POLYGUARD UNDERSEAL®

UNDERSLAB WATERPROOFING MEMBRANE

Waterproofing with Added Protection Against
Radon, Methane, Insects, and other Contaminants

U. S. Patent No. 7,488,523 and 7,686,903

PRODUCT FEATURES:

BASIC USES: ***Underseal® Underslab Membrane*** is used as a waterproofing membrane/vapor barrier to virtually eliminate water and vapor transmission through concrete slabs on grade. In addition to protecting floor finishes and indoor air quality, ***Underslab Membrane*** also acts as a barrier to termites, pesticides, methane gas and radon gas.

DESCRIPTION: ***Underslab Membrane*** is a strong sheet membrane with a 20 mil thick high strength polyethylene geomembrane topped with a 55 mil thick layer of proprietary waterproofing sealant integrated into a high strength nonwoven geotextile fabric.

On the fabric side, a 4" wide lap of waterproofing adhesive compound is left exposed along one edge with a removable silicone coated release sheet. This adhesive is exposed just prior to the installation of the adjacent roll, which creates a 4" wide **self-adhesive overlap** seam. Total membrane thickness is factory controlled at **95 mils**.

ATTRIBUTES: ***Underslab Membrane*** creates a permanent seal underneath the concrete slab.

1. A strong mechanical bond is formed when the concrete, at time of pouring, intermingles with the fibers of the nonwoven geotextile.
2. A strong adhesive bond is created when the static load of the concrete slab causes the sealant/adhesive compound to "cold flow" throughout all remaining voids between the fabric and the underside of the concrete slab. (*See the McGraw-Hill Dictionary of Architecture and Construction for a definition of cold flow).*
3. If cracks develop in the base material or the slab, ***Underslab Membrane's*** stress-absorbing and elongation properties allow it to maintain a watertight seal to the structure.
4. ***Underslab Membrane*** has a puncture resistance of 310 lbs., which is 64 times higher than Class A Vapor Barrier requirements *(2200 grams, or under 5 lbs)*. With the abuse caused by concrete trucks and motorized equipment driving over rebar during concrete placement, and the foot traffic and tools used during placement and vibration, high puncture resistance is critical to underslab vapor barrier protection.
5. The architectural community is aware of how "anti-fracture membranes' use a stress-absorbing layer to reduce cracking in ceramic tile flooring. In the same way ***Underslab Membrane*** will absorb stress from movement or cracking of the base material underneath the slab, reducing the potential for stress-related concrete cracking.
6. The membrane features fully-adhered watertight laps and details.
7. ***Underslab Membrane*** remains functional if jobsite conditions become challenging. Rainfall, freeze/thaw and wet/dry cycling do not affect the system.
8. ***Underslab Membrane*** also acts as a barrier against termites, toxic contaminants, methane gas and radon which may attempt to enter the structure through cracks in the concrete.

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Polyguard is ISO 9001 certified since 1996.

Underslab Membrane may be installed vertically on removable formwork for waterproof protection for perimeter and grade beam installations as well as on elevator pits, etc. The membrane may also be installed vertically against adjoining structures to provide waterproofing protection. Generally, for most vertical wall applications ***Polyguard*** recommends the installation of ***Underseal Protected Wall Waterproofing Membrane, Blindside Waterproofing Membrane or Polyguard 650 Membrane***, depending on project conditions, but occasionally the membrane can be vertically placed. Consult ***Polyguard*** for vertical recommendations.

LIMITATIONS: ***Underslab Membrane*** should normally be installed when temperatures are 40°F (*4°C)* and rising. For low temperature use between 25°F – 39°F applicator must contact ***Polyguard*** for procedures. This membrane should always be installed when the weather is dry. This product should not be installed when it is raining or when freezing precipitation is occurring. Standing water must be removed prior to concrete being poured on ***Underslab Membrane***. Consult ***Polyguard Products*** for material handling and storage requirements. Concrete must be poured on installed membrane within 30 days after installation. Extended exposures will be considered, please contact ***Polyguard*** for technical assistance.

REFERENCES: ***Underseal® Underslab Waterproofing Membrane*** qualifies under LEED IAQ Credit 5 - Indoor Chemical and Pollutant Source Control (below grade toxin barrier/reduced pesticide usage). SS3 - Brownfield redevelopment (can be used for pesticide contaminated sites), Can be considered for ID-1 - Innovation in design.

PACKAGING:

PRODUCT	ROLL SIZE	PACKAGING	SQ.FT./ ROLL	LBS. /ROLL	CTNS / PALLET
Underslab Waterproofing Membrane	4' x 50'	CARTON	200	80	22 CTNS
Underseal Fabric Tape	12" x 200'	CARTON	200	70	24 CTNS

SAFETY: ***Polyguard*** liquid adhesives, mastics and liquid membrane products used along with this product can contain varying amounts of solvents and other substances which could be hazardous if not handled safely. Hazards can include breathing vapors, flammability, skin irritation, and toxicity. It is important that users obtain from ***Polyguard*** current Material Safety Data Sheets, and follow with care all safety instructions related to the products. Of particular importance is the presence of adequate ventilation, and the absence of excessive heat, flame, or sparks in areas where the products are stored, handled, or applied. **CLOSE CONTAINER AFTER EACH USE. KEEP OUT OF REACH OF CHILDREN.**

PRODUCT PLACEMENT:

PREPARATION: Level, tamp or roll granular base prior to application of ***Underslab Membrane***. Sub-base compaction should be accomplished per project specifications. Surface debris such as rocks, trash, concrete chunks, roots, sticks, etc. need to be removed. The membrane should never be placed in standing water. Surface must be dry prior to application.

INSTALLATION: Place the ***Underslab Membrane*** with the polyethylene geomembrane backing toward the soil with the fabric facing up to receive the concrete. The membrane should be placed with the longest dimension parallel with the direction of concrete pour. ***Underslab Membrane*** should be lapped over the concrete footings and slab perimeter/grade beams to insure a tight bond with the concrete pour. All penetrations should be sealed.

PENETRATIONS - If the annular space of pipe through an opening is ½" or less apply ***Polyguard 650 LT Liquid Adhesive or California Sealant*** to the fabric side of ***Underslab Membrane.*** Apply a cant / fillet with a min. 3/4" face of ***Polyguard LM-95 Liquid Membrane*** or ***Polyguard Detail Sealant*** extending onto the fabric side of the ***Underslab Membrane*** and onto the pipe a minimum of 3". The pipe surface should be cleaned and roughened with sandpaper or a wire brush to insure adequate adhesion. Allow ***Polyguard Detail Sealant*** 24 hours to cure.

Note: If pipes or penetrations are in tight clusters and a more flowable detailing liquid is required ***LM-95*** should be used, contact ***Polyguard*** for more details.

If the annular space of pipe through an opening exceeds ½" a patch of ***Underseal® Fabric Tape*** is required. Apply a patch of ***Underseal Fabric Tape*** 6" larger than the pipe diameter using the ***Polyguard 650 LT Liquid Adhesive or California Sealant*** at a rate of 150 - 200 sq. ft. per gallon (13.93 - 18.58 M^2). Extend 6" beyond pipe to the fabric side of the ***Underslab Membrane***. Press the ***Underseal Fabric Tape*** firmly to obtain full adhesion to the ***Underslab Membrane***. Apply a heavy coat 150 - 200 sq. ft. per gallon (13.93 - 18.58 M^2) of the ***Polyguard 650 LT Liquid Adhesive or California Sealant*** to the ***Underseal Fabric Tape*** patch. While the ***Polyguard 650 LT Liquid Adhesive or California Sealant*** is still tacky, seal the pipe with the ***Polyguard LM-95 Liquid Membrane or Polyguard Detail Sealant***. Apply a cant/ fillet with a min. 3/4" face of ***Polyguard LM-95 Liquid Membrane or Polyguard Detail Sealant*** extending onto the fabric side of the ***Underslab Membrane*** and onto the pipe a minimum of 3". Allow ***Polyguard Detail Sealant*** to cure 24 hours. Pipe surfaces must be free from dirt and other contaminants that could act as bond breakers. Cleaning with a wire brush is one acceptable method of surface preparation.

TERMITE AND GAS VAPOR PROTECTION - For full termite and gas vapor protection all pipes must be wrapped using the ***Underseal Fabric Tape*** and secured to the pipe with a screw clamp.

SIDE LAPS – If any lap areas become dirty during construction remove all debris and/or dust from the polyethylene backing. Clean the backing with 30% isopropyl alcohol prior to exposing the 4" self-adhesive seam. Remove the 4" wide silicone treated release sheet and align the adjacent roll for seaming. Once the lap is secured, roll with a min. 75 lb. linoleum roller to obtain full adhesion.

END LAPS - The ***Underslab Membrane*** overlap must be 4". Center a 12" wide piece of ***Underseal® Fabric Tape*** over the seam, extend a mimimum 6" on each side of lap in a heavy coat 150 - 200 sq. ft. per gallon (13.93 - 18.58 M^2) of tacky ***Polyguard 650 LT Liquid Adhesive or California Sealant.*** Apply even pressure with the linoleum roller to obtain full adhesion.

PATCHING - Take precautions to protect the ***Underslab Membrane*** during placement of reinforcing steel and concrete. Visually inspect the membrane prior to pouring of concrete for any punctures or damage to membrane which needs to be repaired. Patch any damaged areas using ***Underseal Fabric Tape*** installed over ***Polyguard 650 LT Liquid Adhesive or California Sealant*** at a coverage rate of 150 - 200 sq. ft. per gallon (13.93 - 18.58 M^2) to the damaged ***Underslab Membrane.*** Patches must extend a minimum of 6" in all directions from the damaged area. All patches must be rolled with a hand roller or linoleum roller to insure proper adhesion and seal. Repaired areas must be sealed around the edges with ***Polyguard 650 Mastic.***

REBAR CHAIRS: Steel reinforcement may be applied directly over the ***Underslab Membrane***. It is of important that reinforcement (rebar) chairs are compatible with the system. Compatible rebar chairs will distribute the load of the steel reinforcement sufficiently that to reduce the risk of the chair puncturing the waterproofing membrane when fully loaded with the weight of the reinforcement steel and other common auxiliary loads.

On compacted earth, stone or mud slabs - concrete or brick (blocks, pavers, or dobies) rebar supports are recommended. However, on mud slab applications steel chairs or beam bolsters are acceptable as long as they have plastic caps or are plastic dipped. Prior to slab pour all standing water must be removed from the membrane.

OWNER INSTRUCTIONS: This material is offered for sale by ***POLYGUARD PRODUCTS, INC.*** only for the expressed purposes as described in this literature. Any use of the products other than taught here by ***POLYGUARD*** shall be the responsibility of the purchaser, and ***POLYGUARD*** does not warrant, nor will be responsible for any misuse of these products.

The ***POLYGUARD*** products described here are for construction or industrial use only. Application of the products should be performed by workmen who are skilled in the application of these types of materials, and installation should follow manufacturer specifications.

Material Safety Data sheets and precautionary labels should be read and understood by all user supervisory personnel and employees before using. Consult ***POLYGUARD*** for Material Safety Data Sheets. Purchaser is responsible for complying with all applicable Federal, State and local laws and regulations covering health, safety, and use of the product, including waste disposal. This is not a Material Safety Data Sheet and is not to be used as such. ***POLYGUARD*** has prepared separate Material Safety Data Sheets on each product.

WARRANTY: ***Polyguard Products*** are warranted to be free of defects in manufacture for five years. Material will be provided at no charge to replace any defective products.

TYPICAL PRODUCT PROPERTIES:

PROPERTY	TEST METHOD	ENGLISH	METRIC
Color		Black/White	
Thickness	ASTM D-1000	.095 in.	*1.86 cm*
Low temperature flexibility	ASTM D 1970 180° bend over 1" mandrel at -20°F (-29°C).	No effect	*No Effect*
Resistance to hydrostatic head, minimum	ASTM D 5385	231 ft.	*70 m*
Hydraulic Transmissivity of a Geosynthetic Using a Constant Head	ASTM D 4716	No measurable flow	*No measurable flow*
In Plane Hydraulic Transmissivity of a Geosynthetic by Radial Flow	ASTM D 6574	No water flow	*No water flow*
Elongation, rubberized asphalt sealant/adhesive component	ASTM D 412	839%	*839%*
Breaking Strength of 1" width sample Polyethylene Geomembrane layer	ASTM D 882	87.6 lb	*39.7 kg*
Tensile Strength of 1" width Polypropylene Geotextile layer	ASTM D 4632	80.0 lb	*36.3 kg*
Crack cycling at -10°F (-23°C), 100 cycles	ASTM C 836 Tested @-15°F	No effect	*No effect*
Puncture resistance, minimum	ASTM E 154 Membrane using 1" *(24mm)* Rod Lb. *(N)*	321 lb	*1428 N*
Peel adhesion to concrete	ASTM D 903 lb/in width *(N/mm)*	31.3 lb	*3561 N/mm*
Lap peel adhesion	ASTM D 1876 (modified[1] die C) lb/in width *(N/mm)*	8.7 lb	*983 N/mm*
Permeance to water vapor transmission, maximum	ASTM E 96-B US perms *(ng/(Pa x s x m^2)*	.01	*0.6*
Water absorption, maximum	ASTM D 570	.1%	*.1%*
Methane Permeability	ASTM D 1434 tested using 99.99% purity methane $Ft^3/(ft^3 \cdot hr \cdot psi)$ *($mol/m^3 \cdot s \cdot Pa$)*	6.3×10^{-7}	*3.5×10^{-13}*
Resistance to Penetration by Termites	Texas A&M Method - percentage of penetration	0.0 %	*0.0%*
Resistance to Penetration by Pesticides	ASTM F 2130 - percentage of penetration	0.0 %	*0.0%*
Resistance to Fungi in Soil	GSA-PBS 07115 - 16 Weeks	No effect	*No effect*
Resistance to Permeance by Radioactive Radon Gas	Radon Reduction Technology Laboratory Method 1	2.1×10^{-14}	*N/A*
Resistance to Diffusion by Radioactive Radon Gas	Radon Reduction Technology Laboratory Method 1	$5.08\ 10^{-8}$	*N/A*