

Substructure Waterproofing - Membranes

Preprufe®

Pre-applied waterproof membranes that develop an adhesive bond to poured concrete to prevent water migration. For use below slabs and on basement walls.

Description

Preprufe® waterproof membranes are composite sheets comprising a robust HPDE backing, a pressure sensitive adhesive and a trafficable weather resistant coating. Uniquely, the membrane develops a continuous adhesive bond to concrete poured against it. This prevents water migration between the structure and the membrane, substantially reducing the risk of leaks.

Applications

- Water and vapour proofing all basement grades to BS 8102:2009.
- Waterproofing civil engineering sub - structures.
- Methane, carbon dioxide and radon gas protection in excess of the standard membrane requirements in BRE Reports 211 (Radon) and 212 (Methane and Carbon Dioxide).

Independent Assessments

- BBA Certificate No. 97/3325.
- Mott MacDonald Special Services Report May 2001.
- International Certifications.

Advantages

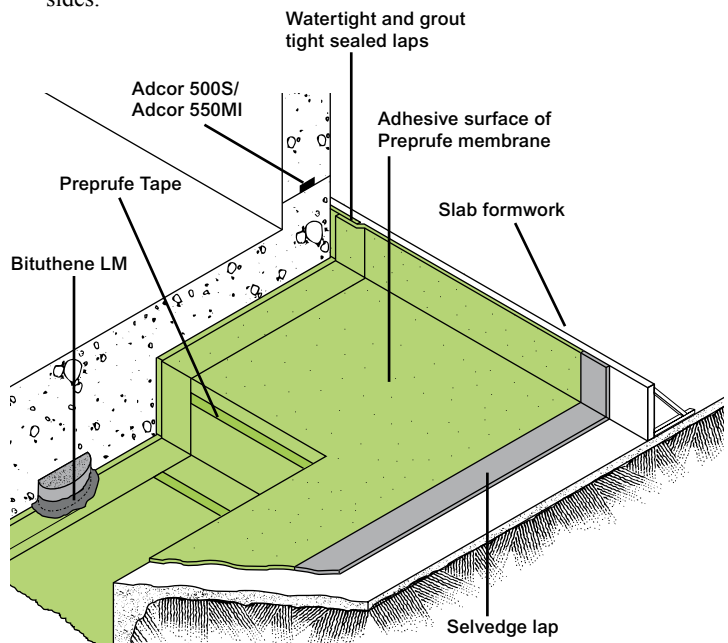
- **Versatile** - can be used beneath foundation slabs and with single or double-sided formwork systems.
- **Seals adhesively to concrete** - the only technology proven to resist water migration.
- **Lightweight, flexible** - easy to handle and install without special corner pieces.
- **No butt joints** - all joints have bonded 'selvedge' or Preprufe Tape overlaps for increased leak protection.
- **Inert** - unaffected by groundwater contaminants, ponded water or wet/dry cycling.
- **Remains sealed to structure** - even if ground settles.
- **Smooth surface membrane** - site contamination easily removed.
- **Excellent chemical resistance** - protects structure from salts and sulphate attack.
- **Total system** - Full range of Grace hydrophilic and PVC waterstops available for concrete joint protection.

System Components

- Preprufe® 160R - used typically with concrete slab sections up to 350 mm thickness and vertically with single and double sided formwork systems.
- Preprufe® 300R - used typically with concrete slab sections greater than 350 mm thickness. Superior damage resistance.
- Preprufe® Tape - incorporating Preprufe coating for continuous concrete adhesion at taped edges and details.
- Bituthene® LM - high performance liquid membrane for detailing terminations at pile caps and pipe penetrations.
- Adcor® 500S - hydro-expansive waterstop for concrete construction joints.
- Adcor® 550MI - hydro-expansive injectable waterstop for added security of concrete construction joints.

Application Material Storage

Sequence deliveries to avoid delays, but minimise on-site storage. Select a safe, covered secure location for material storage. Store materials for each day's use in a location that won't require movement a second time. Do not double-stack pallets of waterproofing on the job site. Store protection boards flat and off the ground. Provide cover on top and all sides.



Details shown are typical illustrations only and not working drawings. For assistance with working drawings and additional technical advice please contact Grace Technical Services

Substrate Preparation

Suitable substrates include:

- concrete blinding
- well compacted sand on rolled crushed stone
- rigid insulation
- clay heave boards
- permanent formwork
- removable formwork
- 19 mm plywood
- Hydroduct drainage sheets
- Adjacent sub-structures

Substrates should be uniform with no gaps or voids greater than 12mm. Where these exist fill with a material of sufficient strength to support the membrane. All substrates must be free of loose aggregate and sharp protrusions. Where possible, avoid sloping or rounded concrete blinding.

In crushed stone applications, it is important to create a sound and solid substrate around “through slab” penetrations to eliminate movement during the concrete pour. Excessive movement may jeopardise the waterproofing integrity around the penetration. Grout around the penetration prior to installing the membrane for stabilisation.

The surface does not need to be dry, but standing water must be removed. Substrates must have sufficient rigidity not to move during the concrete pour. Boarded substrates must be close butted to provide support and not more than 12 mm out of alignment.

Installation - General

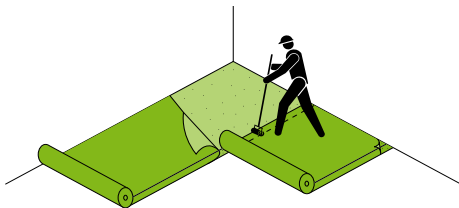
Tools /materials required:

- Heavy duty lap roller
- Stanley /Utility knives
- Tape measure
- Cotton cleaning cloths
- Plywood or similar cutting board
- Thin metal straight edge
- Chalk line
- Broom
- 2 metre long pipe or heavy broom handle
- Spiral mixing paddle for Bituthene LM
- Round nose trowel or spatula
- Required protection and/or drainage boards and other ancillary products

Preprufe membranes are supplied in rolls 1.2m wide with a self adhesive selvedge on one edge to enable fully bonded laps between adjacent rolls. All other laps must be taped with Preprufe Tape. Minimum application temperature +5°C.

When installing Preprufe in cold or marginal weather conditions (<13°C) the use of Preprufe Tape LT is recommended at all laps and detailing. Preprufe Tape LT should be applied to clean dry surfaces and the release liner must be removed immediately after application

Installation - Horizontal

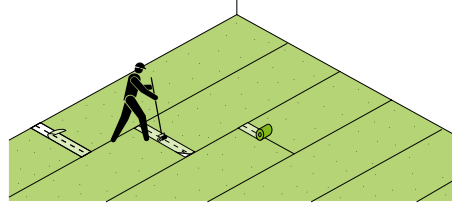


Place the membrane with the removeable plastic release liner uppermost. End laps should be staggered to avoid a build up of layers. Leave plastic release liner in position until overlap procedure is completed. Accurately position subsequent sheets to overlap the previous sheet 75mm along the selvedge. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Peel back the plastic release liner from between the overlaps as the two layers

are bonded together. Ensure a continuous bond is achieved without creases and roll firmly. On completion of the installation, **ensure complete removal of the plastic release liner from all membrane and tape.**

End Laps and Cut Edges

Overlap all roll ends and cut edges by a minimum 75mm and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary. Allow to dry and apply Preprufe Tape centred over the lap and roll firmly. Refer also to Preprufe Standard Details.



Internal & External Corners

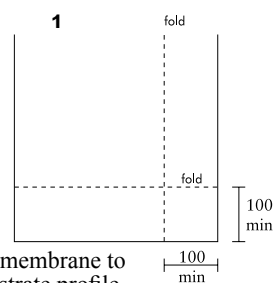
Internal & external corners should be formed as shown in the diagrams below. Ensure that all laps are 100 mm minimum, taped with Preprufe Tape and well rolled. Crease and fold the membrane to ensure a close fit to the substrate profile.

Penetrations

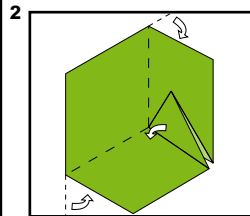
To seal around penetrations such as service pipes, pile heads, lightning conductors, etc. mark and cut membrane tight to the penetration. If the membrane is not aligned within 12mm of the penetration, apply Preprufe Tape lapped onto the membrane and butted tight to the penetration. For pipe penetrations, wrap the pipe with Preprufe Tape. Mix and apply Bituthene LM around the penetrations using a fillet to provide a watertight seal between the Preprufe membrane and Tape. Refer also to Preprufe Standard Details.

Corners

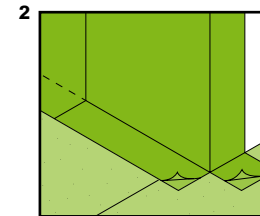
Internal and external corners should be formed as shown in the diagrams returning the membrane a minimum of 100mm and sealing with Preprufe Tape. Ensure that the apex of the corner is covered and sealed with Tape and roll firmly. Crease and fold the membrane to ensure a close fit to the substrate profile and avoid hollows.



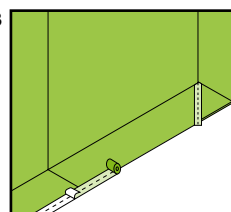
Internal



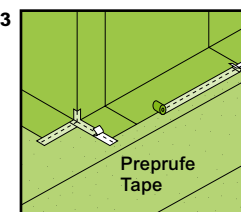
External



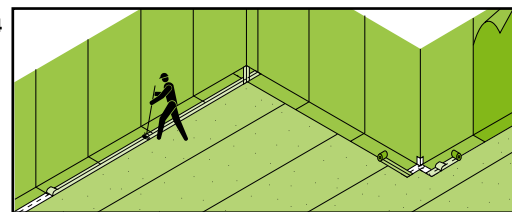
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Penetrations

To seal around penetrations such as service pipes, pile heads, lightning conductors, etc. mark and cut membrane tight to the penetration. If the membrane is not aligned within 12mm of the penetration, apply Preprufe Tape lapped onto the membrane and butted tight to the penetration. For pipe penetrations, wrap the pipe with Preprufe Tape. Mix and apply Bituthene LM around the penetrations using a fillet to provide a watertight seal between the Preprufe membrane and Tape. Refer also to Preprufe Standard Details.

Membrane Repair

Inspect the membrane for damage before installation of reinforcement steel, shuttering and final placement of concrete. Clean by jet washing if required.

Wipe the area with a damp cloth to ensure the area is clean and free from dust, and allow to dry. For minor repairs, apply Preprufe Tape centrally over the damaged area and roll firmly. For larger repairs use a patch of Preprufe and tape all edges with Preprufe Tape. Remove plastic release liner from Tape.

Where exposed selvedge has lost adhesion or laps have not been sealed, ensure the area is clean and dry and overband with Preprufe Tape and roll firmly.

Installation - Vertical

Apply the membrane with the thick white plastic face against the substrate. Mechanically fasten the membrane vertically using flat headed fixings appropriate to the substrate. The membrane may be installed in any convenient length. Secure the top of the membrane using a batten or fixing 50 mm below the top edge. Use fixings at typically 600 mm centres to secure the membrane flat against the substrate. Fixings can be made through the selvedge, this allows firmly rolled overlaps, which are covered by the subsequent strip of Preprufe. Any exposed fixings should be patched with Preprufe Tape.

Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Peel back the plastic release liner from between the overlaps as the two layers are bonded together. Ensure a continuous bond is achieved without creases and roll firmly. On completion of the installation, **completely remove the plastic release liner from all membrane and tape.**

Formwork Lining

Preprufe can be pre-applied to vertical formwork. Contact Grace for further guidance.

Removal of Formwork

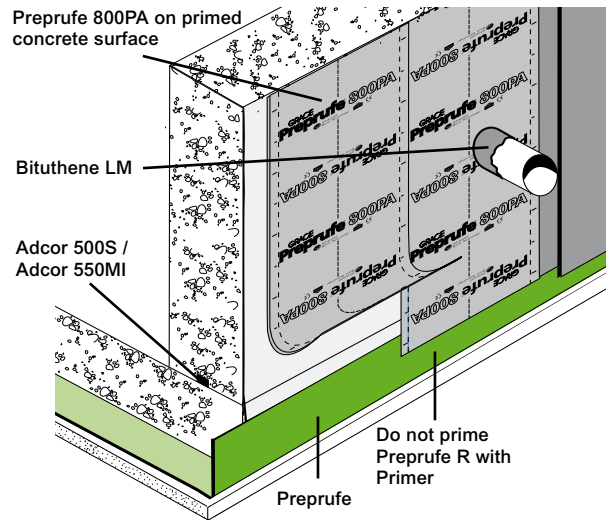
Preprufe membranes can be applied to removable single and double sided formwork, slab perimeter formwork, pile caps, etc. Once concrete is poured the formwork must remain in place until the concrete has gained sufficient compressive strength to develop the surface bond with Preprufe.

A minimum concrete compressive strength of 10 N/mm² is recommended prior to stripping formwork supporting Preprufe membranes. Premature stripping may result in loss of adhesion between the membrane and concrete.

Wall Waterproofing Options

Grace also offers alternatives to pre-applying Preprufe to vertical formwork.

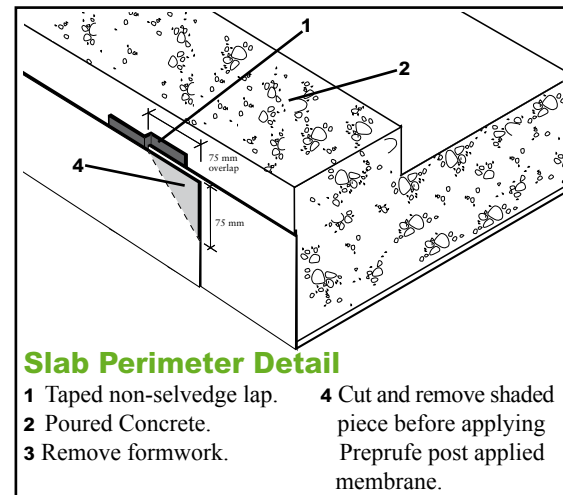
For conventional application to walls after formwork removal use Preprufe® 800PA - self adhesive sheet waterproofing membrane. See separate data sheet for further information.



Preprufe 800PA post-applied to walls in conjunction with Preprufe below slabs

Preprufe Preparation When Preprufe 800PA Is Used on Walls

Inspect the Preprufe around the perimeter edge of the concrete slab. Identify any exposed non-selvedge overlaps in Preprufe. To ensure continuity of the fully bonded system, carefully cut and remove a 75 mm triangular piece of the top flap of Preprufe only, as shown shaded in the standard detail, Slab Perimeter Detail - non selvedge lap.



Slab Perimeter Detail

- 1 Taped non-selvedge lap.
- 2 Poured Concrete.
- 3 Remove formwork.
- 4 Cut and remove shaded piece before applying Preprufe post applied membrane.

Ancillary Products

Adcor® 500S – Hydrophilic waterstop for construction joints and pipe entries.

AT System – Co-extruded PVC waterstops for movement joints.

Bituthene Protection Board – protection against damage from backfill.

Limitations of Use

- Do not use Preprufe between concrete infilled hollow block walls.
- It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the membrane.

NBS Specification Clause

Refer to clause J40 297

Health and Safety

There is no requirement for a Material Safety Data Sheet for Preprufe. For health and safety questions on this product please contact Grace. For Bituthene LM, read the product label and Material Safety Data Sheet (MSDS) before use. Users must comply with all risk and safety phrases. MSDS's can be obtained from Grace Construction Products.

Supply

Preprufe	300R	160R	Tape LT* or HC*
Thickness (nominal) (mm)	1.2	0.8	0.7
Roll size (m)	1.2 x 30	1.2 x 35	100 x 15
Roll area (m ²)	36	42	
Roll weight (kg)	50	42	2
Minimum edge/end laps (mm)	75	75	75
*LT denotes for temperature between -4°C and +30°C *HC denotes for temperature between +10°C and +40°C			
Ancillary Products			
Adcor® 500S	6 x 5m rolls		
Adcor® 550MI	8 x 5m rolls		
Bituthene® LM	5.7 litre pack		

Typical Properties

	300R	160R
Adhesion to concrete (N/mm)	2.88	2.88
Shear strength of joints (N/mm)	9.52	9.52
Hydrostatic head resistance (m) ASTM D 5385 mod.	> 70	> 70
Puncture resistance (N)	990	445
Water vapour transmission rate (g/m ² /24 hrs)	0	0
Methane permeability (mls/m ² .day.atm) Note 1	44.31	60.81
Radon Diffusion Coefficient (m ² /s)	7.7 x 10 ⁻¹²	5.7 x 10 ⁻¹²

Note 1: Typical value for BRE recommended minimum standard (BRE Report 212) is 360 ml/m²/day.

Declared values according to EN 13967

Property	Declared Value		Test Method	Property	Declared Value		Test Method
	160R	300R			Preprufe	160R	
Visible defects - MDV	No	No	EN 1850-2	Straightness - MDV	Pass	Pass	EN 1848-2
Length (m) - MDV	35 ± 0.15	30 ± 0.15	EN 1848-2	Thickness (mm) - MDV	0.9 ± 0.05	1.2 ± 0.05	EN 1848-2
Width Carrier Sheet (m) - MDV	1.203 ± 0.005	1.203 ± 0.005	EN 1848-2	Mass per unit area (g/m ²) - MDV	810 ± 50	1150 ± 70	EN 1848-2
Width Overall (roll) (m) - MDV	1.203 ± 0.005	1.203 ± 0.005	EN 1848-2	Durability of water tightness against ageing/degradation (at 60 kPa)	Pass	Pass	EN 12691 EN 1928
Water tightness to liquid water (at 60 kPa)	Pass	Pass	EN 1928	Durability of water tightness against chemicals (at 60 kPa)	Pass	Pass	EN 12691 EN 1928
Resistance to impact (Al-board) (mm) - MLV	250 - Pass	400 - Pass	EN 12691	Compatibility with bitumen	Pass	Pass	EN 1548
Resistance to impact (base EPS) (mm) - MLV	1800 - Pass	2000 - Pass	EN 12691	Resistance to static loading	Pass	Pass	EN 12730
Resistance to tearing (Nail Shank) - unreinforced sheets (N) - MLV	Long ¹ 300 Trans ² 450	Long ¹ 450 Trans ² 600	EN 12310-1	Tensile properties - unreinforced sheets (N/6mm) - MLV	Long ¹ 60 Trans ² 60	Long ¹ 110 Trans ² 120	EN 12311-2 Method B
Joint strength (N/50mm) - MLV	480	850	EN 12317-1	Tensile properties - unreinforced sheets (Elongation %) - MLV	Long ¹ 4.5 Trans ² 4	Long ¹ 4.5 Trans ² 4	EN 12311-2 Method B
Water vapour transmission (μ = sD/d) - MDV	950.000 - 970.000	835.000 - 855.000	EN 1931 Method B	Reaction to fire (Class; test conditions)	E	E	EN 13501-1
Resistance to deformation under load	NPD ⁵	NPD ⁵	EN 13967 Annex B				

Footnotes: 1. Longitudinal - related to the roll direction 2. Transversal - related to the roll direction
3. MDV: Manufacturer Declared Value 4. MLV: Manufactured Limiting Value 5. NPD: No Performance Declared

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.

	Grace Construction Products Ltd Ipswich Road, Slough, Berkshire SL1 4EQ United Kingdom 06 06/F017
	EN 13967 Preprufe® 160R and 300R Flexible Sheets for Waterproofing, Type T Reaction to fire: E Watertightness: Pass at 60 kPa

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