

# PREPRUFE<sup>®</sup> Plus

New generation Preprufe membranes with unique PREPRUFE<sup>®</sup> ZIPLAP<sup>™</sup> for fast, simple and secure applications in all seasons and climates.

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## Product Description

PREPRUFE<sup>®</sup> Plus waterproof membranes are composite sheets comprising a robust virgin HDPE backing, a pressure sensitive adhesive and a trafficable weather resistant coating with dual adhesive Preprufe ZIPLAP<sup>™</sup> for increased security and practicability at overlap. For waterproofing and protection of slabs and confined walls below ground, PREPRUFE<sup>®</sup> Plus membranes develop an integral watertight adhesive bond to poured concrete to prevent water migration.

GCP has combined its proven ADVANCED BOND TECHNOLOGY<sup>™</sup> - together with more than 25 years of major project experience to produce its highest performing waterproofing membrane with even more practical and economic benefits.

**ADVANCED BOND TECHNOLOGY<sup>™</sup>** - The membranes develop a continuous adhesive bond to concrete poured on or against it, preventing water migration between the structure and the membrane, significantly improving protection against leaks.

**Installation benefits** - Preprufe Plus is simple, fast and secure. Ancillary products are limited to a single tape and Bituthene Liquid Membrane for detailing. The full application can be executed by only two operators, saving labour cost and time. Unique Preprufe ZipLap allow instant lap forming even in adverse conditions.

## Applications

- Water and vapour proofing for 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 in BS 8485:2015 (see point 7.2.4).
- Protection of reinforced concrete structures in aggressive ground including the harshest conditions of the Arabian Peninsula

## Advantages

- **Fast, Simple and Secure** – engineered for efficient jobsite application and long term waterproofing performance
- **ADVANCED BOND TECHNOLOGY<sup>™</sup>** reduces risk - develops an intimate and continuous adhesive bond to concrete proven to resist water migration at the highest pressures
- **PREPRUFE<sup>®</sup> ZipLap<sup>™</sup> dual adhesive watertight laps** - easy to execute year round even in harsh conditions; laps stay clean and dry until the seal is made
- **Reduces cost and saves time** – fast installation, only 2 operator crew
- **No hidden extras** - no primers, sealants, fillets or specialist equipment

- **Extended exposure time** - unique UV barrier coating allows exposure up to 56 days prior to concreting, for programme flexibility or delays
- **Lightweight, easier handling** - reduced storage area and better safety vs thicker, heavier, bulky technologies
- **Simple system** - membrane and only single tape to install the waterproofing system
- **Easy detailing** - flexible membrane in use but keeps its shape and conforms to corners and other construction details
- **Smooth, non-absorbent surface** - unlike geotextile faced membranes, resists site contamination and easily cleaned before concreting to ensure intimate bonding
- **No compartments** - integral adhesive bond eliminates the need for complex welded compartments used with unbonded membranes
- **Cold applied, single layer** - no hot works, double layers or protection screed
- **Tough HDPE waterproof geomembrane** - durable, tough, chemical and gas resistant. Also isolates structure from salts and sulfate attack
- **25 Year Track Record** - PREPRUFE<sup>®</sup> membranes have been used on major projects around the world for more than 25 years
- **Passive waterproofing** - unlike bentonite based systems, does not rely on activation, is unaffected by groundwater contaminants, rain or wet/dry cycling during site and building life
- **Total GCP system** - full range of GCP hydrophilic and PVC waterstops available for concrete joint protection including wide movement joints (seismic area). Can be used in combination with GCP post-applied self-adhesive membrane range



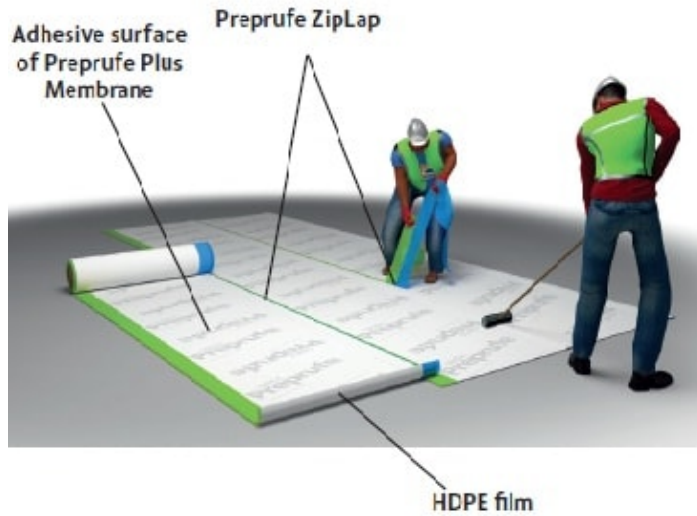
## System Components

- **Preprufe<sup>®</sup> 300R Plus and Preprufe<sup>®</sup> 300R LT Plus** - for use on all horizontal applications. Superior damage resistance
- **Preprufe<sup>®</sup> 160R Plus and Preprufe<sup>®</sup> 160R LT Plus** - for use with concrete slab sections up to 500 mm thickness, or vertically with single sided formwork systems
- **Preprufe<sup>®</sup> Tape** - incorporating Preprufe coating for continuous concrete adhesion at taped edges and details
- **Bituthene<sup>®</sup> LM** - high performance liquid membrane for detailing terminations at pile caps and pipe penetrations
- **Adcor<sup>®</sup> SAS 500S** - the ultimate self adhesive hydro expansive waterstop system for construction joints & penetrations
- **Adcor<sup>®</sup> 500T** - hydro-expansive waterstop for preventing saline and brackish water entry through concrete construction joints.
- **Adcor<sup>®</sup> 550MI/ 550 T-MI** - hydro-expansive injectable waterstop for added security of concrete construction joints.
- **AT System** - co-extruded PVC waterstops for movement joints.

## Application

### Material Storage

Sequence deliveries to avoid delays, but minimize 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.



**SUPPLY**

| Preprufe                    | 300R Plus                             | 160R Plus   | Tape LT*or HC* |
|-----------------------------|---------------------------------------|-------------|----------------|
| Thickness (nominal mm)      | 1.2                                   | 0.8         | 0.7            |
| Roll size (m)               | 1.17 x 31.0                           | 1.17 x 36.5 | 100 mm x 15    |
| Roll area (m <sup>2</sup> ) | 36                                    | 42          |                |
| Roll weight (kg)            | 50                                    | 42          | 2              |
| Minimum edge/end laps (mm)  | 75                                    | 75          | 75             |
| <b>Ancillary Products</b>   |                                       |             |                |
| Adcor SAS 500S              | 6 x 5m rolls                          |             |                |
| Adcor 550MI                 | 8 x 5m rolls                          |             |                |
| Bituthene LM                | 5.7 litre pack                        |             |                |
| AT System                   | Factory made junctions & fabrications |             |                |

**TYPICAL PROPERTIES**

|   | 300R Plus | 160R Plus |
|---|-----------|-----------|
| Adhesion to concrete (N/mm <sup>2</sup> ) | 2.88      | 2.88      |
| EN 1372                                   |           |           |

|  |                         |                         |
|--|-------------------------|-------------------------|
| Shear strength of joints (N/mm) EN 12317-2                                 | 14.5                    | 14.5                    |
| Methane permeability<br>(ml/m <sup>2</sup> .day.atm)<br>ISO 15105-1 Note 1 | 5.83                    | 5.37                    |
| Radon Diffusion Coefficient (m <sup>2</sup> /s)                            | 2.6 x 10 <sup>-12</sup> | 5.6 x 10 <sup>-12</sup> |

*Note 1: Typical value for BS 8485:2015 recommended minimum standard is 40 ml/m<sup>2</sup>/day according to ISO 15105-1*

#### PHYSICAL PROPERTIES

| Property                              | Typical Value<br>300R Plus                | Typical Value<br>160R Plus                | Test Method                       |
|---------------------------------------|---|---|-----------------------------------|
| Colour                                | white                                     | white                                     |                                   |
| Thickness                             | 1.2 mm                                    | 0.8 mm                                    | 0.8 mm                            |
| Lateral Water Migration Resistance    | Pass at 71 m of hydrostatic head pressure | Pass at 71 m of hydrostatic head pressure | ASTM D5385, modified <sup>1</sup> |
| Low temperature flexibility           | Unaffected at -29 °C                      | Unaffected at -29 °C                      | ASTM D1970                        |
| Resistance to hydrostatic head        | 71 m                                      | 71 m                                      | ASTM D5385, modified <sup>2</sup> |
| Elongation                            | 500%                                      | 500%                                      | ASTM D412, modified <sup>3</sup>  |
| Tensile strength, film                | 27.6 MPa                                  | 27.6 MPa                                  | ASTM D412                         |
| Crack cycling at -23 °C, 100 cycles   | Unaffected, Pass                          | Unaffected, Pass                          | ASTM C836 <sup>4</sup>            |
| Puncture resistance                   | 990 N                                     | 445 N                                     | ASTM E154                         |
| Peel adhesion to concrete             | 880 N/m                                   | 880 N/m                                   | ASTM D903, modified <sup>5</sup>  |
| Lap peel adhesion at 22 °C            | 1408 N/m                                  | 1408 N/m                                  | ASTM D1876, modified <sup>6</sup> |
| Lap peel adhesion at 4 °C             | 1408 N/m                                  | 1408 N/m                                  | ASTM D1876, modified <sup>6</sup> |
| Permeance to water vapor transmission | 0.6 ng/(Pa x s x m <sup>2</sup> )         | 0.6 ng/(Pa x s x m <sup>2</sup> )         | ASTM E96, method B                |

#### Footnotes:

1. Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the membrane.
2. Hydrostatic head tests of Preprufe Membranes are performed by casting concrete against the membrane with a lap. Before the concrete cures, a 3 mm spacer is inserted perpendicular to the membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to the head indicated.
3. Elongation of membrane is run at a rate of 50 mm per minute.
4. Concrete is cast against the Preprufe membrane and allowed to cure (7 days minimum)
5. Concrete is cast against the protective coating surface of the membrane and allowed to properly dry (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 50 mm per minute at room temperature.
6. The test is conducted 15 minutes after the lap is formed (per GCP published recommendations) and run at a rate of 50 mm per minute at 22 °C.

## Limitations of Use

It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the membrane.

## NBS Specification

Refer to clause J40 297.

## 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 12 mm. 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 rounded concrete blinding. 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

Please refer to Preprufe Plus Application Manual for detailed instructions.

Preprufe Plus is available in two versions, Preprufe 300R Plus and 160R Plus for application above +5 °C and Preprufe 300R LT Plus and 160R LT Plus for application between -5 °C and +30 °C. Preprufe Tape is also available in two versions, Preprufe Tape HC for application above +10 °C and Preprufe Tape LT for application between -5 °C and +30 °C.

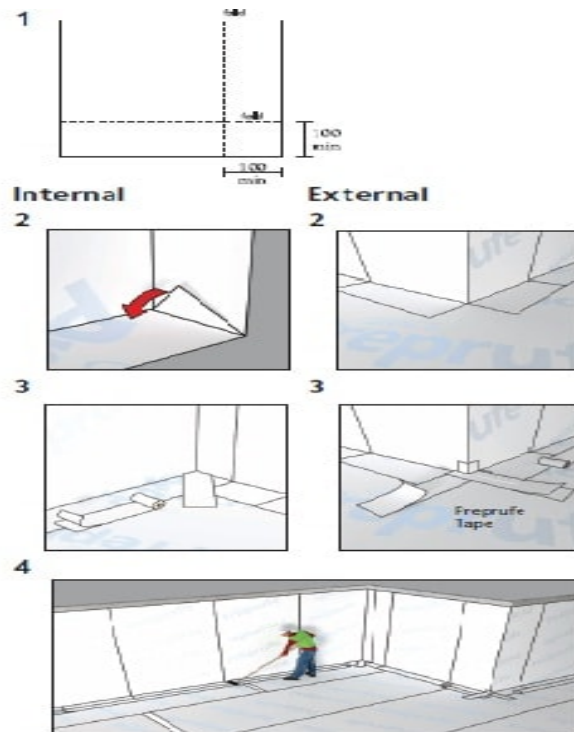
**Preprufe ZipLap** – Preprufe Plus membranes are supplied in rolls 1.17 m wide including the Preprufe ZipLap incorporating dual adhesive layers with coloured zip strips at the top and bottom of the seam area on the edge of the roll. The zip strips keep the lap area clean and dry until the moment the ZipLap is made and enables even stronger bonded laps between adjacent rolls. Both zip strips cover an aggressive adhesive. Once the green zip strip on the top of the membrane and the blue zip strip on the bottom of the membrane are removed, a strong adhesive to adhesive bond is achieved in the overlap area. Minimum application temperature for Ziplap is 0 °C (Preprufe LT Plus). Preprufe can continue to be installed to a minimum of -5 °C using instead Preprufe Tape LT to overband all laps. Preprufe Tape should be applied to clean dry surfaces and the release liner must be removed immediately after application.

## Installation – Horizontal

Place the membrane with the green zip strip facing towards the concrete pour. Kick out or roll out the membrane with HDPE film side to the substrate. End laps should be staggered to avoid a build up of layers. Leave green and blue zip strips on the membrane until overlap procedure is completed. Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvedge. Peel back and remove both the green and blue zip strips in the overlap area to achieve an adhesive to adhesive bond at the overlap. Ensure a continuous bond is achieved without creases and **roll firmly with a heavy roller**. On completion of the installation, **ensure complete removal of the plastic zip strips from all overlaps and Tape**.

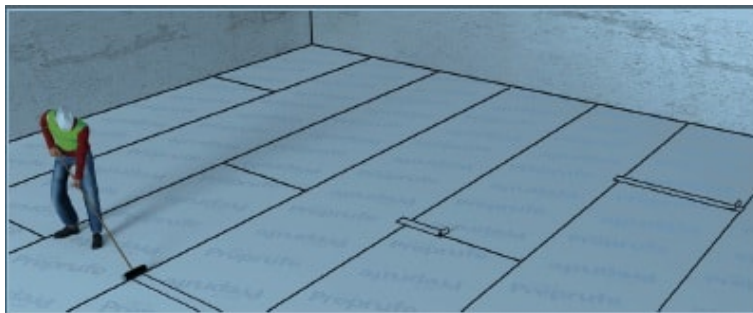
## Internal & External Corners

Internal & external corners are easily formed as shown in the diagrams below (refer to Preprufe Plus Application Manual for more details). 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.



## End Laps and Cut Edges

Overlap all roll ends and cut edges by a minimum 75 mm 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 Plus Standard Details.



## 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 12 mm 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 Plus membrane and Tape. Refer also to Preprufe Plus Standard Details.

## Membrane Repair

Inspect the membrane for damage before installation of reinforcement steel, shuttering and final placement of concrete. Clean if required. See Preprufe Plus Application Manual for more details or contact Tech Service.

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 Plus and tape all edges with Preprufe Tape. Remove plastic release liner from Tape.

## Installation - Vertical

Apply the membrane with the green zip strip facing towards the concrete pour. 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 Plus. Any exposed fixings should be patched with Preprufe Tape. Peel back and remove both the green and blue zip strips in the overlap area to achieve an adhesive to adhesive bond at the overlap. Ensure a continuous bond is achieved without creases and roll firmly. On completion of the installation, completely remove the plastic zip strips from all overlaps and Tape.

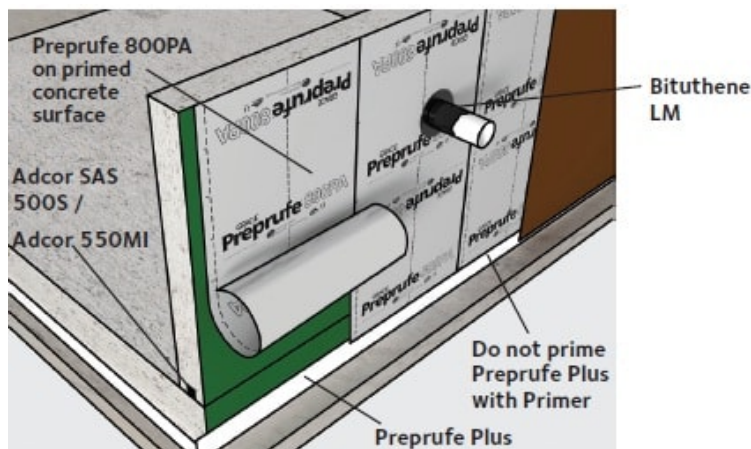
## Removal of Formwork

Preprufe Plus 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 Plus. A minimum concrete compressive strength of 10 N/mm<sup>2</sup> is recommended prior to stripping formwork supporting Preprufe Plus membranes. Premature stripping may result in loss of adhesion between the membrane and concrete.

## Wall Waterproofing Options

GCP also offers alternatives to pre-applying Preprufe Plus 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 Plus below slabs

## Preprufe Plus Preparation When Preprufe 800PA Is Used on Walls

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

## Health and Safety

There is no legal requirement for a Safety Data Sheet for Preprufe Plus. For Bituthene LM read the product carton and Safety Data Sheet (SDS) before use. Users must comply with all risk and safety phrases. SDS's can be obtained from GCP Applied Technologies or from our web site at [gcpat.com](http://gcpat.com).

|   |   |
|---|---|
|  | GCP Applied Technologies<br>Ipswich Road, Slough, Berkshire SL1 4EQ<br>United Kingdom<br>13 09/F017   |
|   | EN 13967<br>Preprufe® 160R Plus and 300R Plus Flexible Sheets for Waterproofing, Type T<br>Reaction to fire: E Watertightness: Pass at 60 kPa |

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