

UNDERSEAL® CRM™

Sheet Chemical Resistant, Vapor and Waterproofing Membrane

MANUFACTURER

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PRODUCT DESCRIPTION

Basic Uses

Underseal® CRM™ (Chemical Resistant Membrane) is a robust pre-applied membrane that has been designed and tested to withstand elevated concentrations of soil, water and vapor contaminants. When installed below the slab and behind vertical walls, CRM creates a barrier preventing water & vapor from transmitting into the structure.

FEATURES & BENEFITS

- Creates a continuous seal underneath the concrete slab and behind vertical “blindside” cast in place concrete walls.
- Forms a strong mechanical bond when the concrete, at time of placement, intermingles with the fibers of the embedded nonwoven geotextile fabric.
- Creates a strong adhesive bond when the static load of the concrete causes the proprietary compound to have an intimate contact with the concrete surface. The CRM™ System has been tested to ensure no water migration occurs between membrane and concrete.
- CRM™ has an enhanced puncture resistance of 256 lbs. which protects the installed membrane from abuse caused by construction methods, i.e. steel placement, rebar chairs, normal foot traffic, and regular vibration.
- Features fully adhered, watertight, chemical and vapor resistant seams, end laps, penetrations and associated details.
- Provides a barrier that has been designed and tested to withstand elevated concentrations of contaminants typically found in construction sites which may be considered brownfield projects.

COMPOSITION & MATERIALS

CRM™ is a strong sheet membrane with purpose-built, multi-component, proprietary chemical resistant backing laminated to a thick layer of proprietary waterproofing adhesive compound integrated into a high-strength, nonwoven geotextile fabric. Total membrane thickness is factory controlled at 85 mils.

Underseal® CRM™ features a 4-inch-wide factory seam of exposed waterproofing adhesive compound along one edge with a removable silicone-coated release sheet. Utilizing the factory-controlled seam along with the 10” wide chemical resistant tape seams and transitions are virtually indestructible.

Structural walls must be poured in-place concrete.

TECHNICAL DATA

See physical properties table.

INSTALLATION

Substrate Considerations

Horizontal - CRM™ may be installed horizontally over prepared subbases such as compacted soil, mud slab, or #57 Stone – project substrate acceptance required prior to membrane installation. Drainboard or protection board may be required.

Vertical – Acceptable substrates (1) Soil Retention Systems ie: timber lagging, Cementitious (shotcrete), native soil. (2) Removable Form work (3) Adjoining structures. Project substrate acceptance required prior to membrane installation.

Acceptable vertical installations include (1) on removable formwork for chemical, vapor and waterproofing protection for perimeter and grade beam installations, (2) on elevator pits, or (3) against adjoining structures to provide chemical, vapor and waterproofing protection.

The CRM™ is typically installed vertically over one of the below-mentioned substrates.

Timber Lagging

Timber lagging systems should be closely butted together (not greater than 2-inch gap) to provide a sound substrate. Make sure all lagging boards are installed flush and in plane within 1/2-inch. Repair missing or damaged lagging boards with concrete grout, treated wood, or both. Fill or cover all gaps between lagging boards exceeding 2 inches using concrete grout or plywood. If lagging boards are placed interior to the steel pile, then cover any gaps between the ends of the boards which exceed 2-inches with plywood, then secure or grout for stability.

Steel Sheet Piling

If the membrane is to be in continuous contact with the profile of the sheet piling, all sharp protrusions must be addressed or removed. If waterproofing is expected to span the sheet pilings, then place 3/4-inch plywood across the void and mechanically anchor into place every 12-inches O.C. Fill void behind plywood with sand.

Caisson

Caissons need to be flush filled with flowable fill or faced with plywood to ensure a smooth sound substrate.

Shotcrete Retention System

Remove all sharp protrusions and fill all voids with concrete grout. The concrete surface profile should be between CSP- 1 and CSP-9.

HORIZONTAL SURFACE PREPARATION

- Level, tamp or roll granular base prior to application of CRM™ - typical 95 proctor.
- Complete sub-base compaction per job specifications.
- Remove surface debris, including rocks (greater than 3/4-inch), trash, concrete chunks, roots, and sticks.
- Provide a dry surface prior to application; i.e. never place the membrane in standing water or install in inclement weather.

- Remove standing water from membrane prior to concrete being poured on CRM™.

VERTICAL SURFACE PREPARATION

- Complete the soil retention system per project specifications and proceed with the Underseal CRM installation after the soil retention system has been accepted by Polyguard.
- Remove surface debris and protrusions such as rocks, trash, concrete chunks, roots, sticks, etc.
- Never install in inclement weather.

MEMBRANE APPLICATION

In horizontal applications, place the CRM™ with the silver, chemical resistant backing toward the subbase over Polyflow® 18 Drainage Composite.

In vertical applications, install CRM™ with the silver, chemical resistant backing over Polyflow® 15 Drainage Composite. Place the CRM™ on the wall with the chemical resistant backing side toward the Polyflow® 15. Fasten the top end of a lift, through the Polyflow® and into the lagging wall, using fasteners appropriate for the substrate with 6 - inch spacing across the top and 2-inches from the side laps.

Install CRM™ when temperatures are 40° F (5° C) and rising.

Penetrations

Construct a 6-inch, fast-set concrete well around all pipe penetrations. CR™ Seam Tape can replace the concrete well. Clean and roughen the pipe surface with sandpaper or a wire brush to insure adequate adhesion. Position CRM™ in place around penetration. Remove CRM™ and apply 90 mils of CR™ Liquid Membrane on the concrete well a minimum of a 4-inch radius around the penetration. Place the CRM™ into the wet CR Liquid membrane. Prime the fabric side of the sheet membrane with CR™ Sealant a minimum of a 6-inch radius around the penetration. Apply 90 mils of the CR™ Liquid Membrane over all primed fabric and 3-inches onto the penetration surface. Allow to cure for a minimum 2 hours.

If pipes or penetrations are in tight clusters, use CR™ Liquid Membrane and CR™ Sealant; refer to CRM™ details. Pipes cannot be touching each other or wired together.

Factory Seams Horizontal

If any lap areas become dirty during construction, remove all debris and/or dust from the silver chemical resistant backing. Clean the silver, chemical resistant backing of the overlapping surface with 30% isopropyl alcohol prior to exposing the 4-inch self-adhesive seam. Apply Polyguard CR™ Seam Tape. Align the adjacent roll of CRM™ for seaming then remove the 4-inch-wide silicone release sheet. Once the lap is secured, roll with a min. 75 lb. linoleum roller for horizontal surfaces and a 6-inch laminate-type roller for vertical surfaces to obtain full adhesion.

Factory Seams Vertical

If any lap areas become dirty during construction, remove all debris and/or dust from the silver chemical resistant backing. Clean the silver, chemical resistant backing of the overlapping surface with 30% isopropyl alcohol prior to exposing the 4-inch self-adhesive seam. Apply Polyguard CR™ Seam Tape to previously applied CRM™ and pull away from drainboard. Apply a 12" coating of a low-rise spray adhesive and seal to drainboard. Align the adjacent roll of CRM for seaming then remove the 4-inch-wide

silicone release sheet. Once the lap is secured, roll with a 6-inch laminate-type roller to obtain full adhesion.

End Laps Horizontal

The CRM™ overlap must be 4-inches. Apply CR™ Seam Tape between the end of the roll before proceeding onto the new roll. Apply a heavy coat 50 – 75 sq. ft. per gallon of CR™ Sealant to the fabric face of the underlayment a minimum of 6-inches wide. Apply 90 mils of CR™ Liquid Membrane over 4-inches of the primed fabric. Wet apply the new roll of CRM™. Apply another heavy coat 50 – 75 sq. ft. per gallon of CR™ Sealant. Apply another 90-mil layer of CR Liquid Membrane to both surfaces then center a 12-inch-wide piece of Fabric Tape over the seam; extend a minimum of 6-inches on each side of lap. Once the lap is secured, roll with a min. 75 lb. linoleum roller for horizontal surfaces and a 6-inch laminate-type roller for vertical surfaces to obtain full adhesion.

End Laps Vertical

For End Laps in center of lifts, spray a 12" wide area of a low-rise spray adhesive onto the Polyflow 15 and onto the non-adhesive side of the CR Seam Tape. Allow all adhesive to flash off then press CRM and CR Seam Tape together. Remove the film from the CR Seam Tape, exposing the sticky compound, and apply CRM to half of the CR Seam Tape, leaving a tail for connection to succeeding piece of CRM. Install a reverse shingle lap with the CRM on the vertical wall at a maximum of a 4-inch overlap and a minimum of 3-inches. Prime end laps with a heavy coat of CR Sealant at a rate of 50 – 75 sq. ft. per gallon, then cover the CR Sealant with a minimum 90 mils of CR Liquid Membrane. Lay the CRM into the wet CR Liquid Membrane. Place a 12-inch-wide piece of Fabric Tape over the sealed end lap after priming the end lap with 650 LT Liquid Adhesive or California Sealant at a rate of 50 – 75 sq. ft. per gallon. Center the Fabric Tape over the end lap and extend a minimum of 6-inches onto previous applied sheets. Apply even pressure with a roller to obtain full adhesion. Seal top edge of Fabric Tape with a minimum 30 mils of Detail Sealant PW or LM-95.

For end lap securement at top of lift, apply a temporary fastener 12-inches above the top of the lift and fasten. Prior to applying the next lift of material, cut material from the anchor and follow the installation instructions listed for end laps in center of lifts. Maximum lift height is 16-feet.

Preformed Corners

CR™ Inside Corner Boots 12" x 12" x 12", CR™ Outside Corner Boots 6" x 6" x 6" and CR™ Pit Top Corner Boots 6" x 6" x 6" are required. Refer to CRM™ details for installation instructions.

Patching

Take precautions to protect the CRM™ during placement of reinforcing steel and concrete. Prior to pouring of concrete, visually inspect for any punctures or damage to membrane which needs to be repaired. Patch any damaged areas less than 3/4-inch in size by expanding the hole to allow CR™ Liquid Membrane and CR™ Sealant to be applied thru the sheet onto backside of CRM™ coating inner asphalt surface. Then apply CR Liquid Membrane over the fabric surface coated with CR Sealant at a coverage rate of 50 –75 sq. ft. per gallon to the damaged CRM™.

For patches greater than 3/4-inch in size, open membrane and apply CR™ Seam Tape to the silver chemical resistant underside of the underlayment a minimum of 6-inches in all directions from the damaged area. Apply CR™ Liquid

Membrane over the fabric surface coated with CR™ Sealant at a coverage rate of 50 – 75 sq. ft. per gallon. Apply a Fabric Tape over damaged and repaired area. Apply even pressure with previously stated roller type.

Rebar Chairs

Steel reinforcement may be applied directly over the CRM™. It is important that reinforcement (rebar) chairs are acceptable with the CRM system. Acceptable (rebar) chairs will distribute the load of the steel reinforcement sufficiently to reduce the risk of the chair puncturing the CRM™ when fully loaded with the weight of the reinforcement steel and other common auxiliary loads.

Blocks, pavers or dobies made of concrete or brick are the best choice. Individual chairs are acceptable as long as they have a flat base or bolsters with rails. Contact Polyguard Technical Service for approval and written acceptance for other types of rebar chairs.

STORAGE AND HANDLING MATERIAL HANDLING

Carefully unload and store membrane and accessories. Protect cartons and containers from weather, sparks, flames, excessive heat, cold and lack of ventilation. DO NOT stack membrane and accessory material(s) higher than 5' vertically, nor double stack pallets. Store cartons on pallets and cover to prevent water damage. For best results, store membrane and accessories above 50° F (10° C) prior to application.

PRECAUTIONS

CRM™ is adversely affected by prolonged ultraviolet light. The membrane must be covered as soon as possible and not left exposed to sunlight for over 30 days. Extended exposures may be considered; contact Polyguard for technical assistance.

This product should not be installed when it is raining or when freezing precipitation is occurring.

CR™ Liquid Membrane and CR™ Sealant are industrial coatings and would be harmful or fatal if swallowed. It is marked as red label from the standpoint of flash point. Prohibit flames, sparks, welding and smoking during application; as well as around the installed membrane. Refer to product label for handling, use and storage precautions. Avoid prolonged contact with skin and breathing of vapor or spray mist from liquid adhesive. In confined areas, use adequate forced ventilation, fresh air masks, explosion-proof equipment and clean clothing.

SAFETY

SDS documents for all Polyguard products can be obtained at our website www.polyguard.com. Call Polyguard Products, Inc. at (214) 515-5000 with questions.

WARRANTY

We, the manufacturer, warrant only that this product is free of defects, since many factors which affect the results obtained from this product are beyond our control; such as weather, workmanship, equipment utilized and prior condition of the substrate. We will replace, at no charge, product proved to be defective within twelve (12) months of purchase, provided it has been applied in accordance with our written directions for uses we recommend as suitable for this product. Proof of purchase must be provided. A five (5) year material or system warranty may be available upon request. Contact Polyguard Products, Inc. for further details.

TECHNICAL SERVICES

Technical assistance, information and Polyguard's products are available through a nationwide network of distributors and architectural representatives, or contact Polyguard Products, Inc. P.O. Box 755, Ennis, TX 75120-0755 Sales: (615) 217-6061•Tech Support: (214) 515-5000 Email: archtech@polyguard.com Website: www.polyguard.com

PROPERTY	TEST METHOD	TYPICAL VALUE
FILM COLOR		Black/Silver
MEMBRANE THICKNESS	ASTM D 1000	85 mils
TENSILE STRENGTH OF 1" WIDTH	ASTM D 4632	440 lbs.
HYDRAULIC TRANSMISSIVITY OF A GEOSYNTHETIC USING A CONSTANT HEAD	ASTM D 4716	No measurable flow
(IN-PLANE) HYDRAULIC TRANSMISSIVITY OF A GEOSYNTHETIC BY RADIAL FLOW	ASTM D 6574	No water flow
BREAKING STRENGTH OF 1" WIDTH SAMPLE	ASTM D 882	14,220 PSI
ELONGATION - ULTIMATE FAILURE OF RUBBERIZED ASPHALT	ASTM D 412	839%
PERMEANCE TO WATER VAPOR TRANSMISSION	ASTM E 96 Method B	0.02 Perms
CRACK CYCLING	ASTM C 836 Tested @ -15° F	No effect
PEEL ADHESION TO CONCRETE	ASTM D 903	31.3 lbs./in.
LAP PEEL ADHESION	ASTM D 1876	8.7 lbs./in.
LOW TEMPERATURE FLEXIBILITY	ASTM D 1970 180° bend over 1" mandrel at -20° F (-29° C)	No effect
PUNCTURE RESISTANCE (MINIMUM)	ASTM E 154	256 lbs.
RESISTANCE TO HYDROSTATIC HEAD (MINIMUM)	ASTM D 5385	231 ft.
EXPOSURE TO SOIL FUNGI	GSA-PBS 07115 (16 weeks)	No effect
RESISTANCE TO PERMEANCE BY METHANE GAS	ASTM D 1434 tested using 99.99% purity	< 5 x 10 ⁻¹⁶ mol/m ² •s•Pa
RESISTANCE TO RADIOACTIVE RADON GAS	Radon Reduction Technology Laboratory % reduction in radon gas diffusion	97.10%
WATER ABSORPTION (MAXIMUM)	ASTM D 570	0.1%

CHEMICAL VAPOR TRANSMISSION (AT 75°F, 90% RH)		
GAS AND VAPOR		
METHANE	ASTM D 1434	0.0028 Perms
HYDROGEN SULFIDE	ASTM F 739	7.183 x 10 ⁻⁷ Perms
WATER VAPOR TRANSMISSION	ASTM E 96 Method B	0.054 Perms
FUELS		
GASOLINE	ASTM E 96 Method B	0.192 Perms
DIESEL	ASTM E 96 Method B	0.165 Perms
ETHANOL	ASTM E 96 Method B	0.351 Perms
ISOOCTANE	ASTM E 96 Method B	0.471 Perms
CHLORINATED SOLVENTS	Test Methods & Results Upon Request	
ORGANIC SOLVENTS	Test Methods & Results Upon Request	
ASTM D 543 CHEMICAL RESISTANCE (7 DAYS TOTAL IMMERSION)		
CHEMICAL	PHYSICAL APPEARANCE	WEIGHT CHANGE
WATER	No swelling or delamination	0.24%
OILS & FUELS	PHYSICAL APPEARANCE	WEIGHT CHANGE
MOTOR OIL	No swelling or delamination	- 0.02%
DIESEL	No swelling or delamination	0.74%
ETHANOL	No swelling or delamination	0.14%
ISOOCTANE	No swelling or delamination	3.27%
GASOLINE	No swelling or delamination	4.49%
ORGANIC SOLVENTS	Test Methods & Results Upon Request	

PACKAGING	PART NUMBER	UNIT SIZE
UNDERSEAL® CRM™	850CR	48" x 50' roll
Required Accessories:		
FABRIC TAPE	UNDERSEAL FABRIC TAPE	12" x 200' roll
CR™ SEAM TAPE	CR SEAM TAPE	4 • 10" x 200' rolls
CR™ LIQUID MEMBRANE (A & B yields 1.5 Gallons)	CR LIQUID MEMBRANE-1.5 GA	2-gallon pail
CR™ SEALANT (A & B yields 3 Gallons)	CR SEALANT-3 GA	5-gallon pail
CR™ INSIDE CORNER BOOT 12" X 12" X 12"	CR 12" INSIDE CORNER BOOT	10 pcs/ctn
CR™ OUTSIDE CORNER BOOT 6" X 6" X 6"	CR 6" PREFABRICATED BOOTS	10 pcs/ctn
CR™ PIT TOP CORNER BOOT 6" X 6" X 6"	CR 6" PREFABRICATED BOOTS	10 pcs/ctn
Possible Accessories:		
ULTRA CRM™	650L48 CR	48" x 50' roll
Drainage Accessories:		
POLYFLOW® 15	POLYFLOW15	4' x 50' roll
POLYFLOW® 18	POLYFLOW18	4' x 50' roll

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