

# PERM-A-BARRIER<sup>®</sup> VPO

Fluid applied vapour permeable air barrier membrane designed for indirect and intermittent UV exposure

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## Product Description

PERM-A-BARRIER<sup>®</sup>VPO is a fluid applied, one component, acrylic membrane that provides continuous air tightness and water protection throughout the wall assembly. PERM-A-BARRIER<sup>®</sup>VPO is dark-colored and designed for exposure to indirect and intermittent sunlight, such as behind open joint rain screen systems.

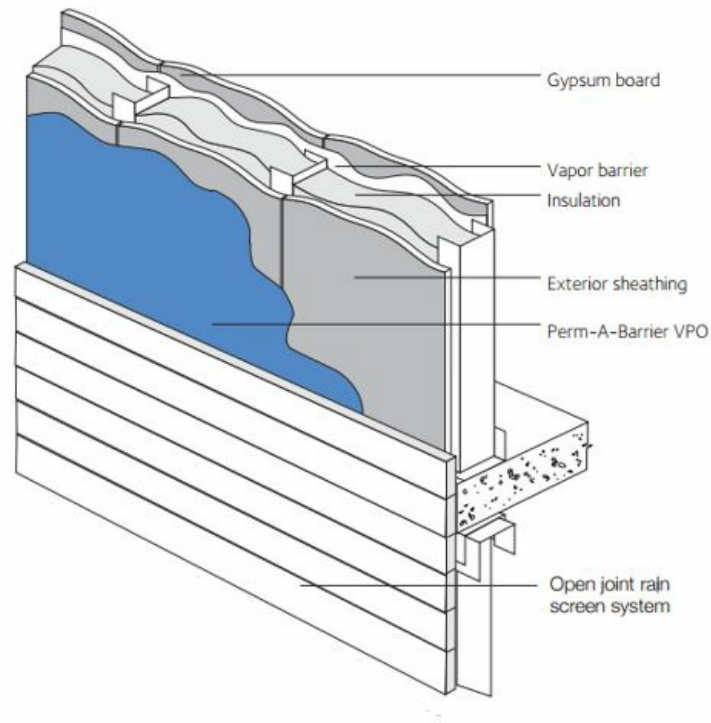
PERM-A-BARRIER<sup>®</sup>VPO is for wall assemblies requiring “breathable” characteristics. As a vapor permeable membrane, PERM-A-BARRIER<sup>®</sup>VPO permits the transfusion of water vapor that may otherwise condense in the wall structure; but is impermeable to liquid water, which allows the material to act as a water drainage plain.

The Volatile Organic Compound (VOC) content of PERM-A-BARRIER<sup>®</sup>VPO is less than 20 g/L.

## Product Advantages

- **Dark-coloured** – provides design flexibility
- **Indirect and Intermittent UV exposure** – can be used with open joint rain screen systems
- **Air tight** – protects against air passage and associated energy losses. Meets new ASTM E2357 standard
- **Vapour permeable** – prevents moisture from being trapped in the wall cavity by allowing walls the ability to dry
- **Single component** – fast and easy application with simple spray equipment
- **Fully bonded** – transmits wind loads directly to the substrate
- **Seamless** – continuous membrane integrity with no laps
- **Damp surface tolerant** – can be applied to damp-to-touch surfaces
- **Weather resistant** – can be exposed to rain, wind and direct sunlight up to a maximum of 6 months
- **Strong adhesion** – to common construction substrates such as wood, block, concrete, OSB, gypsum sheathing and metal
- **Compatible** – with PERM-A-BARRIER<sup>®</sup>Flashing Systems

Drawings are for illustration purposes only.



## Principal Applications

Vapour permeable air barrier for new and remedial commercial and residential applications requiring indirect and intermittent UV exposure such as behind open joint rain screen systems.

## System Components

- PERM-A-BARRIER® VPO - for vertical applications
- S100 Sealant - one part neutral curing, ultra low modulus silicone sealant for detailing and joint treatments
- BITUTHENE® Liquid Membrane - for details and terminations
- PERM-A-BARRIER® Wall Flashing - heavy duty fullyadhered membrane for through-wall flashing detailing
- PERM-A-BARRIER® Detail Membrane - flexible, fully-adhered membrane for detail flashing areas
- PERM-A-BARRIER® Aluminum Flashing - flexible, aluminum faced, fully-adhered membrane for detail flashing areas

## Installation

### Safety

Refer to product label and SDS (Safety Data Sheet) before use. All users should acquaint themselves with this information prior to working with the material. Carefully read detailed precaution statements on the product labels and SDS before use.

SDSs can be obtained from our web site at [gcpat.com](http://gcpat.com) or by contacting us at 866-333-3SBM (3726).

## Surface Preparation

All surfaces must be sound and free from spalled areas, loose aggregate, loose nails or screws, sharp protrusions or other matter that will hinder the adhesion or regularity of the membrane installation. The surface must also be free from frost, dirt, grease, oil or other contaminants. Clean loose dust and dirt from the surface by brushing or wiping with a clean, dry cloth.

### Concrete and Other Monolithic Cementitious Surfaces

Surface irregularities greater than 1/4 in. (6 mm) across and/or 1/8 in. (3 mm) in depth should be pre-treated with BITUTHENE® Liquid Membrane or repaired with a lean mortar mix or nonshrinking grout. Remove concrete form lines and any high spots greater than 1/8 in. (3 mm) in height to ensure uniform surface. On highly dusty or porous substrates it may be necessary to apply a scratch coat of PERM-A-BARRIER® VPO prior to spraying to full thickness.

PERM-A-BARRIER® VPO LT may be applied to green (minimum 3 day cure time) concrete or over damp to-touch surfaces. Remove any visible water prior to application.

### Concrete Masonry Units (CMU)

The CMU surface should be smooth and free from projections. Strike all mortar joints full and flush to the face of the concrete block. Fill all voids and holes, particularly at the mortar joints, with a lean mortar mix or non-shrinking grout. Alternatively, a parge coat (typically one part cement to three parts sand) may be used over the entire surface.

### Exterior Sheathing Panels

PERM-A-BARRIER® VPO may be applied directly to exterior sheathing panels such as exterior drywall, plywood and oriented strand board (OSB) and glass faced wall boards, for further information refer to Technical Letter 2, *Substrate Preparation for Application of Perm-A-Barrier Products to Glass-Mat Faced Gypsum Sheathing*. To avoid deflection at the panel joints, fasten corners and edges with appropriate screws. Fasteners should be driven flush with the panel surface (not counter sunk) and into the framing system in accordance with the manufacturers recommendations. Tape the sheathing board butt joints using either reinforced or mesh-style wallboard tape, min. 2 in. (50 mm) wide (i.e. FIBATAPE® brand products).

When using mesh-style wallboard tape, ensure that all holes in the tape are filled with PERM-A-BARRIER® VPO. Gaps greater than 1/4 in. (6 mm) should be filled with S100 Sealant. Once the sealant is tack free, the PERM-A-BARRIER® VPO may be applied.

For alternate joint treatment options refer to Technical Letter 2, *Substrate Preparation for Application of Perm-A-Barrier Products to Glass-Mat Faced Gypsum Sheathing* or Technical Letter 14, *Substrate Preparation for PERM-A-BARRIER® VP Applications*.

### Detailing

Detailing should be completed prior to applying the full coverage of PERM-A-BARRIER® VPO. The field application should completely cover the detail areas to provide a continuous membrane.

For a complete description and instructions on individual details, consult the separate detail sheets.

Transitions to beams, columns, window and doorframes, etc. should be made with a strip of Perm-A-Barrier Detail Membrane, PERM-A-BARRIER®Aluminum Flashing or PERM-A-BARRIER®Wall Flashing. Only PERM-A-BARRIER®Wall Flashing can be used for through wall flashing applications or under masonry units. Optimum adhesion will be achieved when the membrane or flashing is lapped onto the cured PERM-A-BARRIER®VPO. As soon as the PERM-A-BARRIER® VPO is cured (approximately 24 hrs after application at 50% R.H, 68°F), it is ready to accept self-adhered membranes or flashings.

Any gaps around penetrations should be caulked with BITUTHENE®Liquid Membrane or a polyurethane sealant prior to the PERM-A-BARRIER®VPO application. Refer to GCP standard penetration detail for PERM-A-BARRIER®VPL.

## Membrane Application

Perm-A-Barrier VPO can be installed through a spray application. PERM-A-BARRIER®VPO may also be applied by roller or brush, however spray application is the preferred method. If applying PERM-A-BARRIER®VPO by roller or brush, multiple material passes may be necessary to ensure that the required wet thickness is achieved.

Contact GCP for further details of local applicators, application techniques and spray equipment.

**Application Temperature** - In spray applications, PERM-A-BARRIER®VPO may be applied at temperatures as low as 40°F (4°C). PERM-A-BARRIER®VPO is not recommended for use when cold and/or damp conditions exist for prolonged periods. PERM-A-BARRIER®VPO is a water-based material. As with all water-based materials, it is subject to freezing at temperatures below 32°F (0°C).

## Thickness Control

Application thickness is controlled in vertical applications by marking the area and spot-checking the thickness with a wet film thickness gauge. Swipe marks on the surface of the PERM-A-BARRIER®VPO are acceptable as long as the minimum thickness is maintained.

## Drying

PERM-A-BARRIER®VPO is dry to touch and can be over coated within 4 hours under normal conditions (50% R.H, 68°F). PERM-A-BARRIER®VPO dries through in 24 hours at normal conditions (50% R.H, 68°F). Drying and skinning times may vary depending on temperature, humidity and surface conditions.

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## Coverage Rates

PERM-A-BARRIER®VPO is typically applied at a minimum thickness of 90 mils wet. The theoretical coverage rate (not including waste) at a thickness of 90 mils is approximately 18 ft<sup>2</sup>/gal to reach a 45 mil dry thickness.

Coverage may vary depending on application technique and may be reduced over rough and uneven substrates. The applicator goal should be a continuous membrane at a thickness of 90 mils (2.3 mm) wet, adjust coverage rate accordingly.

### Application of Insulation and Finishes

PERM-A-BARRIER®VPO is not suitable for permanent weather exposure. Insulation boards may be installed after PERM-A-BARRIER®VPO has fully cured. If the insulation cannot be applied within 6 months of the PERM-A-BARRIER®VPO application, some form of temporary protection (such as tarpaulins) should be used to protect the product from the effects of sunlight. Installation of insulation boards can be accomplished by using compatible mechanical fasteners or, solvent free insulation adhesive.

## Cleaning

Tools and equipment are most effectively cleaned with using a washing-up liquid mix of 1 oz/per gallon of water (7.5g /per litre of water). (i.e. Dawn®Ultra-2x Active Suds). This method works before material is cured. White Spirit can be used to remove cured material on tools. Flush system before its used to remove the light oil which was left from factory testing. NPL is a water base product, so a soapy water mix to prime pump is best (1-2 gallons/4-8 litres). For short shutdown periods, material can remain in equipment and delivery lines. Material should not be left in system for any period of time if temperatures are expected to drop below 40 °F (4 °C). Normal flushing of system use soapy mix until clear/clean mix is observed (stored at 40 °F (4 °C) or above).

\*\* Long-term storage, after system has been cleaned with soapy water mix, several options can be used. Grace Flushing oil, GRACO®- PUMP ARMOR™, TITAN™-LS-10 LIQUID SHIELD™ Plus or White Spirit can be pumped through system. Be sure to always pump a soapy water mix prior to priming system with VPO.

## Storage and Handling

PERM-A-BARRIER®VPO is available in 55 gallon drums and 5 gallon pails.

PERM-A-BARRIER®VPO should be stored under cover in original sealed containers above 40°F (4 °C) and below 100°F (38 °C).

The shelf life is 9 months in unopened containers.

Store opened containers with plastic protective liner covering the material.

## Limitations

PERM-A-BARRIER®VPO should not be exposed to direct sunlight, weather or traffic for more than 6 months.

PERM-A-BARRIER®VPO should not be used with open joint rain screen systems where joints are greater than 1" wide. Do not apply Perma-Barrier VPO in wet weather. Perma-Barrier VPO should not be applied if rain or temperatures below 40 °F (4 °C) are expected within 24 hours.

PERM-A-BARRIER®VPO should be kept from freezing as it is subject to freezing at temperatures below 32 °F (0 °C).

Finished and exposed surfaces should be protected from overspray.

PERM-A-BARRIER®VPO should not be used in waterproofing applications in hydrostatic condition.

PERM-A-BARRIER®VPO is not compatible with petroleum solvents, fuels and oils, materials containing creosote, pentachlorophenol or linseed oil. PERM-A-BARRIER®VPO has a maximum in-service temperature of 175 °F (80 °C).

## Physical Properties

PROPERTY	TYPICAL VALUE	TEST METHOD
Air permeance at a test pressure of 0.3 in. water (75 Pa) on CMU block	<0.0004 cfm/ft <sup>2</sup> (<0.002 L/s/m <sup>2</sup> )	ASTM E2178
Assembly air permeance at test pressure of 1.57 psf (75 Pa) <sup>1</sup>	<0.0008 cfm/ft <sup>2</sup> (<0.004 L/s/m <sup>2</sup> )	ASTM E2357
Water vapour transmission	11.2 perms	ASTM E96 - method B
Peel adhesion to concrete block (CMU)	20 lbs/in.	ASTM D903
Peel adhesion of PERM-A-BARRIER® Wall Flashing	3 lbs/in.	ASTM D903
Peel adhesion to glass faced wall board <sup>2</sup>	5 lbs/in.	ASTM D903
Pull adhesion to glass faced wall board <sup>2</sup>	50 psi	ASTM D4541
Pull adhesion to concrete	200 psi	ASTM D4541
Tensile strength	300 psi	ASTM D412 - Die C
Elongation	300%	ASTM D412 - Die C
Colour	Very Dark Green	
Solids content	50% (approx.)	
Density	8.6 lbs/gal	
Drying time @ 50% R.H. 68°F - initial set <sup>3</sup>	4 hours	
Drying time @ 50% R.H. 68°F (20 °C)	24 hours	
Weather resistance	6 months	ASTM D412, ASTM E96-method B (After 6 months UV exposure)
Nail sealability	Pass	ASTM D1970
Low temperature flexibility and crack bridging -15°F (at -26 °C)	Pass	ASTM C836

### Footnotes:

Results below detectable limits of laboratory equipment.

Failure occurs when glass facing pulls away from gypsum core.

Drying and skinning times may vary depending on temperature, humidity and surface conditions.

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