

Master Builders Technologies Corrosion Control INSTALLATION PROCEDURE

1.7I

CEILCOTE® 2000MR FLAKELINE®

Installation information contained in this procedure is as specific as possible but cannot cover all variations in field conditions. Supervisors experienced in installing CEILCOTE 2000MR FLAKELINE Series materials may deviate slightly from published procedures. This is done to give 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 typical tank lining or floor topping installation using CEILCOTE 2000MR FLAKELINE Series materials.

Surface Preparation:

- Safety glasses
- Abrasive blasting, blastac, scarify or high pressure water blasting equipment

Mixing:

- Volume measure for liquid (1 qt or 1 gal)
- Volume measure for hardener (cubic centimeters or ounces)
- Mixing vessel
- 5 gal pail if mixing with a drill
- 5 gal pail for mixing saturating liquid
- 1/2" drill motor
- Plaster whip for mixing

Applying:

- Scissors or shears for cutting glass cloth
- Cement finishing or plastering trowel
- 5 qt pail for cleaning solvent
- Medium nap paint rollers for saturating glass
- Brushes, rollers or spray equipment for applying topcoat
- Ribbed roller

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 1-4 mils WFT.

Refer to **Specification CPT-2** for full details of constructing steel tanks to receive CEILCOTE 2000MR FLAKELINE Series.

Concrete Walls:

The surface of most formed concrete contains holes from air entrapment. The best preparation is to abrasive blast to open holes covered with cement and to roughen the surface. If lining work must be done in direct sunlight, breathing concrete can create a problem. It can cause lining systems to blister or bubble when material is applied during the period of

time when the air temperature is higher than the surface temperature. After priming, the holes should be filled using the lining Primer mixed with filler (S-11 Powder or S-1 for larger voids). 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 exposed to UV or sunlight, the CEILCOTE 2000MR FLAKELINE Series base coat will sufficiently fill the holes; filling prior to lining may not be necessary if the temperature swing between air and substrate does not cause blisters or bubbles. Another option for lining application on breathing concrete is to trowel base coat late in the day when air temperature is decreasing. This usually creates a tendency for the polymer to be drawn into the concrete.

For existing concrete, remove dust, contamination and old coatings. This may best be accomplished by abrasive blasting. Prime all concrete surfaces. Old concrete walls may require filling as with new concrete.

Concrete Floors:

New concrete floors should be thoroughly cured, and then mechanically abraded by abrasive blasting or scarification to remove laitance and surface contaminants.

A plastic sheet test method should be utilized to ensure substrate is moisture free. If moisture is detected, retest until dry.

The Master Builders recommended construction practice for floors is found in **Specification CP-17**. The Master Builders recommendations for surface preparation are found in **Specification CP-14**.

PRODUCT PREPARATION:

Storage:

All items must be kept in closed containers and stored at temperatures between 60 to 80 degrees F (16 to 27 degrees C). Keep materials away from all fire hazards and out of direct sunlight.

Shelf life for material is one year minimum, if kept tightly sealed.

Batch Sizes:

The size of the 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 mat. Generally one gallon at a time is recommended.

Coverage Factors:**CEILCOTE 680 Primer (Steel):**275 to 325 ft²/gal (6.7 - 7.9 m²/litre)**CEILCOTE 680 Primer (Concrete):**175 - 200 ft²/gal (4.3 - 4.9 m²/litre)

(thinned w/up to 30 fl. oz/gal T-471)

Base coat & saturant liquid: 30 ft²/gal (.73 m²/litre)**S-1 Powder:** .5 lbs/sq.ft.**Mat Reinforcement:** 1.1 sq.ft./sq.ft.**Topcoat** 50 to 70 ft²/gal (1.2 to 1.7 m²/litre) @ 15 - 20 mils**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.

Primer:

Concrete - Mix 1 gallon of CEILCOTE 680 Primer Liquid with #9 Hardener at a 3:1 ratio by volume. Stir thoroughly. Roll, brush or spray Primer into concrete at approximately 5 mils. Airless or air spray may be used. CEILCOTE 680 Primer should not cure longer than 2 or 3 weeks before covering with lining; a shorter time in hot weather. If time period is extended, consult Master Builders, Inc.

Metal - Mix 1 gallon of CEILCOTE 680 Primer Liquid with #9 Hardener (3:1 ratio by volume). Stir thoroughly. Roll, brush or spray onto metal surfaces at approximately 1 to 4 mils wet [275 - 325 ft²/gal (6.7 to 7.9 m²/litre) @ 2 mils]. Airless or air spray may be used. CEILCOTE 680 Primer should not cure longer than 2 or 3 weeks before covering with lining; a shorter time in hot weather. If time periods are longer, consult Master Builders, Inc.

Base coat:**Mixing:**

CEILCOTE 2000MR FLAKELINE (CEILCOTE 800 COROLINE base coat/saturant to #12 Hardener)

By weight - 1.73:1

By volume - 1.48:1

The base coat is best applied with a trowel. For outlets, flanges, angles and other more intricate parts of tanks, vessels or sumps, it may be found best to use a stiff brush. It should be applied at approximately 1/16" thick 40 to 80 mils.

In hot weather, it is best to apply base coat in small areas due to limited working time. When possible shade areas or utilize natural conditions such as areas not in direct sunlight.

The outlets should be covered first before any glass mat is applied to the interior of the tank. After the glass mat has been applied on the outlet, the interior of the tank is covered up to the outlet. After the glass mat on the interior of the tank has set up, a 2" strip of mat is cut to apply around the circumference of the outlet, 1" extending along the tank wall, 1" extending into the outlet.

To produce a smooth flange face, apply the topcoat slightly ridged around center circumference of the flange. Thoroughly wax a piece of plywood and clamp it on. Be certain it is flat on the face of the flange. From inside the tank, reach into outlet and remove excess material squeezed from under the form.

Rivets:

Rivets should be smoothed with base coat mix to make a rounded solid section for easier covering with glass mat.

Pitted Steel:

Pits must be filled as a separate operation after priming and 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.

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. Keep the prepared floor protected while lining the walls, or reblast the floor prior to lining.

Irregular Areas: (Angle Braces, Welds, Etc.)

Cover angle braces first with base coat and mat lapping out at least 1" 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 the mat will not bridge over an empty space.

Corners:

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

Outlet, Flanges:

Consult Master Builders.

Mat Cutting:

Measure the length desired (equal to the area to be base coated). This area will vary with application rate.

The glass is best cut with scissors or shears. Roll up the cut piece of mat tightly for easier handling.

It is necessary to press the glass mat firmly into the base coat so no hollow areas remain. This may be done with the hands, a dry towel or brush, or best of all, with a paint roller. It is necessary to be especially careful to press the glass mat firmly into corners.

Saturating:

This should be done before the troweled base coat has hardened. Only in cases where the glass mat is being applied overhead is it permissible to press the mat into the base coat and allowed to harden before saturating. The saturating liquid is best applied with a roller or large brush. At overlaps the top layer of mat should be lifted so saturating liquid can be applied to the bottom layer. The top layer is then pressed onto the bottom layer and saturated. Saturation is com-

plete when all areas of the glass mat have lost their whiteness and become slightly translucent. A ribbed roller should then be utilized to force out any entrapped air. Finally allow to dry.

Topcoat:

Mix catalyst and CEILCOTE 2000 FLAKELINE topcoat. Apply one or more coats to achieve 15 to 25 mils. Based upon field experience, CEILCOTE 2000 FLAKELINE averages 60 ft²/gal (1.5 m²/litre) @ 15 to 25 mils total film thickness. Mix ratio is CEILCOTE 2000 FLAKELINE 4:1 by volume.

Use air spray or low pressure (4:1 or 8:1) pump. Airless spray is not recommended. When rolling or brushing, an additional coat may be required to achieve recommended film thickness (**Refer to Installation procedure #2.2I for spray information**).

Curing:

To Handle:

@ 50 degrees F (10 degrees C) 3 to 4 days
 @ 75 degrees F (24 degrees C) 24 hours
 @ 90 degrees F (32 degrees C) 12 to 16 hours

Allow 14 days final cure before placing into immersion service of concentrated sulfuric acid (max. temperature 100 degrees F (38 degrees C). 7 days final cure before placing into splash and spill service of concentrated sulfuric. Consult Master Builders, Inc. if deviations are required.

Patch and Repair:

For smaller areas, less than one sq.ft., grind affected area and reapply as per original instructions. Overlap 1/2" onto the existing material and square off with masking tape. Make sure areas for overlap are sanded or prepared. For larger areas abrasive blast and reinstall per original instructions, again overlap 1- 2" onto adjacent area.

SAFETY:

CEILCOTE 200 FLAKELINE Series Mat Reinforced Linings contain resins and styrene monomer. The hardener is an organic peroxide. Observe the following health, physical and storage precautionary measures before using products.

HEALTH PROTECTION INFORMATION:

Wear glove, eye protection and appropriate work clothing as required to avoid contact with components. Ventilation to maintain vapor concentrations below 100 ppm. Air movement must be designed to ensure turnover at all locations in work and adjacent areas to avoid build up of heavy vapors. Atomized particulate matter and styrene vapor concentration above 100 ppm requires the use of eye protection and at least an organic vapor cartridge respirator. When using CEILCOTE FLAKELINE products in

enclosed area, a self-contained or air supplied breathing apparatus is recommended.

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

PHYSICAL HAZARDS:

CEILCOTE linings, components and solvents are flammable. Heat, sparks and flames or any source of ignition must be kept at least 50 feet from working area. Use grounded nonsparking 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 styrene vapors (Explosive limit Styrene 1.1%). 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.

No. 2R, 2C, 3R and 3C Hardeners organic peroxides must be stored at temperatures below 100 degrees F (38 degrees C) to avoid decomposition and below 140 degrees F (60 degrees C) to avoid ignition from sparks or flame.

WARNING - CONTACT WITH METALS OTHER THAN STAINLESS STEEL, TEMPERATURES ABOVE 140 DEGREES F (60 DEGREES C) OR CONTAMINATION OF THE HARDENER BY ANY OTHER MATERIAL CAN CAUSE VIOLENT HARDENER REACTIONS.

GENERAL:

Fumes from the application of CEILCOTE FLAKELINE materials may impart taste or odor to foods or other materials. Consult Master Builders Inc. for procedures on handling CEILCOTE products in areas containing foods.

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