

Master Builders Technologies Corrosion Control INSTALLATION PROCEDURE

1.32I

CEILCOTE® 800 COROLINE® Lining

IMPORTANT: READ THIS FIRST

Master Builders does not warrant the performance of this product unless the instructions of this document and other related Master Builders documents are adhered to in all respects.

DESCRIPTION:

Installation information contained in this procedure is as specific as possible, but cannot cover all variations in field conditions. Supervisors experienced in installing CEILCOTE® materials may sometimes deviate slightly from published procedures. This is done to give a better installation by using the most up-to-date methods to fit field and service conditions.

EQUIPMENT:

The following list of equipment is essential for a thorough job of tank lining or floor topping.

For Cleaning:

- Safety glasses.
- Abrasive blast equipment.

For Mixing:

- Volume measure for liquid (1 qt. or 1 gal.).
- Volume measure for Hardener (cubic centimeters or ounces).
- Mixing vessel.
- 5 gallon pail if mixing with a drill.
- 5 gallon pail for mixing saturating liquid.
- 1/2" drill motor.
- Plaster whip for mixing or 5 gallon electric mixer.
- Scale for weighing powder.
- Clean 3 or 5 gallon buckets.

For Applying:

- Scissors or shears for cutting glass cloth.
- Cement finishing or plastering trowel.
- Wallpaper brush (for dry pressing glass cloth before saturating).
- Smoothing brush - good grade horsehair or nylon (6") for topcoat.
- 5 qt. Pail for smoothing liquid.
- 5 qt. Pail for cleaning solvent.
- Paint rollers and frames for saturating glass.

SURFACE PREPARATION:

Steel:

Welds must be continuous and rounded to remove sharp edges, laps, undercuts and other surface irregularities. Weld spatter must be removed. Sharp edges should be rounded to a 1/8" (3 mm) radius.

Steel must be blasted to "White Metal" as defined by **SSPC-SP5 or NACE #1** with a 3 to 4 mil profile. Prime with CEILCOTE 680 Primer at 1 to 4 mils WFT.

Refer to **Specification CPT-2** for full details of constructing steel tanks to receive CEILCOTE 800 COROLINE Series.

NEW CONCRETE

Walls:

The surface of most formed concrete contains holes from air entrapment. The best preparation is to lightly sandblast to open holes covered with cement and to roughen the surface. If lining work must be done in direct sunlight, the holes should be filled after priming using the lining primer mixed with filler (S-11 Powder). The trowel should be used as a squeegee, stroking in several directions to completely fill the holes and leave only a thin film (10 mils) on the surface. If the wall is not in sunlight, the CEILCOTE 800 COROLINE base coat will sufficiently fill the holes, and thus, filling prior to lining may not be necessary.

Floors:

New concrete floors should preferably be cured for at least 28 days, then mechanically abraded by abrasive blasting or scarification to remove laitance and surface contaminants.

The Master Builders recommended construction practice for floors is found in **Bulletin CP-17 (CPT-2)**. Complete recommendations for surface preparation are found in **Bulletin CP-14**.

OLD CONCRETE

Walls

Remove contamination and old coating by gritblasting. Prime all concrete surfaces. Old concrete walls may require filling and patching as with new concrete.

Floors

The entire surface should be prepared by abrasive blasting, blastrac, chipping, scarifying, or scabbling. Acid etch is normally not recommended. Detergent cleaning is necessary for oil, grease, etc., ...contaminated concrete. Scrub a small area with strong detergent (Johnson Was Company's "J-Shop 600"). Wash with water. For weak and/or contaminated concrete, removal of damaged surface is necessary with the use of a chipping hammer, chisel, or bush hammer.

PRODUCT PREPARATION:

Storage:

All powder materials are stable indefinitely if packages are kept closed and dry. All liquids will have a one year shelf life. Materials should be kept at an ambient temperature of 50 to 90 degrees F (10 to 32 degrees C) to maintain workability and cure time. Shelf life for material is one year minimum, if kept tightly sealed.

Batch Sizes:

The size of batch will depend somewhat upon the ambient temperature. The batch size of base coat should be sufficient to do one or two strips of glass cloth. Generally one gallon at a time is recommended.

Mixing Proportions:

CEILCOTE 800 COROLINE base coat/saturant (#12 Hardener)
By weight - 1.73:1
By volume - 1.5:1

CEILCOTE 800 COROLINE TOPCOAT (#13 Hardener)
By weight - 1.82:1
By volume - 1.5:1

Mixing Procedures:

1. Always add Hardener to liquid and mix well before adding powder.
2. More or less powder may be added as required within allowable limits. (20 to 24lbs/gal of base coat or topcoat resin)
3. Use within 15 minutes after adding hardener. Working life is approximately:
 - 90 min. @ 50°F (10°C)
 - 40 min. @ 75°F (24°C)
 - 15 min. @ 90°F (32°C)

APPLICATION:**Environmental Conditions**

For all application steps, the surface temperature, air temperature and material temperature should be between 50 and 110 degrees F (10 and 43 degrees C).

Do not apply if the relative humidity is more than 90% or the surface temperature is less than 5° above the dew point of the air in the working area.

If the tank requires heating to raise the temperature above 50 degrees F (10 degrees C), the entire tank must be insulated and heat applied inside, 8 hours prior to application. If the uninsulated tank is heated during cold weather, the walls may sweat, causing poor adhesion of the lining. The wall surface temperature should be at least 5° above the dew point.

In cold weather materials should be stored in a warm place above 70 degrees F (21 degrees C). Cold materials are difficult to apply.

CEILCOTE 800 COROLINE must not be applied in direct sunlight. Blisters will form. A surface that is heated externally by the sun should be shaded. Rapid curing on a hot surface creates undesirable stresses in the lining, also blistering.

High Humidity:

If humidity is high, watch for an oily film on the saturant after cure. This must be removed by washing with water and drying thoroughly.

Coverage Factors:**Primer:**

CEILCOTE 680 Primer:
Thinned on concrete - 175 to 200 ft²/gal (4.3 to 4.9 m²/litre)
Unthinned on steel - 275 to 325 ft²/gal (6.7 to 7.9 m²/litre)

Liquids: (include hardeners)

CEILCOTE 800 COROLINE base coat/saturant (with #12 hardener) - 30 ft²/gal (.73 m²/litre)

CEILCOTE 800 COROLINE topcoat (with #13 hardener) - 45 ft²/gal (1.1 m²/litre)

Powders:

S-1 Powder 50 ft²/50#Bag

Glass Reinforcement

- Type H: 1.10 sq. ft./sq. ft.
- T-420 Smoothing Liquid: 150 to 200 ft²/gal (3.9 to 4.9 m²/litre)
- T-410 Cleaning Solvent: 200 ft²/gal (4.9 m²/litre)

Mixing and Applying:**Primer for Concrete and Steel:**

Prime with CEILCOTE 680 PRIMER. CEILCOTE 680 PRIMER should not cure longer than 2 or 3 weeks before covering with lining; a shorter time in hot weather.

To sparktest the lining on concrete substrates, prime with CEILCOTE 680C (Conductive) PRIMER. CEILCOTE 680C PRIMER should not cure longer than 2 or 3 weeks before covering with a lining; a shorter time in hot weather.

Base coat:

The base coat is best applied with a trowel. For outlets, flanges, angles and other more intricate parts of the tank, it may be found best to use a brush. It should be approximately 40 to 60 mils thick. Base coat should be mixed as listed in previous sections.

In hot weather it is best to apply CEILCOTE 800 COROLINE base coat in areas sufficient for only one section of glass cloth. Generally one gallon at a time is recommended.

Irregular Areas:**Angle Braces, Welds, etc.:**

Cover angle braces first with base coat and cloth, lapping out at least one inch on adjacent areas. The change in elevation where a brace has been welded onto a flat surface must be filled with the base coat so that the cloth will not bridge over an empty space.

Corners:

When the base coat is applied, the corner should be rounded by filling in with base coat and finishing off with a small pointing trowel. This will assist in eliminating bridging at this point. Do not start or terminate the glass cloth in the corner.

Outlets, Flanges:

Consult Master Builders.

Rivets:

The line of rivets must be filled with base coat mix to make a rounded solid section for easier covering with glass cloth.

Pitted Steel:

Pit must be filled as a separate operation prior to lining. Use CEILCOTE 680 Primer mixed to a paste with S-11 Powder. Trowel in several directions using the trowel as a squeegee. Areas that have been filled need not be primed.

Tank Bottoms:

For small tanks it is a good idea to turn the tank over on its side to do the bottom. For large tanks, the bottom is done last. To keep the prepared floor clean while lining the walls, the blasting sand may be left inside until lining the floor as long as this doesn't present a contamination problem. If it does, you may elect to remove blasting media, blast floor, prime and cover for protection.

Cloth Cutting:

Measure the length desired, (equal to the area to be base coated). This area will vary with application rate. Pull a strand of glass to form a line for cutting.

The glass is best cut with scissors or shears, following the straight line along pulled strand of glass. After cutting, one or two strands are pulled off along the cut to discourage further unraveling. Roll the Section as tightly as possible for easier handling. Glass cloth junctions should be overlapped 1 to 4 inches.

Saturating:

This should be done before the base coat has hardened. Only in cases where the glass cloth is being applied overhead is it permissible to press the cloth into the base coat and allow to harden before saturating. Roll or brush the dry cloth until the base coat starts to come through. The CEILCOTE 800 COROLINE base coat liquid used for saturating is best applied with a roller or large brush. The top lap of cloth should be lifted so that saturating liquid can be applied to the bottom layer. The top layer is then pressed on the bottom layer and saturated. Saturation is complete when all areas of the glass cloth have lost their whiteness and have become slightly translucent. The saturating coat is mixed as described in the Mixing Proportion section of this Specification.

This mixture must be stirred thoroughly for two minutes.

Topcoat:

Prior to application of the CEILCOTE 800 COROLINE topcoat, the saturated cloth must be examined for air pockets which must be cut out and patched, and all elevations, laps, etc., ground down with a sander or grinder. Examine for "blushing" which is evidenced by an oily surface (occurs mostly in humid weather). If present, wash with water and allow to dry. If cured more than 72 hours at 70 degrees F (21 degrees C). (less at higher temperatures) rough up with coarse sand paper.

The topcoat is best applied by trowel to large areas and by brushing to more intricate areas, such as flanges, outlets and the like. The topcoat should not be applied over 1/16" thick. The topcoat is smoothed out as much as possible with a trowel and then smoothed lightly with a smoothing brush saturated in T-420 Smoothing Liquid.

Curing:

Temperature	Recoat Time	Cure Time
@ 50 degrees F (10 degrees C)	24 hrs	3 to 4 days
@ 75 degrees F (24 degrees C)	10 hrs	1 day
@ 90 degrees F (32 degrees C)	6 hrs	12 to 16 hrs

If lining is applied while ambient temperature is below 70°F (21°C). and tank must be placed in service immediately, the CEILCOTE 800 COROLINE must be heat cured. Use hot air steam heat to obtain a temperature of 120°F (49°C). for 16 hours or 160°F (71°C) for 8 hours.

Allow 7 days final cure before exposure to concentrated sulfuric. Consult Master Builders, Inc. if deviations are required.

Inspection:

After initial hardening of topcoat, test with a 15,000 volt spark tester. Pinholes must be ground down to glass cloth, then filled with topcoat mix.

Cleaning:

Tank shall be thoroughly washed before being placed in service after being lined with CEILCOTE 800 COROLINE material.

SAFETY:

CEILCOTE 800 COROLINE components contain epoxy resin, solvents and aliphatic polyamine catalyst. Observe the following health, physical, and storage precautionary measures before using products.

HEALTH PROTECTION INFORMATION:

Wear gloves, eye protection, and appropriate work clothing as required to avoid contact with components. The hardener contains polyamines which can seriously burn eyes and skin. Hardener fumes may result in skin rash, dermatitis or other allergic reactions. Ventilation is required with special consideration for enclosed or confined areas. Air movement must be designed to ensure turnover at all locations in work and adjacent areas to avoid buildup of heavy vapors. Chemical hazards with vapor concentration above Permissible Exposure Limits (PEL) requires the use of an organic vapor cartridge respirator or a self-contained breathing apparatus.

Refer to Material Safety Data Sheets (MSDS) for specific health information and first aid on each product.

PHYSICAL HAZARDS:

CEILCOTE 800 COROLINE components and solvents are combustible or flammable, refer to flash points on products. When using flammable or combustible components; heat, sparks, and flames or any source of ignition must be kept at least 50 feet from working area. Use grounded non sparking tools in work area. When applying linings to enclosed area use two men, one on the outside for safety. Continue ventilation in tanks after coating until cured to minimize concentrating solvent vapor and avoid reaching potential explosive limits. Empty containers with residues may ignite from source of ignition explosively.

STORAGE SAFETY:

Observe safe storage practices by separating resins from hardeners, by keeping solvents and hardeners in a cool area free of sources of ignition, and by observing a special CEILCOTE Warning on RED and YELLOW labeled products. The CEILCOTE RED label represents amine type chemicals, and the CEILCOTE YELLOW label represents organic peroxide type chemicals which should not be stored adjacent or mixed together because of possible violent reaction between them.

FOR INDUSTRIAL AND PROFESSIONAL USE ONLY

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