

# **Below Grade Waterproofing Membranes**

## **Polyguard 650 Waterproofing Membrane**

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### **1. Technical Description**

Polyguard 650 Membrane is a strong, pliable, self adhering sheet membrane consisting of high strength polyethylene backing laminated to a thick layer of rubberized asphalt. 650 Membrane adheres tightly and permanently to concrete. The polyethylene sheet forms a continuous barrier impervious to water. The adhered rubberized asphalt prevents lateral migration of any water which might find its way behind the sheet. Total membrane thickness is factory controlled at 60 mils.

#### **Basic Uses**

Polyguard 650 Membranes are used on concrete for foundation waterproofing, mud slabs, tunnels, plaza decks, planters and related applications where waterproofing is critical. Polyguard Membranes may also be used on wood and concrete block structures. Wide membrane widths allow fast and easy application to continuous flat surfaces. Narrow width material is available for trim corners, construction joints and other applications.

#### **Advantages and Benefits**

- Labor saving film release sheet guarantees faster installation than any other self adhering sheet membrane.
- A "Margin of Safety" in several important areas with the 60% higher peel adhesion strength than other competitors. Polyguard 650 has an extended edge of adhesive waterproofing compound beyond the end of the polyethylene sheet. Polyguard's edge is up to 50% wider than other membranes. And Polyguard's edge is tapered to insure smooth transition at laps.

### **2. Typical Properties**

Polyguard	Test Method	Typical
Film Color	Visual	Grey/Black
Membrane Thickness	Micrometer	60 Mils
Tensile Strength-Membrane	ASTM D-412(Modified Die C) - PSI	325
Tensile Strength- Film	ASTM - D-882 - PSI	6500
Elongation	Ultimate failure of rubberized asphalt - ASTM D-412	600%
Permeance	ASTM E-96 (Method B) - grains/sq.ft./hr./in. HGF	.05
Cycling Over Crack	-15° ASTM C836	No effect
Peel Adhesion	ASTM D-1000 lbs./inch width	12.0
Overlap Bond	ASTM D-1000 lbs./inch width	10.0
Pliability	ASTM D-146 - 180° bend over 1" mandrel at - 25°  (650LT) and -15° (650P)	Pass
Puncture Resistance- Membrane	ASTM-E 154 (Blunt instrument) Lbs.	40
Resistance to Hydrostatic Head	ASTM-D 5385 Head Ft. of water	231
Exposure to Fungi in Soil	GSA-PBS 07115 - 16 weeks	No effect
Water Absorption	ASTM D-570 % by weight	.1

### ***3. Vertical Application***

Concrete walls must be cured for 7 days, minimum. Structural Lightweight Concrete is more porous, lighter concrete retains more water, a 14 day cure is a must. This is necessary to dissipate the water needed for conveyance and hydration. Application of the waterproofing before the allowed cure time may cause excessive bubbling of the membrane because of out gassing of the moisture.

Foundation walls of concrete and block must be smooth and monolithic. Broom surfaces are not recommended. Surface must be free of voids, spalled areas, sharp projections, loose aggregate and form release agents. Concrete curing compounds containing oil, wax or pigments should not be used. Form releases must be the self dissipating type which will not transfer to the concrete. Surface holes or cavities should be filled and finished flush with a portland cement grout or concrete (*parget coat*).

**Vertical and Horizontal inside corners** must be addressed with a fillet using the Polyguard #95 Liquid Membrane (*do not prime surfaces before application of #95 LM*) with a 3/4" face, or a polymer modified grout. This allows a sloped area for the membrane to attach to in the corners instead of a 90° angle, which could leave a trap for water to migrate if the membrane is not pressed in the corner well enough. Apply liquid adhesive to surface and apply the 12" strip of 650 Membrane centered on the corner.

**All inside and outside corners** must be addressed prior to field application with Polyguard 650 Liquid Adhesive and a 12" strip of membrane centered on the corner. Another application that is acceptable is the use #95 Liquid Membrane 6" in all directions at 90 mils in place of the 12" strip of membrane before application of 650 Membrane.

All surfaces to receive the 650 Membrane must be primed with liquid adhesive at a rate of 250-350 square feet/gallon. All areas not covered within the same working day with 650 Membrane must be reprimed.

Membranes may be applied vertically as well as horizontally. Vertical applications are the most common placements, with lifts of up to 8'. Walls over 8' should be shingled layered in lifts. Side laps must be 2 1/2" and end laps must be 6". All seams must be rolled with a wall type narrow roller. Use heavy hand pressure while smoothing out the membrane surface, as it is applied. 650 Mastic **must** be used on all exposed cut ends of the membrane, terminations and at the base of the footing.

A protection system must be used against the membrane for protection from debris of the backfill and construction traffic. Protection systems may be applied directly to the waterproofing membrane with Polyguard 650 Liquid Adhesive, Gibson Holmans Sure Stik, Miracle 297 or Liquid Nails.

**APPROVED VERTICAL PROTECTION SYSTEMS** by Polyguard are:

- Polyguard Low Flow Protection and Drainage
- 1/4" or greater extruded Fan-Fold insulation
- 1" or greater expanded or extruded polystyrene insulation board.
- 1/8" or 1/4" asphaltic hardboard can be used specifically where high puncture resistance is needed from the backfill. But, because of its difficulty to apply and the extra weight it places on the membrane, the extruded or expanded polystyrene systems are recommended.

**UNAPPROVED SYSTEMS** by Polyguard are:

- Cardboard saturated panels **MAY NOT** be used.

Drainage systems are used to relieve the hydrostatic head of water pressure from the wall. Some drainage systems may be applied directly to the waterproofing membrane with Gibson Holmans Sure Stik, Miracle 297 or Liquid Nails.

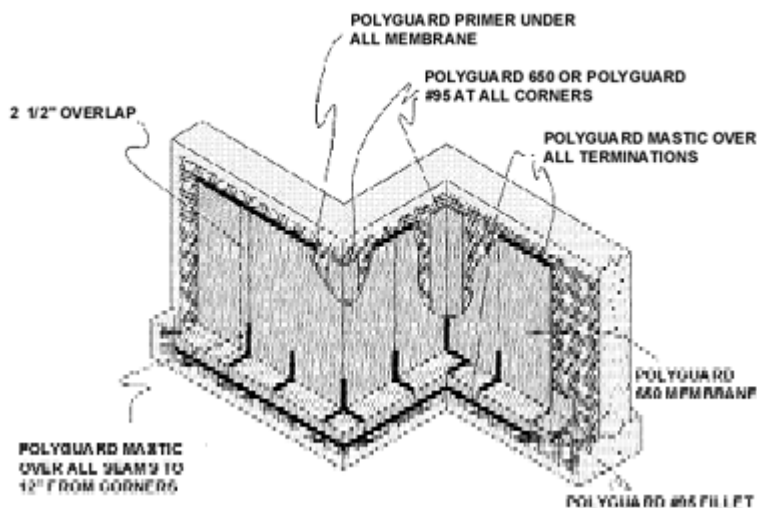
**APPROVED VERTICAL DRAINAGE SYSTEMS** for use as drain board without a separate protection board system are:

- Polyguard **LowFlow** Protection/Drainage System

- Polyguard FLOW 15-P
- J-Drain 1000
- J-Drain 420
- Monsanto Hydraway WD300
- EOS Drain Systems (Geotech)
- AmerDrain 520
- Hydroduct 2
- Miradrain 6200

***APPROVED DRAINAGE SYSTEMS*** without protection board to a MAXIMUM OF 10' DEPTH.  
Below 10' protection board is required are:

- J-Drain 302
- Exxon Battle Drain Plus
- Miradrain 6000
- Enka Drain 9010



**VERTICAL APPLICATION (Shown Above)**

#### **4. Horizontal Application**

Concrete surfaces must be cured for 7 days, minimum. Structural Lightweight Concrete is more porous, lighter concrete retains more water, a 14 day cure is a must. This cure time is necessary to dissipate the water needed for conveyance and hydration. No lightweight insulated concrete. Application of the waterproofing before the allowed cure time may cause excessive bubbling of the membrane because of out gassing of the moisture.

Cold joints, T-joints and evident working cracks should be properly sealed with joint fillers, water stop or sealant. Cracks wider than 1/16th of an inch must be pre-treated with a 12" strip of membrane. Control joints must be filled with #95 Liquid Membrane before the 12" pre-strip.

All expansion joints, contraction joints and control joints should be properly sealed with joint fillers, water stop or sealant. An inverted 8" (203 mm) strip, shall be placed directly over the joint, covered with a 12" strip of membrane *adhesive side down* centered over the 8" strip before the final membrane application. If over 1/2" of movement is designed, an appropriate expansion joint system must be specified.

All surfaces to receive the 650 Membrane must be primed with liquid adhesive at a rate of 250-350 square feet/gallon. All areas not covered within the same working day with 650 Membrane must be reprimed.

On the horizontal surfaces, apply membrane from low to high pitch for maximum drainage. Use linoleum roller or water filled garden roller, covered with two plies of indoor-outdoor carpet to roll membrane immediately after application, with special attention at overlaps and "T-joints". Seal all end laps with Polyguard 650 Mastic at the end of each work day.

***Horizontal and vertical inside corners*** must be addressed with a fillet using the Polyguard #95 Liquid Membrane with a 3/4" face, or a polymer modified grout. ***(Do not prime surfaces before application of #95 LM)***. This allows a sloped area for the membrane to attach to in the corners instead of a 90° angle, which could leave a trap for water to migrate if the membrane is not pressed in the corner well enough.

***All inside and outside corners*** must be addressed prior to field application with Polyguard 650 Liquid Adhesive and a 12" strip of membrane centered on the corner. Another application that is acceptable is the use #95 Liquid Membrane 6" in all directions at 90 mils in place of the 12" strip of membrane before application of 650 Membrane.

Drains must be properly designed with mechanical clamping rings and weepholes at the membrane level.

On the horizontal surface, apply membrane from low to high pitch for maximum drainage. Use linoleum roller or water filled garden roller, covered with two plies of indoor-outdoor carpet to roll membrane immediately after application, with special attention at overlaps and "T-joints". Seal all end laps with Polyguard 650 Mastic.

After the waterproofing applications is complete and inspected for any problem spots the area can be flood tested with 2" head of water for a 24 hour period.

Topping, such as concrete, soil or pavers, may be used to finish a horizontal application. Multi level drainage systems are recommended at both topping and Polyguard 650 Membrane level. If using thin set grout to apply tile as a topping and *Acrylic Latex Ad-Mixture* must be used. This helps with the adhesion to the polyethylene backing of the membrane. On tile application protection systems are not necessary.

A protection system must be applied as soon as possible after the membrane application and water test is complete.

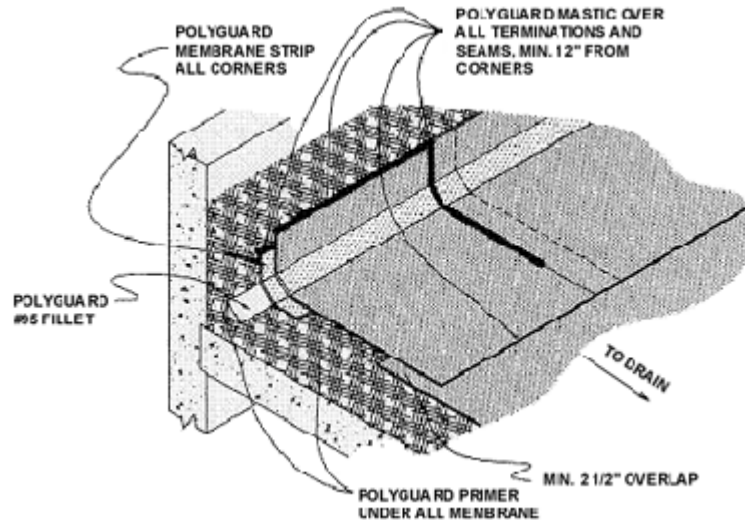
***APPROVED HORIZONTAL PROTECTION SYSTEMS*** by Polyguard are:

- 1/8" asphaltic hardboard for normal construction traffic.
- 1/4" asphaltic hardboard protection system is to be used when structural steel and heavy

rebar is to be placed over the membrane.

**APPROVED DRAINAGE SYSTEMS** approved by Polyguard:

- Polyguard 18H



**HORIZONTAL APPLICATION (Shown Above)**

### **5. Specifications**

Polyguard 650 conforms to the following specifications:

- FCGS-07111
- GSA PBS 07111
- NAVFAC TS-07111
- Corps of Engineers CEGS-07111-3-82
- Veteran's Administration H-08-1 Section 07113
- American Railway Engineering Association AREA 29-2
  - AIA MASTERSPEC Section 07115

### **Packaging**

4' x 50 foot rolls - 200 sq. ft. per carton - 25 cartons per pallet

### **Limitations**

Porous surfaces may adversely affect adhesion. 650 Membrane is not recommended for pond or tank liners except when applied between two concrete slabs.

Caution should be taken to prevent contact of the rubberized asphalt element with any product containing fresh coal tar or coal tar pitch. Sealants and liquid waterproofing products containing

polysulfide polymer may be incompatible.

Polyguard 650 Membrane can be adversely affected by ultraviolet light. The waterproofing system must be covered as soon as possible and not left exposed to sunlight for over 30 days.

## **6. Accessories**

- 650 LT LIQUID MEMBRANE is a fast drying, high tack rubber based adhesive in solvent solution used to prepare surface for 650 Membrane. 650 LT Liquid Adhesive is available for use at temperatures 25°F (-4°C) and rising. Liquid Adhesive is applied with brush or lambs wool roller. 650 LT Liquid Adhesive is available in 1-5 gallon pail or 4-1 gallon pails to carton. Coverage rate of 250 - 350 sq. ft. per gallon. Waterbase and low VOC adhesives also available.
- 650 MASTIC is a rubberized asphalt mastic with a low solvent content is used to terminate membranes, provides a positive seal at the top of the membranes, on the footing base, at penetrations, and at overlaps in the membrane. 650 Mastic should **NEVER** be applied under the 650 Membrane. Coverage is 100 Lin Ft./Gal. of 1" wide bead. The tubes cover 65 Lin. Ft. of 1/2" bead. Mastic is supplied in 5 gallon pails and 30oz. tubes (12/Case).
- 95 LIQUID MEMBRANE is a two-component elastomeric extended rubber urethane, mixed prior to application. LM-95 is used with 650 Sheet Membrane to eliminate double-sheet on inside and outside corners, as a fillet on inside corner, pipe penetrations and in planter boxes where sheet membrane application is difficult. LM-95 is available in 2 gallon pails. Coverage rate is:

Fillet only: 65-75 Lin/Ft./Gal.

Fillet plus 6" on horizontal: 14 Lin.Ft./Gal.

Flashing: 90 mil 17 Sq. Ft./Gal.

- **LOWFLOW** PROTECTION/DRAINAGE BOARD is a high-strength, multi layer fabric composite. Used to protect underlying waterproofing membranes and provide a low cost drainage mat which, with a flow rate of 0.84 gal/min/ft., is suitable for most soil conditions. **LOWFLOW** is supplied in rolls 4' x 200' (800 sq. ft).
- FLOW 15-P and 18-H PROTECTION/DRAINAGE SYSTEM is a two part prefabricated geocomposite drain consisting of a formed polystyrene core covered on one side with polypropylene filter fabric. This allows water to pass into the drain core while restricting the movement of soil particles which might clog the core. Both are supplied in rolls 4' x 50' (200 sq. ft.). The primary difference in the use of the products is that 15-P is used for vertical surfaces, 18-H is used on horizontal surfaces.



Div. 07100 650 Membrane Specifications

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