

PREPRUFE® GMS (Gas Mitigation System)

Pre-applied waterproofing and gas vapor barrier membrane that bonds integrally to poured concrete for use below slabs or behind basement walls on confined sites

Product Description

Preprufe® GMS membrane is a unique composite sheet comprising a thick HDPE film, an aggressive pressure sensitive adhesive and a weather resistant protective coating. Unlike conventional non-adhering membranes, which are vulnerable to water ingress tracking between the unbonded membrane and structure, the unique Preprufe GMS bond to concrete prevents ingress or migration of water around the structure.

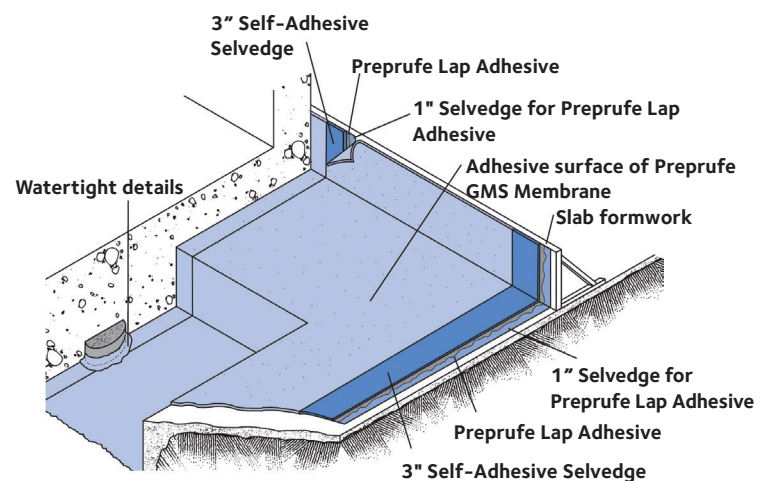
In addition to superior waterproofing protection, the Preprufe GMS membrane is specially designed to prevent methane and other hazardous gas vapors from entering the building through the foundation slab or other part of the structure.

Product Advantages

- **Forms a unique continuous adhesive bond to concrete poured against it**—prevents water migration and makes it unaffected by ground settlement beneath slabs
- **Provides a barrier to water, moisture and gas**— physically isolates the structure from the surrounding ground
- **Fully-adhered watertight laps** and detailing
- **Zero permeance** to moisture
- **Solar reflective**—reduced temperature gain
- **Simple and quick to install**—requiring no priming or fillets Drawings
- **Can be applied to permanent formwork**—allows maximum use of confined sites
- **Self protecting**—can be trafficked immediately after application and ready for immediate placing of reinforcement
- **Unaffected by wet conditions**—cannot activate prematurely
 - Inherently waterproof, non-reactive system
 - not reliant on confining pressures or hydration
 - unaffected by freeze/thaw, wet/dry cycling
- **Chemical resistant**—effective in most types of soils and waters, protects structure from salt or sulphate attack

The Preprufe GMS System includes:

- **Preprufe GMS**—heavy-duty grade membrane for use below slabs, and on rafts (i.e. mud slabs) and for blindside applications against soil retention systems. Designed to accept the placing of heavy reinforcement using conventional concrete spacers.
- **Preprufe Lap Adhesive**—two-component adhesive used for sealing side laps, cut edges and roll ends (minimum temperature 25 °F (-4 °C)).
- **Preprufe Tape LT**—for covering cut edges, roll ends, penetrations and detailing (temperatures between 25 °F (-4 °C) and 86 °F (30 °C)).
- **Preprufe Tape HC**—as above for use in Hot Climates (minimum 50 °F (10 °C)).
- **Preprufe CJ Tape LT**—for construction joints, repairing and detailing (temperatures between 25 °F (-4 °C) and 86 °F (30 °C)).



Drawings are for illustration purposes only. Please refer to gcpat.com for specific application details.

- **Preprufe CJ Tape HC**—as above for use in Hot Climates (minimum 50 °F (10 °C)). • Bituthene Liquid Membrane— for sealing around penetrations, etc.
- **Adcor ES**—waterstop for joints in concrete walls and floors
Preprufe Tieback Covers—preformed cover for soil retention wall tieback heads
- **Preprufe Preformed Corners**—preformed inside and outside corners

Preprufe GMS is applied either horizontally to smooth prepared concrete, well rolled and compacted earth or crushed stone substrate; or vertically to permanent formwork or adjoining structures. Concrete is then cast directly against the adhesive side of the membranes. The specially developed Preprufe adhesive layers work together to form a continuous and integral seal to the structure.

Application Procedures

Safety, Storage and Handling Information

All construction products must be handled properly. SDS (Safety Data Sheets) are available at gcpat.com and users should acquaint themselves with this information. Carefully read detailed precaution statements on product labels and the SDS before use.

Installation

The most current application instructions, detail drawings and technical letters can be viewed at gcpat.com. For other technical information contact your local GCP representative. Preprufe GMS is supplied in rolls 4 ft (1.2 m) wide, with a selvedge on one side to provide self-adhered laps for continuity between rolls. The rolls of Preprufe Membrane and Preprufe Tape are interwound with a disposable plastic release liner which must be removed before placing reinforcement and concrete.

Substrate Preparation

All surfaces—It is essential to create a sound and solid substrate to eliminate movement during the concrete pour. Substrates must be regular and smooth with no gaps or voids greater than 0.5 in. (12 mm). Grout around all penetrations such as utility conduits, etc. for stability (see Figure 1).

Horizontal—The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. The surface does not need to be dry, but standing water must be removed.

Vertical—Use concrete, plywood, insulation or other approved facing to sheet piling to provide support to the membrane. Board systems such as timber lagging must be close butted to provide support and not more than 0.5 in. (12 mm) out of alignment.

Membrane Installation

Preprufe can be applied at temperatures of 25 °F (–4 °C) or above. When installing Preprufe in cold or marginal weather conditions <55 °F (<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.

Horizontal substrates—Place the membrane HDPE film side to the substrate with the clear plastic release liner facing towards the concrete pour. End laps should be staggered to avoid a build up of layers. Leave plastic release liner in position until overlap procedure is completed. Apply a minimum ¼ in. bead of Preprufe Lap Adhesive along the side lap's plastic selvedge between the HDPE film and the release liner before attempting to overlap (See Figure-1). Accurately position succeeding sheets to overlap the previous sheet by 4 in. (100 mm) along the marked selvedge.

Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller. Completely remove the plastic liner to expose the protective coating. Any initial tack will quickly disappear. Refer to GCP Tech Letter 15 for information on suitable rebar chairs for Preprufe.

Vertical substrates—Mechanically fasten the membrane vertically using fasteners appropriate to the substrate with the clear plastic release liner facing towards the concrete pour. The

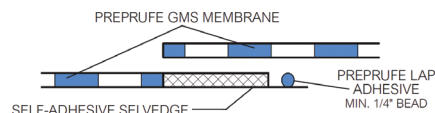


Figure-1—Side Lap

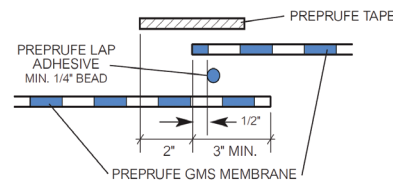


Figure-2—End Lap (Cut Edges)

membrane may be installed in any convenient length. Fastening can be made through the selvedge using a small and low profile head fastener so that the membrane lays flat and allows firmly rolled overlaps. Immediately remove the plastic release liner. Apply a minimum ¼ in. (6 mm) bead of Preprufe Lap Adhesive along the side lap's plastic selvedge between the HDPE film and the release liner before attempting to overlap (see Figure-1).

Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap onto previous sheet's self-adhesive selvedge and Preprufe Lap Adhesive. Roll firmly to ensure a watertight seal.

Roll ends and cut edges—Overlap all roll ends and cut edges by a minimum 3 in. (75 mm) and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary. Allow to dry and apply a minimum ¼ in. (6 mm) bead of Preprufe Lap Adhesive along all edges between the roll ends and cut edges before attempting to overlap (See Figure-2). Apply Preprufe Tape LT (or HC in hot climates) centered over the lap edges and roll firmly. Immediately remove plastic release liner from the tape.

Details

Additional Application Instructions and Detailing may be found in the Preprufe Field Application or visit gcpat.com. Examples of some standard details are:

- internal and external corners
- penetrations
- tiebacks
- columns
- grade beam pilecaps
- tie-ins
- terminations

Membrane Repair

Inspect the membrane before installation of reinforcement steel, formwork and final placement of concrete. The membrane can be easily cleaned by jet washing if required. Repair damage by wiping the area with a damp cloth to ensure the area is clean and free from dust, and allow to dry.

Repair small punctures (0.5 in. (12 mm) or less) and slices by applying Bituthene Liquid Membrane (LM) over the damaged area and extend onto the Preprufe GMS membrane by a minimum of 2 in. (50 mm) or apply a continuous bead of Preprufe Lap Adhesive around the extents of the damaged area. Apply Preprufe Tape and/or Preprufe CJ Tape centered over the application of Bituthene Liquid Membrane or Preprufe Lap Adhesive and extend onto the Preprufe GMS membrane by a minimum of 2 in. (50 mm). The Preprufe tapes may be applied over freshly installed Bituthene Liquid Membrane or Preprufe Lap Adhesive. Ensure succeeding layers of tape overlap the previous tape by a minimum of 2 in. (50 mm). Roll tape firmly and remove all release liner.

Repair holes and large punctures by applying a patch of Preprufe membrane, which extends 6 in. (150 mm) beyond the damaged area. Apply a minimum ¼ in. (6 mm) bead of Preprufe Lap Adhesive along all edges of the patch between the patch of membrane and the field of the Preprufe GMS membrane before attempting to overlap.

Any areas of damaged adhesive should be covered 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 cover with fresh Preprufe Tape, rolling firmly. Alternatively, use a hot air gun or similar to activate adhesive and firmly roll lap to achieve continuity.

Pouring of Concrete

Ensure the plastic release liner is removed from all areas of Preprufe GMS membrane and tape. It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the membrane. Concrete must be placed carefully and consolidated properly to avoid damage to the membrane. Never use a sharp object to consolidate the concrete.

Removal of Formwork

Preprufe membranes can be applied to removable formwork, such as slab perimeters, elevator and lift pits, etc. Once the concrete is poured the formwork must remain in place until

the concrete has gained sufficient compressive strength to develop the surface bond. Preprufe membranes are not recommended for conventional twin-sided wall forming systems. A minimum concrete compressive strength of 1500 psi (10 N/mm²) is recommended prior to stripping formwork supporting Preprufe membranes. Premature stripping may result in displacement of the membrane and/or spalling of the concrete. Refer to GCP Tech Letter 17 for information on removal of formwork for Preprufe.

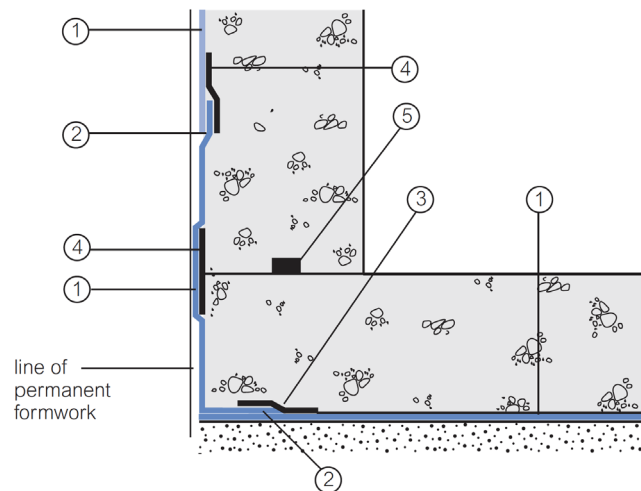
Specification Clauses

Preprufe GMS shall be applied with its adhesive face presented to receive fresh concrete to which it will integrally bond. Only GCP Applied Technologies approved membranes shall be bonded to Preprufe GMS. All Preprufe GMS system materials shall be supplied by GCP Applied Technologies, and applied strictly in accordance with their instructions. Specimen performance and formatted clauses are also available.

Detail Drawings

Details shown are typical illustrations and not working details. For a list of the most current details, visit us at gcpat.com. For technical assistance with detailing and problem solving please call toll free at 866-333-3SBM (3726).

Wall base detail against permanent shutter



- 1 Preprufe GMS
- 2 Preprufe Lap Adhesive
- 3 Preprufe Tape
- 4 Preprufe CJ Tape
- 5 Adcor

Supply

Dimensions (Nominal)	Preprufe GMS Membrane	Preprufe Tape (LT or HC*)
Thickness	0.046 in. (1.2 mm)	
Roll size	4 ft x 98 ft (1.2 m x 30 m)	4 in. x 49 ft (100 mm x 15 m)
Roll area	392 ft ² (36 m ²)	460 ft ² (42 m ²)
Roll weight	108 lbs (50 kg)	4.3 lbs (2 kg)
Minimum side/end lap	4 in. (150 mm)	3 in. (75 mm)

* LT denotes Low Temperature (between 25 °F (-4 °C) and 86 °F (30 °C)) HC denotes Hot Climate (50 °F (>10 °C))

Ancillary Products

Bituthene Liquid Membrane— 1.5 US gal (5.7 liter) or 4 US gal (15.1 liter)

Preprufe Lap Adhesive - 8.5 oz (250ml) dual cartridge caulking tube

Physical Properties

Property	Typical Value Preprufe GMS	Test Method
Color	white	
Thickness	0.046 in. (1.2 mm) nominal	ASTM D3767
Lateral Water Migration Resistance	Pass at 231 ft (71 m) of hydrostatic head pressure	ASTM D5385, modified ¹
Low temperature flexibility	Unaffected at -20 °F (-29 °C)	ASTM D1970
Resistance to hydrostatic head	231 ft (71 m)	ASTM D5385, modified ²
Elongation	660%	ASTM D412, modified ³
Tensile strength	4000 psi (27.6 MPa)	ASTM D412
Crack cycling at -9.4 °F (-23 °C), 100 cycles	Unaffected	ASTM C836
Puncture resistance	221 lbs (990 N)	ASTM E154
Peel adhesion to concrete	15 lbs/in. (2700 N/m) width	ASTM D903, modified ⁴
Water absorption	0.5%	ASTM D570
Lap peel adhesion at 25 °F (-4 °C)	9 lbs/in. (1585 N/m) width	ASTM D1876, modified ⁵
Acceptance criteria for below-grade exterior damp proofing and waterproofing materials	Pass	L021
Methane barrier test criteria	Pass	AC L137
Permeance to water vapor transmission	0.01 perms (0.6 ng/(Pa x s x m ²))	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 0.125 in. (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 2 in. (50 mm) per minute.
4. 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 2 in. (50 mm) per minute at room temperature.
5. The test is conducted 15 minutes after the lap is formed (per GCP published recommendations) and run at a rate of 2 in. (50 mm) per minute at 25 °F (-4 °C)

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