sound, free of dust, grease and any other contaminants that might affect adhesion.

Bitumen felts should be checked carefully. If the surface defects (cracks, blisters, poorly bonded laps, etc.) are less than 15% of the total surface area then it is feasible to apply SILCOR® Primer PU 30. All blisters in the bitumen sheets should be star cut and the substrate beneath dried fully with a vac and hot air gun. All cut edges and de-bonded laps should be re-bonded with ADCOR® Adhesive MS. Remove all un-bonded mineral stones.

Where bitumen sheet roofs have surface defects in excess of 15% of the total surface area, it is not feasible to apply SILCOR® Primer PU 30. Remove all bitumen sheets and residues from the substrate to expose the structural deck.

Use SILCOR® Primer EPF or SILCOR® Primer EP LT on all concrete substrates where bitumen sheets have been removed.

The substrate humidity before application of the primer must be less than 5%. The primer surface humidity before application of SILCOR® liquid membrane must be less than 5%.

2. Priming

Substrate temperature prior to application of both primer and membrane must be minimum 3 °C above dew point. All primers should be applied only between +5°C and +40°C ambient, except SILCOR® Primer EP LT which should be applied only between 0°C and +20°C.

SILCOR® Primer EPF – 2 component epoxy primer for cementitious and masonry substrates should be applied at a typical consumption rate of 0.35 kg/m² (see also separate product data sheet for SILCOR® Primer EPF). Coverage rates will vary depending on surface irregularity. The primer should be roller applied at a rate to give full substrate coverage but to prevent ponding. Leave the primer to dry and apply the first coat of SILCOR® 500 EM within 18 hours maximum. If application of SILCOR® 500 EM is delayed beyond this time, re-prime with a second coat of SILCOR® Primer EPF.

SILCOR® Primer EP LT – 3 component epoxy primer for cementitious and masonry substrates, fast curing at low temperatures (to be used between 0°C and +20°C). It should be applied at a typical consumption rate of 0.35 kg/m² (see also separate product datasheet for SILCOR® Primer EP LT). Immediately following the application of the primer and while still wet, scatter dry, washed quartz silica sand diameter 0.4 mm – 0.8 mm onto the primer and cover fully. Leave the primer to dry completely then remove all loose sand by thorough brushing/scrubbing.

SILCOR® Primer MT – 2 component phosphate/epoxy primer for metal substrates should be applied within 24 hours (at 60% RH) of completion of surface preparation to prevent 'flash rust'. Typical consumption rate is 0.15 kg/m². Apply SILCOR® 500 EM between 12 and 24 hours after application of SILCOR® Primer MT (20 °C). If application of SILCOR® 500 EM to SILCOR® Primer MT is delayed beyond this time, re-prime with a second coat of SILCOR® Primer MT.

SILCOR® Primer PU 30 – 1c PU primer for bitumen sheets (with mineralized face) should be applied by brush or roller, at a typical consumption rate of 0.20 – 0.30 kg/m². Coverage rates will vary depending on surface irregularity. The primer should be roller applied at a rate to give full substrate coverage but to prevent ponding. Leave the primer to dry and apply the first coat of SILCOR® 500 EM within 18 hours maximum. If application of SILCOR® 500 EM to primer is delayed beyond this time, re-prime with a second coat of SILCOR® Primer PU 30.

3. Application

Application ambient temperature range 5 °C – 40 °C. Maximum humidity 85%. Temperature during application should be stable or falling. During summer do not apply during the hottest part of the day. Stir the SILCOR® 500 EM thoroughly with a minimum 650W slow speed drill (max speed 300 RPM) fitted with a paddle mixer, avoiding air entrapment. For quicker drying times or to increase viscosity for vertical applications add SILCOR® 500 EM Accelerator and mix thoroughly.

SILCOR® 500 EM UNIT SIZE	SILCOR® 500 EM ACCELERATOR UNIT SIZE
25 kg	0.75 kg
6 kg	0.18 kg

Use the guidance table (Table 1) to determine whether SILCOR® 500 EM Accelerator should be used. Use the table below to plan the quantity of SILCOR® 500 EM necessary to cover the area to be waterproofed. Allow additional material for substrate roughness, detailing and waste.

Roof Waterproofing Applications

For all roof waterproofing applications use SILCOR® 500 EM, fully reinforced with SILCOR® Non Woven fabric.

Pour the SILCOR® 500 EM onto the primed substrate and spread with a roller, brush or saw tooth spatula at a minimum consumption of 1.2 kg/m² per layer. Lay SILCOR® Non Woven fabric reinforcement into the wet membrane, press in and roll flat with a roller to fully saturate the fabric. All lap joints in the fabric reinforcement should be minimum 50 mm.

All detail areas (roof/upstand joints, substrate cracks, penetrations, terminations, internal and external corners, etc) must be reinforced with fabric. Working within the recommended minimum and maximum times, apply a second layer of SILCOR® 500 EM at a minimum consumption of 1.2 kg/m².

SILCOR® 500 EM can also be sprayed through airless spray equipment. Contact GCP for further guidance.

Non Roof Applications

For non roof waterproofing applications, it is not usually necessary to fully reinforce with SILCOR® Non Woven fabric.

Pour the SILCOR® 500 EM onto the primed substrate and spread with a roller, brush or saw tooth spatula at a minimum consumption of 0.75 kg/m² per layer.

All detail areas (roof/upstand joints, substrate cracks, penetrations, terminations, internal and external corners, etc) must be reinforced with SILCOR® Non Woven fabric. All lap joints in the fabric reinforcement should be minimum 50 mm. Fully saturate the fabric by applying additional SILCOR® 500 EM at a total minimum consumption of 0.90 kg/m². Working within the recommended minimum and maximum times, apply a second layer of SILCOR® 500 EM at a minimum consumption of 0.75 kg/m².

4. Curing

SILCOR® 500 EM is rain stable after 4 hours and is typically fully cured after 7 days, irrespective of temperature. Use of the accelerator does not reduce full cure time but will reduce rain stable time by approx 50%.

5. UV Resistant Topcoats

SILCOR® 500 EM does not need additional protection from UV radiation to maintain long term waterproofing integrity. Over time SILCOR® 500 EM will show some 'yellowing' and chalking. Where colour stability or a non chalking finish is required use SILCOR® Top Coat 50 (limited access roofs) applied in one or two coats

6. Anti Slip Finishes

Where an anti-slip finish is required apply a third coat of SILCOR® 500 EM at a minimum rate of 0.9 kg/m², and broadcast at a 50% coverage rate with silica quartz aggregate, 0.8 – 1.2 mm dia, applied whilst the membrane is still wet. Remove all unbonded quartz aggregate and, if required for colour stability, apply SILCOR® Top Coat 50 in one or two coats.

7. Protection

Where SILCOR® 500 EM is exposed to damage from construction activities or installation of finishes (e.g. paving), protect with GCP Protection Boards or a minimum 5 cm thick protective screed.

8. Tool Cleaning

Tools and equipment should be cleaned with xylene or MEK solvent

SILCOR® 500 EM – Recommended Application Consumptions (kg/m²)

Roof Waterproofing System (CE marked)

FIRST COAT	SECOND COAT	TOTAL
1.2	1.2	2.4

Other Applications

FIRST COAT	SECOND COAT	TOTAL
0.75 - 0.90	0.75 - 0.90	1.5 - 1.8

Check the primer is dry and that all unbonded sand has been removed, if necessary repeat the brushing and vacuum cleaning process.

NBS Specification Clause

Refer to Clause J31/130

Chemical Resistance

SILCOR® 500 EM is resistant to a wide range of chemicals. Contact GCP for specific details and recommendations

Warranties

GCP and trained contractors will provide warranties for individual projects. Contact GCP for further details.

Storage

All products should be stored in original packaging at temperatures between 5 °C and 25 °C. Protect products from all sources of heat, moisture, frost and direct sunlight. Shelf life for all products is 9 months maximum.

Health and Safety

SILCOR® 500 EM is slippery when wet, please take appropriate precautions. An anti-slip finish can be achieved if required, please follow the recommendations in this data sheet.

For all SILCOR® products read the product label and Safety Data Sheet (SDS) before use. Users must comply with all risk and safety phrases. SDS's can be obtained from gcpat.com.

Table 1

AMBIENT TEMP °C, AT 50% RH	POT LIFE (MINS)		TIME TO ACCEPT LIGHT FOOT TRAFFIC/MINIMUM TIME BEFORE SECOND COAT APPLIED (HOURS)		MAXIMUM TIME BEFORE SECOND COAT APPLIED (HOURS)	
	no acc	acc	no acc	acc	no acc	acc
30	30	15	8	6	36	24
20	45	25	12	8	48	36
10	60	35	24	12	60	48
5	60	55	36	24	72	60

Supply

UNIT OF SALE	
SILCOR® 500 EM	25 kg drum, 6 kg drum
SILCOR® 500 EM Accelerator	0.75 kg bottle, 0.18 kg bottle,
SILCOR® Non Woven	1.05 m x 50 m roll 0.20 m x 50 m roll
SILCOR® Primer EP LT Part A	3.16 kg
SILCOR® Primer EP LT Part B	0.72 kg
SILCOR® Primer EP LT Part C	1.12 kg
SILCOR® Primer EPF Part A	3.2 kg metal can
SILCOR® Primer EPF Part B	1.8 kg metal can
SILCOR® Primer MT Part A	6.2 kg metal can
SILCOR® Primer MT Part B	0.9 kg metal can
SILCOR® Primer PU 30	10 kg or 20 kg metal can
ADCOR® Adhesive	310 ml cartridge
SILCOR® Top Coat 50	5 kg & 10 kg
Light grey	5 kg & 10 kg
Silver grey	
White	
Red-brown	

All declared values shown in this data sheet are based on test results determined under laboratory conditions and with the product sample taken directly from stock in its original packing without any alteration or modification of its component parts.

Physical properties

PROPERTY	TYPICAL VALUE	TEST METHOD
Liquid Membrane		
Solids content	80%	Internal
Density	1.4 Kg/dm ³	DIN 53217
Viscosity	90 s	ISO 2431:1993 (6 mm nozzle)
Flashpoint	25 °C	
Fully Cured Membrane		
Tensile Strength	4.0 N/mm ²	ASTM D412
Elongation	800%	ASTM D412
Shore A Hardness	65	ASTM D2240
Adhesion to dry concrete	> 2 N/mm ² (concrete failure)	ASTM D903
Adhesion to bitumen sheet (with mineralised face using SILCOR® PU 30 primer)	> 1.0 N/mm ²	ASTM D1876
Water vapour permeability	25 g/m ² /day	ISO 9932
Hydrostatic head resistance	No leak 1mWc/24 hr	DIN EN 1928
Fire class	B2	DIN 4102-1

European Technical Approval

Classes according to ETAG005-6 liquid applied roof waterproofing kits based on polyurethane.

	PROPERTY	VALUE
	Minimum layer thickness	1.6 mm
	Water vapour diffusion resistance factor (μ)	~ 1830
CE	Resistance to wind loads	≥ 50kPa
	Reaction to fire	Class E

CE	External fire performance class	Class F _{roof}
ETA	Dangerous substances	Does not contain any
12/0103	Working life	W2
Dibt	Climate zones	M and S
	Imposed loads	P1 to P3
	Roof slope	S1 to S4
	Lowest surface temperature	TL3
	Highest surface temperature	TH4

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