CORCHEM®

TECHNICAL BULLETIN

CORCHEM® 283 ENVIRONMENTAL FINISH

GENERIC A diglycidyl ether of bisphenol-A resin reacted with a unique modified multiple ring cycloaliphatic amine adduct activator. The polymer structure is extremely tough with excellent chemical resistance and is reinforced with inert ceramic pigments.

DESCRIPTION Exceptionally attractive ceramic-like high build epoxy mastic designed to provide penetration, wetting and sealing of substrates and surfaces that will be exposed to severe chemical and physical environments. It is formulated to be extremely adhesive, hard, impact and abrasion resistant. The cured film conforms to United States Department of Agriculture requirements for coatings in incidental contact with food.

USE Steel and concrete storage vessels and reservoirs, mechanical machinery, piping and processing equipment, containment walls and floors. Provides a high degree of protection against moisture, corrosive fumes, and chemical contact. Intended for use in both field and shop operations. The principle use is for corrosion and abrasion problem areas such as industrial facilities and architectural structures. Suggested as a heavy-duty, general purpose, decorative protective lining or finish. Self-priming to steel, concrete, most substrates and poorly prepared surfaces or may be used in combination with primers such as CORCHEM® 97, 235, 254, 260, 262, MCTHANE™ 150 and many other CORCHEM® products.

SERVICE LIMITATIONS Temperature resistance up to 250°F (dry) and up to 200°F (wet) depending upon the individual exposure. CONTACT CORCHEM® FOR SPECIFIC RECOMMENDATIONS BEFORE PROCEEDING for immersion service and exposure to corrosive chemicals, elevated temperatures and/or pressures, or use with cathodic protection systems. Avoid sudden depressurization of lining. NOTE: Exterior insulation of tanks, vessels and processing equipment is recommended to prevent “cold wall effect” if interior lining is subject to elevated temperatures.

COLORS White (other colors available).

FINISH High Gloss. Finish may vary due to texture and porosity of substrate. NOTE: Subject to color change (yellowing, darkening, etc.) Chalking will occur with extended exposure to sunlight (UV).

VOLUME SOLIDS 98% (may vary depending on color selected).

VOC CONTENT 35.94 g/l or 0.30 lbs./gal. Conforms to 40 CFR §59.402 VOC content limits.

DRY COVERAGE Theoretical (no loss): 1600 sq. ft. per gallon for one mil (.001). Allow for application loss and surface irregularities when computing irregularities.

DRY FILM THICKNESS Normal / typical dry film thickness of 12 mils to 20 mils. Do not exceed 30 mils. per application coat Multiple applications may be necessary to achieve the specified or desired film thickness. Temperature, variations in design configuration, application equipment, and other factors also affect achievable millage per coat.

COMPONENTS Two. By volume 1 to 1 (Component A : Component B).
Component A is amine and Component B is resin.

PACKAGING 2-gallon, 10-gallon, & 100-gallon pre-measured, packaged kits.

SHELF LIFE 2-years from shipment date protected between 40°F and 100°F in its original sealed container.

HAZMAT DATA Hazard Class 8 – Corrosive (Component A), Hazard Class 9 – Environmentally Hazardous Substance (Component B). This material ships in any quantity via common carrier only. *Refer to individual Component's Safety Data Sheet for complete Hazmat and Safety information.*

SURFACE PREPARATION Surface should be cleaned prior to abrasive blasting as prescribed in SSPC-SP 1 or other specified methods (i.e., NACE PUB.6G186/SSPC-Guide 15).

Round off sharp edges and rough welds in accordance with NACE SP0178 or other applicable Standards, (i.e. SSPC-PA Guide 11, ISO 12944-3). Burrs and weld spatter should be completely removed. Surfaces must be clean, dry and free of any visible dirt, chalk, grease, oils, salts, and deleterious materials before application is performed. Vacuum the topside of all horizontal and sloped surfaces. Fill pitted steel by troweling CORCHEM® 263 FILLER SURFACER over pits leaving them flush with surface. Repair perforations in steel by patching or plugging with ≥3/16 inch steel using full fillet welds on large perforations and CORCHEM® 263 FILLER SURFACER as bonding adhesive on small perforations. Grind top edges of patches to a round contour.

CARBON STEEL Immersion or Severe Exposures: NACE No. 1 / SSPC-SP-5 (White Metal Blast Cleaning). Mild Exposures: NACE No. 2 / SSPC-SP-10 (Near-White Blast Cleaning). Metal surfaces should have an anchor profile of three mils (.003) or more. If metal substrate has "cavities" or "indentations" apply primer application coat and back roll to completely wet and thoroughly penetrate surface to ensure all voids and irregularities are filled.

NON-FERROUS METALS Before blast cleaning of non-ferrous metal surfaces, visible deposits of oil, grease, or other contaminants shall be removed in accordance with SSPC-SP 1 or other specified methods (i.e., NACE PUB.6G186, SSPC-Guide 15).

SSPC-SP 16 (Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals). Coatings applied to these surfaces may not achieve the same degree of adhesion and toughness.

WELDING Welding should precede coating. If already coated, follow instructions in American Welding Society, ANSI Standard Z49.1 Safety in Welding and Cutting.

CHIME AREA Apply sufficient CORCHEM® 263 FILLER SURFACER to obtain a smooth radius of 1.5 inches (or make grout by mixing 4 parts clean, dry 100 mesh silica sand with 1 part CORCHEM® 263 FILLER SURFACER). Premix grout, according to CORCHEM® 263 Technical Bulletin, in small quantities and hand apply with trowel.

CONCRETE AND MASONRY *See CORCHEM® Information Bulletin "Applying coatings to concrete substrates" for additional information.*

Concrete and masonry must cure at least 28 days. Clean and open surfaces by abrasive "brush-off" blast or by using self contained "blast track" type shot blasting equipment until concrete laitance and efflorescence are removed, (ASTM D4259-88(2012) *"Standard Practice for Abrading Concrete"*). "Blow" holes and cavities should be opened in order to properly fill and seal. Level protrusions and repair cavities, voids, and cracks. When completed, the prepared surface should meet the requirements of International Concrete Repair Institute (ICRI) Guideline 310.2 CSP 3 to CSP 4. Apply CORCHEM® 262 PRIMER SEALER or apply the first application coat of this product and back roll to completely wet and thoroughly penetrate surface to ensure that all irregularities are filled and sealed.

PRE-COATING INSPECTION Perform pre-coating inspections as required by procurement documentation.

Check for desired surface cleanliness and surface profile, (relevant standards: ASTM D4417, Method B or C / SSPC PA 17), before proceeding to coating application operations.

Soluble salt testing, if specified, refer to ISO 8502-9 or NACE SP-0508-2010, recommend NaCl limit of ≤ 50 mg/m^2 for immersion service, NaCl limit of ≤ 160 mg/m^2 for non-immersion service (IMO PSPC NACE-IMCS 2008).

POT LIFE Approximately 1 hour at 70° F (mixed 1-gallon kit). **Pot life is significantly shorter for higher temperatures or larger quantities and longer for lower temperatures**

or smaller quantities.

THINNER CORCHEM® 4. Thin only as required for proper application. Do not exceed applicable volatile organic compound (VOC) regulations. Thinner added:

05% - 41 g/l or 0.34 lbs./gal.	10% - 79 g/l or 0.66 lbs./gal
15% - 113 g/l or 0.94 lbs./gal.	20% - 145 g/l or 1.21 lbs./gal.

TEMPERATURES Apply at 35°F to 125°F (Air and Surfaces) and 5°F above the dew point. Sudden and/or substantial temperature change during curing process or in-service conditions can cause film defects.

MATERIAL MIXING In order for any lining/coating system to achieve optimal performance, the cured system must be properly crosslinked. This requires that the material be mixed at the specified ratio of Component A and Component B.

All equipment, tools, and mixing containers should be cleaned or flushed with CORCHEM® 4 THINNER prior to use. Pre-mix each component separately prior to combining as follows: **Add 1 Part Component A by volume into 1 Part Component B by volume**. No induction time is required. Power-stir until completely mixed. Strain only if required for proper application. If using equipment for mixing or application, do not allow catalyzed material to remain in equipment after use! Clean immediately with CORCHEM® 4 THINNER.

APPLICATION METHODS Plural component spray, airless spray (hot pot), conventional air spray (pressure pot), brush (small areas), roller, squeegee, "chopped" and "hand lay-up" method.

PLURAL COMPONENT SPRAY Suitable – CORCHEM® 283 does not require plural component spray. If selected, DO NOT THIN.

5:1 feed pumps with regulators and pressure gages, A&B agitators, A&B 30 mesh low pressure WYE filters between tanks and XP pump lowers, A&B ¾" fluid lines from the feed pumps to the proportioning pumps and ½" air lines for the feed pumps and agitators. *NOTE*: If using inline pump filters, use 30 mesh screens. The pump mix ratio needs to be 1:1 (1 Component A : 1 Component B). Heated hose bundle (200' maximum) with ⅜" ID paint line for the (Component B), ½" paint line for the (Component A), and hose heat controller unit with temperature sensor. Use a mix manifold with split nosed mixing manifold block. The static mixers and paint line forward of the remote mix manifold should be set as follows, (NOTE: Do not use plastic static mixers.):

Material should be preconditioned to 80°-90° F prior to use. NOTE: In the heated hoppers, the "A" side should be at a minimum of 110° F and the "B" side at 90-100° F. Failure to heat the material prior to proportioning may cause air ingestion and/or cavitation of the pumps resulting in the application of off-ratio material.

- Set "A" inline heater to 120° F and set "B" inline heater to 100° F.
- Material temperature must be 120°-130° F before being sprayed.
- Hose heat should be set at 120°-130° F.
- Material temperature at the gun should be 110°-120° F.
- Dynamic pressure (while spraying) 2,200-2,500 psi.
- The size of airless spray tip will depend on the area being sprayed, the viscosity, and the temperature of the materials. Use a Graco XHD RAC tip sized between 0.019"-0.025".
- Mixed spray life is 10 to 15 minutes at 21°C (70°F)
- Static mixers, whip lines and gun should be flushed clean within 1-2 minutes after releasing gun trigger with MEK or CORCHEM 4 thinner. Failure to flush material after 1-2 minutes can result in build-up or clogging of the static mixer, whip line and spray gun.

AIRLESS SPRAY (hot-pot) Recommended – Graco or equal. Pump ratio 68:1 or higher, 206-718 gun with fluid tip of .019" or larger orifice size with Reverse-A-Clean tip, 3/8" I.D. or larger high-pressure solvent resistant fluid line, 1/2" I.D. or larger air supply line. Continuous air source capable of 80 to 100 psi inbound pressure at pump.

CONVENTIONAL AIR SPRAY (pressure-pot) Suitable – Binks or equal. Pressure pot with mechanical agitator, dual regulators, air-gages, and oil and moisture separators. No. 2001 gun (external mix), 68SS fluid nozzle, 568 fluid needle, 68 PB air cap, heavy-duty fluid spring, Teflon fluid packing, 3/8" I.D. or larger high solvent resistant fluid line and 3/8" I.D. or larger air-supply line. Continuous air source capable of 20 cfm or more at 80 psi per nozzle and 60 psi to the pot.

Regulate pressure as required for proper application. Proportionally adjust pressure higher for smaller hose diameter and/or longer hose length and adjust pressure lower for larger hose diameter and/or shorter hose length. Select tip angles and orifice diameters according to application needs.

BRUSH Suitable – Short hair or natural bristle. May be used for touch-up of small areas or for stripe coating of welds and edges.

ROLLER Suitable – Short nap synthetic covers for back rolling. Ribbed metal roller for hand lay-up application.

SQUEEGEE Suitable – Use professional application squeegee with 1/16” notch.

APPLY In an even wet coat. Ensure seams and irregularities are completely covered. Application below minimum or above maximum suggested dry film thickness ranges may adversely affect performance. Use of a thin or "mist" coat prior to regular application may be needed to reduce pinholing and/or blistering over a rough/porous type primer or substrate.

HAND LAY-UP METHOD Use two or more layers of polyester felt or glass mat or other suitable fiber reinforcement. Adjoining layers must overlap by at least 3 inches. Apply a heavy coat of CORCHEM® 283 ENVIRONMENTAL FINISH at a rate of 30 square feet per gallon by roller or spray. Lay sections of fiber reinforcement into wet coating and work in thoroughly with ribbed metal roller to fully wet the fiber reinforcement and remove air bubbles. Minimum film thickness should be 50 mils (.050). Apply a topcoat by spray or roller to a minimum film thickness of 10 mils (.010). Total minimum dry film thickness for the complete laminate system is 60 mils (.060). Ensure all seams and irregularities are completely covered.

VENTILATION Proper ventilation during the curative process is vital for proper curing and the evacuation of solvent vapors. Warm dry air should be circulated across the entire coated surface throughout the curative process. Solvent fumes are heavier than air and should be exhausted through lower openings while fresh dry air is supplied through upper sections.

CLEAN UP Suitable – CORCHEM® 4 THINNER is a special formulated blend of chemical solvents designed for thinning and / or clean-up of certain designated CORCHEM® products.

Not suitable – Methyl Ethyl Ketone (MEK) is NOT recommended as a sole cleanup solvent. MEK alone is not sufficient to adequately clean equipment of all ingredients / components of this material.

CURING TIME This curing schedule is predicated upon application conditions where the mixed product, substrate, and ambient air temperatures are the same:

Temperature	50°F	70°F	90°F
Minimum Recoat Time	4 Hours	2 Hours	1 Hours
Maximum Recoat Time	48 Hours	24 Hours	18 Hours
Immersion – Final Cure	48 Hours	24 Hours	18 Hours

Curing times are significantly shorter for higher temperatures or lower thickness and are longer for lower temperatures or higher thickness. Curing times are affected by the method of application; thickness of applied film; the quantity of thinner (if used); the amount of ventilation and air circulation; relative humidity; etc. (refer to RECOAT AND REPAIR Section if coating reaches complete cure and hardness or if subjected to extended exposure to sunlight).

NOTE Elevated temperature / heat curing will increase drying speed and improve resistance properties. Contact CORCHEM® for instructions and heat cure times.

RECOAT AND REPAIR

If material has reached complete cure, exceeded the appropriate recoat time, or if subjected to extended exposure to sunlight, uniformly abrade the surface and feather the edges. The surface must be roughened sufficiently to provide a profile adequate to ensure a mechanical bond before recoating or topcoating. CORCHEM® C100 UNIVERSAL REPAIR may be used for holiday repair or the repair of small areas. If guidance is desired for excess dry film thickness repair, contact CORCHEM.

EXISITING COATINGS

Surfaces must be clean, dry and free of any dirt, chalk, grease, oils, salts, and deleterious materials before application is performed. **Perform a test patch to check adhesion and compatibility.** If necessary, abrade the surface sufficiently to provide a profile adequate to ensure a mechanical bond. The use of CORCHEM® 11 ADHESION PROMOTER may be desired.

POST-COATING INSPECTION

Verify desired dry film thickness; refer to ASTM D7091-13 / SSPC-PA 2 "**Procedure for Determining Conformance to Dry Coating Thickness Requirements"**.

Inspect for discontinuities, pinholes, holidays, bare areas, etc. before placing in operating service. Refer to NACE SP0188 / ASTM G62-07 "Standard Test Methods for Holiday Detection in Pipeline Coatings".

For Dry Film Thickness of 20 mils or less refer to applicable Sections for "Low Voltage" or "Wet Sponge" testing.

For Dry Film Thickness greater than 20 mils refer to applicable Sections for "High Voltage" or "Spark" testing. **Use test voltage of 100v per mil.**

Adhesion testing: if specified, refer to ASTM D4541-*LATEST, Test Method E, Protocol 2 (pass/fail test)* for non-destructive testing. Pull to maximum load ≥ 1,000 psi.

PPE / CLOTHING

Refer to the Safety Data Sheet (SDS) for complete safety information. Wear protective garments, shoes, goggles, and filter masks. Use protective barrier creams on exposed skin areas.

CONFINED SPACES

Refer to the Safety Data Sheet (SDS) for complete safety information. If thinner is added to this product use explosion-proof lighting and electrical equipment, non-sparking tools, clothes and shoes. Ground all structures and equipment. Use procedures that prevent static electrical sparks. Wear properly fitted appropriate NIOSH/MSHA approved fresh air respirator such as MSA or equal with 1/4" I.D. or larger air supply line connected directly to proper air source during and after application unless air monitoring demonstrates vapor/mist levels are within safe limits. Use suction type exhaust fans and blowers with sufficient cfm capacity to keep solvent vapors below 20% of the explosive limit. CAUTION! Air circulation and exhausting of solvent vapors must be continued until the coating has fully cured to insure that no potential for fire, explosion or health hazard remains.

MAINTENANCE / CLEANING

Address thermal shock issues related to the normal operational condition of the vessel while "in service". Care should be taken to "normalize" the vessel and its contents and avoid sudden or dramatic changes in temperature during operation. It is also desirable to consider these issues during cleaning operations, taking care to avoid inadvertently shocking the lining system by the application of pressurized hot water or steam directly against cold coated steel.

When cleaning any coated surface that is significantly colder than the cleaning method used, there is a potential risk of damage to the coating. The condition to avoid is suddenly raising the temperature of the coated surface in a specific area in a dramatic fashion.

SAFETY INFORMATION

THIS PRODUCT CONTAINS EPOXY RESINS AND AMINE COMPOUNDS. DO NOT USE IF YOU HAVE HAD A REACTION TO THESE MATERIALS. WARNING! VAPOR HARMFUL! CAUSES SEVERE EYE AND SKIN BURNS. MAY CAUSE SKIN SENSITIZATION OR OTHER ALLERGIC RESPONSES. HARMFUL OR FATAL IF SWALLOWED!

Use only with adequate ventilation. Prevent breathing of vapor or spray mists. Wear a properly fitted appropriate respirator during application and until all vapors and spray mists are gone. Prevent contact with eyes and skin. Do not take internally. Keep closures tight and upright to prevent leakage. Keep container closed when not in use. In case of spillage, absorb and dispose of in accordance with local applicable regulations. **FIRST AID:** In case of skin contact, wash thoroughly with soap and water; for eyes, flush immediately with plenty of water for 15 minutes and call a physician. Remove and wash contaminated clothing before reuse. (Discard contaminated shoes). If inhaled, remove to fresh air. If breathing difficulty persists or occurs later, consult a physician and have label and MSDS information available. If swallowed, **CALL A PHYSICIAN IMMEDIATELY. DO NOT** INDUCE VOMITING.

IN CONFINED SPACES AND TANKS OBEY SPECIAL SAFETY AND EQUIPMENT INSTRUCTIONS!

FOR INDUSTRIAL USE BY PROFESSIONAL APPLICATORS ONLY. NOT INTENDED FOR SALE TO THE GENERAL PUBLIC. This product should not be sold or delivered to any person under 18 years of age. KEEP OUT OF THE REACH OF CHILDREN! IF, FOR ANY REASON, ADDITIONAL PRODUCT AND SAFETY INFORMATION, INSTRUCTIONS OR EXPLANATIONS ARE NEEDED, CONTACT CORCHEM® IMMEDIATELY!

LIMITED WARRANTY

WARRANTY & LIMITATION OF SELLER'S LIABILITY: CORCHEM® CORPORATION warrants only that its coatings represented herein meet the formulation standards of CORCHEM® CORPORATION.

THE ABOVE WARRANTY SHALL BE IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTIONS ON THE FACE HEREOF.

The buyer's sole and exclusive remedy against CORCHEM CORPORATION shall be for replacement of this product, in the event a defective condition of the product should be found to exist. NO OTHER REMEDY (INCLUDING, BUT NOT LIMITED TO, INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR LOST PROFITS, LOST SALES, INJURY TO PERSON OR PROPERTY, OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL LOSS) SHALL BE AVAILABLE TO THE BUYER. The sole purpose of this exclusive remedy shall be to provide buyer with replacement of the product if any defect in materials is found to exist. This exclusive remedy shall not be deemed to have failed its essential purpose so long as CORCHEM® CORPORATION is willing and able to replace the defective materials.

Technical and application information is provided for the purpose of establishing a general profile of the coating and proper coating application procedures. Test performance results were obtained in a controlled environment and CORCHEM® CORPORATION makes no claim these tests or any other tests, accurately represent all environments. As application, environmental and design factors can vary significantly, due care should be exercised in the selection and use of the coating.

PUBLISHED TECHNICAL DATA AND INSTRUCTIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.
CONTACT YOUR CORCHEM® REPRESENTATIVE FOR CURRENT TECHNICAL DATA AND INSTRUCTIONS.

CORCHEM® 283 ENVIRONMENTAL FINISH

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MADE IN TEXAS, USA