



THOROSEAL®

Cement-based waterproof coating for concrete and masonry



Advantages

- Breathable - Allows interior moisture to escape without damaging coating
- Waterproof - Protects building interiors from dampness and moisture damage
- Resists both positive and negative hydrostatic pressure - Will not "blow off" exposed side of wall
- Compatible with high performance coatings - Accepts a wide range of architectural coatings and textured finishes
- NSF approved - Can be used in potable water tanks
- Hides minor surface defects and blemishes in architectural concrete

Where to Use Thoroseal®

- Cast-in-place and precast concrete
- Block, brick, and porous stone
- Above and below grade
- Basement and retaining walls
- Foundations
- Interior and exterior
- Vertical and light pedestrian
- Bridges and tunnels
- Cisterns and cooling towers
- Alternative to mechanical finishing or rubbing of concrete

How to Apply Thoroseal®

Surface Preparation

- 1 Surface preparation is extremely important for proper adhesion. Substrates must be sound, and free of dust, dirt, laitance, paints, oils, grease, curing compounds, or any other contaminants. Verify substrate has properly cured. Concrete should obtain 80% of design strength, typically achieved within 3 to 14 days. If efflorescence is present, mechanically remove it before proceeding. For extreme cases where this is not adequate, contact Technical Service.
- 2 All holes and cracks must be patched before installation.
- 3 Relieve hydrostatic pressure in concrete block with weep holes.
- 4 Extremely smooth surfaces such as precast and cast-in-place concrete will require roughening or brush blast to ensure good adhesion of Thoroseal®.

Mixing

- 1 Thoroseal® is to be mixed with a mixing liquid consisting of a blend of Acryl GO® diluted with water. Maximum dilution ratio is 1 part Acryl 60® to 3 parts water. Approximately 6 quarts of mixing liquid is needed per 50 lbs. of Thoroseal® powder. Up to two additional quarts of mixing liquid may be added when using as a rubbing compound. Thoroseal® is best mixed with a slow speed drill and paddle. Add the powder to the mixing liquid while drill is running.
- 2 When properly blended, Thoroseal® will have the consistency of smooth, heavy batter. The mixed Thoroseal®/Acryl 60® should be allowed to rest undisturbed for a minimum of 10 minutes to fully wet out all the powder. The wet mix should then be remixed and applied. A small amount of mixing liquid can be added to this remixing.

Pot life is 60 to 90 minutes at 70°F (21 °C). At high temperatures and low relative humidity, pot life can be significantly less.

Application

- 1 Thoroseal® may be applied with a Thoro brush or broom or equivalent stiff fiber brush, or by textured spray equipment. Spray applications require back brushing or brooming to properly fill voids and achieve uniformity.
- 2 The substrate must be completely dampened with water before application starts. Do not saturate the substrate, but keep it cool and damp throughout the application.
- 3 It is essential that the first coat be thoroughly worked into the substrate to completely fill and cover all voids, holes, and nonmoving cracks. Finish with a horizontal stroke for an even coat.

Allow to cure 24 hours, then apply the second coat and finish with a vertical stroke. Above grade, the second coat can be replaced with a Thoro® high-build architectural coating to achieve better color uniformity.

4 On block or masonry walls, allow 5 - 7 days before applying second coat to eliminate joint read through.

Specific Applications

Above-grade interior or exterior applications in positive pressure situations (direct contact with rain or standing water with a low head of pressure): a 50 lb. (22.7 kg) bag of Thoroseal® will provide the following coverage at the designated material usage.

Recommended coverage: First Coat - 2 lbs. per sq. yd. (1.1 kg/m²) = 225 ft² per 50 lb. bag.

Second Coat - 1 lb. per yd² (0.54 kg/m²) = 450 ft² per 50 lb. bag. Total 3 lbs. per sq. yd., cured nominal thickness of 1/16" (1.6 mm).

Coverage will vary depending on surface texture and porosity. A 3 lbs. per sq. yd. (1.6 kg/m²) application rate does not eliminate surface irregularities such as struck mortar joints. To hide surface irregularities, a base coat of Thoroseal® at 2 lbs. per sq. yd. (1.1 kg/m²) should be used and allowed to cure for 5 to 7 days. This should then be overlaid with a top coat of sprayed and back troweled Thoroseal® Plaster Mix at an application rate of 9 lbs. per sq. yd. (4.9 kg/m²).

Below-grade interior applications: the standard application is 3 lbs. per sq. yd. (1.6 kg/m²). For high hydrostatic pressure conditions (over 15 psi), increase application rate to 4 lbs. per sq. yd. (2.2 kg/m²) and waterproof from the positive side wherever possible.

Below-grade exterior applications: use Thoroseal® Foundation Coating. For high hydrostatic pressure conditions (over 15 psi), apply a base coat of Thoroseal® Foundation Coating at 2 lbs. per sq. yd. (1.1 kg/m²) and allow to cure for 5 to 7 days. Then apply a top coat of Thoroseal® Plaster Mix at 12 lbs. per sq. yd. (6.5 kg/m²). A steel trowel finish is recommended. For both below-grade interior and below-grade exterior applications it is recommended to cut out and place a Waterplug® cove at the wall/floor junction prior to the application of the Thoroseal® base coat.

Thoroseal® can be covered with extruded polystyrene insulation board for below-grade applications. The board must be fully coated with Thoroseal® and embedded into the still-wet coating already in place on the walls. Care must be exercised when placing the coated board since moving or sliding of the board is not possible. Once placed, do not move the board. After curing, the above-grade portion of the boards can be prepared by roughening or removal of the surface skin and then coating with Thoroseal® to protect them from UV light degradation.

Waterproofing potable water tanks or reservoirs: completely wash down the fully cured Thoroseal® with saline solution (salt brine, 12.5% salts in water). Leave saline solution on the entire Thoroseal® surface for at least 24 hours. Rinse off saline solution completely. If needed, reapply saline solution until final rinse water is completely clean and clear.

Color Uniformity

With any cementitious product, such as Thoroseal®, it may be difficult to achieve color uniformity due to weather and substrate variability. For this reason, it may be necessary to apply a top coat of a Thoro® architectural coating.

Clean Up

Promptly clean hands and all tools with warm water while product is still wet. Cured material may only be removed mechanically.

For Best Performance

- Thoroseal® must be modified with Acryl 60® to achieve the properties listed in the technical data section.
- Do not apply to substrates with active water leaks or moving cracks; patch all leaking static cracks and holes with Waterplug®. Repair any other nonmoving cracks or voids with the appropriate Thoro® repair product, and repair all moving cracks or voids with appropriate sealant.
- Maintain or place expansion and control joints as necessary.
- Do not apply in rain or when rain is expected within 24 hours. Do not apply above 90°F (32°C) or below 40°F (4°C) or when temperatures are expected to fall below 40°F (4°C) within 24 hours. For hot and cold temperature applications, store Thoroseal®, Acryl 60® and water at 50°F (10°C) to 70°F (21°C) before use.
- Variations between inside and outside temperatures may result in condensation on below grade walls treated with Thoroseal®. This can be alleviated by assuring that adequate ventilation exists.
- Windy, dry, or hot conditions may require rewetting of Thoroseal® during cure and the use of polyethylene barriers.
- Before specifying Thoroseal® for water-retaining structures, conduct tests to determine water quality. Thoroseal® is not intended for continuous contact with acid or sulfate-containing water. Very soft water will have an adverse effect on Thoroseal®.
- Service temperatures: Immersion, up to 140°F (60°C); cleaning water, up to 200°F (93°C); dry air, up to 220°F (104°C)
- On all projects, it is recommended that a sample be prepared on site and approved prior to the commencement of the work. The site sample should confirm the color, texture and workmanship required until the job is finished and accepted. Retain the sample until final approval is secured.
- Allow Thoroseal® to cure 7-10 days before immersion in water.
- Make certain the most current version of this data guide is being used; call Customer Service (1-800-433-9517) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by ChemRex® personnel are for the purpose of making technical recommendations only and are not for supervising or providing quality control on the jobsite.

Technical Data

Physical or Performance Property	Test Method	Typical Value
Positive resistance to hydrostatic pressure Air cured, 70°F (21°C), 50% relative humidity	CRD C 48 (modified)	752 hours at 200 psi (1.4 MPa) (461 head ft.) No leakage, no softening
Negative resistance to hydrostatic pressure Air cured, 70°F (21°C), 50% relative humidity	CRD C 48 (modified)	664 hours at 200 psi (1.4 MPa) (461 head ft.) Limited dampness
Compressive strength	ASTM C 109	7 days = 4200 psi (29 MPa) 28 days = 6030 psi (42 MPa)
Flexural strength	ASTM C 348	7 days = 360 psi (2.5 MPa) 28 days = 1027 psi (7 MPa)
Tensile strength	ASTM C 190	7 days = 250 psi (2 MPa) 28 days = 440 psi (3 MPa)
Modulus of elasticity	ASTM C 469	28 days = 2.72×10^6 psi (1.87×10^4 MPa)
Coefficient of thermal exp.	ASTM C 531	28 days = 6.99×10^{-6} in/in/°F (5×10^{-7} mm/mm/°C)
Artificial weathering	ASTM G 26 (Xenon Arc) ASTM G 23 (Carbon Arc)	5000 hours = No failure 500 hours = No failure
Impact strength (Gardener impact tester)	Fed. Spec. TT-P-0035 (Cement paints para. 3.4.8)	No chipping
Wind driven rain	(para 4.4.7)	8 hours = excellent
Artificial weathering	Atlas Type DMC weatherometer	No cracking, loss of adhesion, check or other defect
Hardness (Barber Coleman Impressor)	Fed. Spec. TT-P-0035 (para 4.4.9)	7 days = 35 14 days = 47, 21 days = 52 requirement min. = 30, max. = 60
Fungus resistance	Fed. Spec. TT-P-29B	21 days = No growth, meets all requirements
Abrasion resistance	Fed. Spec. TT-P-141b	3000 litre sand = Passed
Surface burning characteristics	ASTM E 84	Flame Spread 0, Smoke developed 5
Fire Propagation (British standard)	BS476:Part 6:1981	Index = 1.5
Flame spread	BS476:Part 7:1971	Class 1
Permeance	ASTM E 96 (Water vapor transmission) Swedish standard SS-02-15-82	Perms = 12 Metric permeability = 0.10698 18×10^5 resistance
Freeze/thaw resistance	ASTM C 666 (Procedure B)	200 cycles = No change
Water absorption	ASTM C 67 (Section 7.3)	Boiling water submersion at 24 hours = 3.6%
Reflectance	ASTM D 2244 using Hunterlab D-25 meter	Gray Thoroseal®: 64.2 White Thoroseal®: 88.1
Salt spray resistance	ASTM B 117	300 hours = No defect
Adhesion strength	Test by tensile bond	418 psi (2.9 MPa)
Initial Set	Lab value	10 minutes at 70°F (21°C), 50% RH
Final Set	Lab value	90 minutes at 70° F (21°C), 50% RH
Density (cured)	Lab value	129 lbs./cu. ft. (2080 kg/m ³)
Potable water (direct contact)	BS6920 (British standard) NSF Standard 61	Suitable Approved
Carbon Dioxide (CO ₂)	Lab value Diffusion	1/16" (1.6 mm) Equivalent to 3/4" (19 mm new concrete)

Test results are averages obtained under laboratory conditions. Reasonable variations can be expected.

Order Information

Packaging

Thoroseal®

- 30 lb. (13.6 kg) polyethylene-lined bags
- 50 lb. (22.7 kg) polyethylene-line bags
- 60 lb. (27.2 kg) pails

Acry60®

- 1 qt. (0.9 L) bottles
- 1 gal. (3,8 L) bottles
- 5 gal.d8.9L) pails
- 30 gal.d13.5L) drums
- 55 gal. (208 L) drums

shelf Life

Transport and store Thoroseal® in original containers and Keep in a dry condition protected from rain, dew and humidity. Do not stack bags more than pallets high. If dry onsite storage of bags is unavailable, or if project is located in a very wet, humid climate zone, then specify Thoroseal® packaged in 60 lb. (27.2 kg) metal pails. Store Acry60® in similar conditions. Do not allow Acry60® to freeze.

If stored under proper conditions, shelf life is 12 months for bags and pails.

Color

Thoroseal®

- White
- Gray (This product is not color uniform)
- Pearl gray
- 10 standard Elements colors
- Special colors available, minimum order of 5000 lbs. (2268 kg)

Caution

Thoroseal® contains calcium hydroxide, crystalline silica, iron (III) oxide monohydrate, Portland cement, calcium sulfate

Risks

Products is alkaline on contact with water and may cause injury to skin or eyes. Ingestion or inhalation of dust may cause irritation. Contains small amount of free respirable quartz which has been listed as a suspected human carcinogen by NTP and IARC. Repeated or prolonged overexposure to free respirable quartz may cause silicosis or other serious and delayed lung injury.

Precautions

KEEP OUT OF THE REACH OF CHILDREN. Avoid contact with skin, eyes and clothing. Prevent inhalation of dust. Wash thoroughly after handling. Keep container closed when not in use. DO NOT take internally. Use only with adequate ventilation. Use impervious gloves, eye protection and if the TLV is exceeded or used in a poorly ventilated area, use NIOSH/MSHA approved respiratory protection in accordance with applicable federal, state and local regulations.

First Aid

In case of eye contact, flush thoroughly with water for at least 15 minutes. In case of skin contact, wash affected areas with soap and water. If irritation persists, SEEK MEDICAL ATTENTION. Remove and wash contaminated clothing. If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION.

For more information see Material Safety Data Sheet (MSDS) for this product.

Proposition 65

This product does not knowingly contain material listed by the state of California as known as to cause cancer, birth defects or other reproductive harm.

VOC Content

0 g/L or 0.00 lbs/gal less water and exempt solvents.

For medical emergencies only, call ChemTrec (1/800/424-9300).

Limited warranty Notice

Every reasonable effort is made to apply ChemRex® exacting standards both in the manufacture of our products and in the information which we issue concerning these products and their use. We warrant our products to be of good quality and will replace or, at our election, refund the purchase price of any products proved defective. Satisfactory results depend not only upon quality products, but also upon many factors beyond our control. Therefore, except for such replacement or refund, CHEMREX® MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, RESPECTING ITS PRODUCTS, and CHEMREX® shall have no other liability with respect thereto. Any claim regarding product defect must be received in writing within one (1) year from the date of shipment. No claim will be considered without such written notice or after the specified time interval. User shall determine the suitability of the products for the intended use and assume all risks and liability in connection therewith. Any authorized change in the printed recommendations concerning the use of our products must bear the signature of the ChemRex® Technical Manager.



ChemRex®

Corporate Office:

889 Valley Park Drive; Shakopee, MN 55379

Customer Service: 1/800/433-9517

Technical Services: 1/800/ChemRex (1/800/243-6739)

Web Site: www.chemrex.com

