

## INSTALLATION PROCEDURE

### Ceilcote® 6650 Ceilcrete

#### Reinforced Trowel Applied Novolac Ester Lining/Topping

##### Description

Installation information contained in this procedure is as specific as possible but cannot cover all variations in field conditions. If anticipated conditions do not permit following these guidelines, do not hesitate to call your CEILCOTE Representative.

##### Materials Required

The materials used for application and installation consist of :

- a. Primer – CEILCOTE 380 Primer  
380 Primer Resin and #2 Hardener
- b. Optional Primer (for high temperature)  
– CEILCOTE 370HT Primer  
370HT Primer Resin and #2 Hardener
- c. Basecoat – CEILCOTE 6650 Ceilcrete  
6650 Ceilcrete Resin and #3 Hardener
- d. Topcoat – CEILCOTE 6650 Ceilcrete  
6650 Ceilcrete Resin and #3 Hardener
- e. Smoothing Liquid – Styrene

##### Equipment

###### For Surface Preparation:

- Abrasive blasting
- Blastrac (Horizontal)
- Scarification or other mechanical means

###### For Mixing:

- Volume measure for liquid (1qt. or 1 gal.)
- Volume measure for Hardener (cubic centimeters or ounces)
- Measuring bucket (1 gal)
- 3 or 5 gal pail if mixing with drill
- 3 or 5 gal pail if mixing saturant resin
- Heavy duty ½" (1.27 cm) drill motor
- Plaster whip for mixing
- Scale (in pounds for measuring powder)

###### For Application:

- Shears or utility knife for cutting glass mat/cloth
- Plaster or cement finishing trowel (generally 4"x12")
- Marginal trowels 2" x 5" or 2" x 8"
- Wallpaper brush (for dry pressing glass mat/cloth before saturating)
- Smoothing brush – good grade horsehair, nylon, and/or short nap mohair paint roller (for topcoat)
- Paint roller covers (short 3/8" nap mohair or equivalent) and frames
- Steel or aluminum ribbed roller if using mat instead of mat/cloth
- 1 gal (3.78 liter) pail for smoothing liquid (styrene)
- 1 gal (3.78 liter) pail for cleaning solvent
- Clean Pails -3 or 5 gal (minimum 3 required for mixing, cleaning solvent and for styrene)
- Surface thermometer for environmental monitoring
- Psychrometer for determining air temperature, relative humidity, and dew point.
- Surface comparator for steel profile

- Wet film thickness gage
- Disc sander
- Cleaning rags
- Scoop for powder

##### SURFACE PREPARATION

###### Steel

1. Grit blast the surface to "White Metal" in accordance with Steel Structures Painting Council specification SSPC SP5 or NACE No. 1, using a clean and dry blasting abrasive of such mesh size that will give a 3 mil minimum profile. SSPC 10 or NACE #2 for fumes and dry environments. For welds, please refer to NACE RP0178-2003 surface finish "Butt Weld" D minimum.

2. The air supply for each blasting nozzle should be at least 250 CFM continuous input volume at 100 psi. Separators and traps should be used to assure both a dry abrasive and dry air at the nozzle.

a) Proper blasting hoods and gloves are recommended.

3. Remove dirt, dust and abrasives by vacuuming, air blowing or careful brushing.

4. All metal surfaces must be primed with Ceilcote 380 or 370HT Primer before contamination or rust deterioration can occur. Primer may be sprayed or rolled to yield 1.0 - 4.0 wet mils. Average coverage of CEILCOTE 380 or 370HT Primer is 300 sq. ft. per gal. Catalyze with 2 ½ oz. Hardener No. 2 per gallon of primer.

###### New Concrete

New concrete must be thoroughly cured. All form oils, curing solutions and laitance must be completely removed by Blastrac or grit blasting. Concrete should be abrasive blasted to a texture similar to 40-60 grit sandpaper. Prepared surfaces must be clean, dry and firm.

Use ASTM D 4263 to determine if the concrete is dry enough to apply the primer. Test several areas. Tape an 18"x18" square of polyethylene or other clear film to the floor. Leave in place for 16 hours. If condensation appears on the underside of the film or if the concrete becomes visibly damp, it is not dry enough to place the primer. Retest until no moisture appears.

###### Existing Concrete

Previously coated or heavily contaminated surfaces should be abrasive blasted to provide a clean, dense surface. New or uncontaminated surfaces must be prepared by grit or abrasive blasting, blastrac or scarification. All concrete surfaces can be primed with CEILCOTE 680 Primer. When spark testing is required, use 680 Primer with C-1 Powder.

All oils, grease, dirt, old coatings, or chemical contaminants must be removed by surface preparation. Contaminated concrete may require multiple detergent and/or solvent cleaning, abrasive blasting, or in some instances may be unsuitable for coating. If this is determined, consult CEILCOTE.

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#### Concrete Repair

All surface irregularities (i.e., bugholes, voids), should be filled. A vinyl ester mortar can be used by mixing 1 gal. of catalyzed CEILCOTE 380 PRIMER and adding 18-22 pounds of Type S-1 powder or 2 1/2 gals (approximately 9-10 lbs.) of CEILCOTE S-11 Powder to make a thick paste. Adjust working thickness by adding more or less powder. Fill voids and allow to cure hard (4-8 hrs). Refill shrinkage cracks if necessary. Allow to cure 8 hours before coating.

#### MIXING PROPORTIONS

To ensure safe working, the safety precautions listed on the labels as well as the information provided in the MSDS Sheets must be observed. The individual components must be mixed completely and thoroughly.

- **Primer**

Mix resin and hardener thoroughly and apply the Primer to the substrate by spray or roller.

Mixing Ratio	By Volume
<b>CEILCOTE 380 Primer</b>	
380 Primer Resin	1 gal
#2 Hardener	2.5 oz
<b>CEILCOTE 6650 Ceilcrete</b>	
6650 Ceilcrete Resin	1 gal
#2 Hardener	2.5 oz
S-1 Powder	20-24 lbs/gal of resin
<b>CEILCOTE 6650AR Ceilcrete</b>	
6640 Ceilcrete Resin	1 gal
#2 Hardener	2.5 oz
S-1 Powder (basecoat)	20-24 lbs/gal of resin
S-9AR Powder (topcoat)	22-26 lbs/gal of resin
<b>CEILCOTE 6650 Ceilcrete with S-10AR</b>	
6640 Ceilcrete Resin	1 gal
#2 Hardener	2.5 oz
S-10AR Powder	22-26 lbs/gal of resin

<b>CEILCOTE 6650B Ceilcrete</b>	
6650 Ceilcrete Resin	1 gal
#2 Hardener	5 oz
B-4 Powder	13-17 lbs/gal of resin

\*Use 370HT Primer for high temperature applications. See Technical Data Sheet for Ceilcote 370HT Primer.

#### HANDLING PROPERTIES

All times are approximate

Working Time	380 Primer	6650 Ceilcrete
50°F (10°C)	60 min	90 min
70°F (21°C)	45 min	60 min
90°F (32°C)	20 min	45 min

Recoat	380 Primer	6650 Ceilcrete
50°F (10°C)	5 hrs	12-24 hrs
70°F (21°C)	2 hrs	4-8 hrs
90°F (32°C)	1 hrs	3-4 hrs

Time to Place in Service	
50°F (10°C)	48 hrs
70°F (21°C)	24 hrs
90°F (32°C)	16 hrs

#### COVERAGE

Product	ft <sup>2</sup> /gal
CEILCOTE 380 Primer (Concrete)	160-200
(Steel)	250-300
CEILCOTE 380 Primer with CEILCOTE C#1 Powder (For holiday testing)	140 to 160
STYRENE Smoothing Liquid	200
CEILCOTE 6650S Ceilcrete	14 to 16
CEILCOTE 6650B Ceilcrete	12 to 14
CEILCOTE 6650AR Ceilcrete	14 to 16
H Mat/cloth / 1 ½ oz mat	1.1 x actual sq. ft.
Cleaning Solvent (T-410 or MEK)	150-200

Product	Liquid Lbs/ ft <sup>2</sup>	Powders Lbs/ ft <sup>2</sup>			
		S-1	B-4	S-10AR	S-9AR
6650S Ceilcrete	0.50	1.0	--	--	--
6650B Ceilcrete	0.55	--	0.8	--	--
6650AR Ceilcrete (S-9AR)	0.50	0.5	--	--	0.6
6650 Ceilcrete (S-10AR)	0.5	--	--	1.2	--

#### STORAGE

Containers of Ceilcote 6650 Ceilcrete, resin and hardener, styrene, and cleaning solvent should be kept closed and in a cool place [ambient 70°F (21°C)] in summertime. In winter, keep containers between 60°F (16°C) and 70°F (21°C). Packages must be stored away from flames and direct sunlight

#### MIXING PROCEDURES

1. Using a graduated mixing bucket, scoop out one (1) gallon of CEILCOTE 6650 Ceilcrete resin & place in large bucket. Three (3) or five (5) gallon size bucket is necessary but three (3) is easier to work with. One gallon is the most you should mix at one time.
2. Pour the accurately measured two and one half (2 1/2) ounces of 2 Hardener into the center of the CEILCOTE 6650 Ceilcrete resin material.
3. Immediately mix thoroughly. Use a 1/2" electric drill with a paddle or a jiffy type mixer.
4. Remove mixer from bucket and using a long (8 in) margin trowel scrape the sides and bottom of the bucket.
5. Re-mix until color is uniform.
6. For basecoat add appropriate amount of powder and repeat items 3-5 above. More or less powder may be added as required.
7. Working time is about 60 minutes at 70°F (21°C).

#### ENVIRONMENTAL CONDITIONS

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

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- Dehumidification (DH) air conditioning and/or heating equipment may be necessary to control environmental conditions.

#### APPLICATION

##### Primer

Mix CEILCOTE 380 PRIMER liquid and catalyst, Roll (short nap roller), brush or spray primer onto concrete at approximately 2-5 wet mils. Airless or air spray may be used. Consult Ceilcote Quick Reference for Spray Equipment Chart for equipment required. CEILCOTE 380 PRIMER surface must be base coated within 4 weeks (1 week if exposed to direct sunlight), to assure proper adhesion of basecoat to primer.

For longer exposure confirm recoatability by wiping with Styrene monomer. If surface becomes "tacky" adhesion is acceptable. If not softened by Styrene, surface must be sandblasted or mechanically abraded to provide a non-glossy, abraded surface. For additional questions, consult CEILCOTE.

##### Basecoat

The basecoat is best applied to large surfaces with a trowel. For outlets, flanges, angles and other more intricate parts of the tanks, it may be best to use a brush. Basecoat should be approximately 1/16" thick and mixed as listed in the mixing proportion section of this procedure.



**Troweling Basecoat**

In hot weather, it is best to apply 6650 CEILCRETE basecoat in areas sufficient for only one section of glass mat/cloth (approximately 4' wide x 5' long).

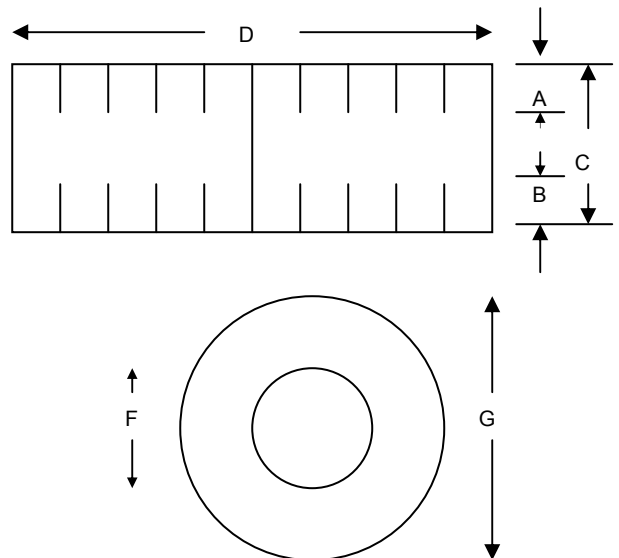
##### Irregular Areas

**Angle Braces, Welds, etc.** - Cover braces first with basecoat and mat/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 basecoat so that the mat/cloth will not bridge over an empty space.

**Corners** - When the basecoat is applied, the corner should be rounded by filling in with basecoat and finishing off with a small pointing trowel. This will assist in eliminating bridging at this point. When rolling the mat/cloth work toward the corner to avoid bridging.

**Tank Lining Outlets, Flanges** - For outlets over 2" in diameter the mat/cloth may be cut as follows:

- Slit to flange width
- 1" lap on inside tank
- Length outlet plus flange plus lap
- Circumference of outlet plus lap
- Nozzle diameter
- Flange diameter



The outlets should be covered first before any glass mat/cloth is put on the interior of the tank. After the glass mat/cloth has been put on the outlet, the interior of the tank is covered to the outlet. Then after the glass mat/cloth on the interior of the tank has set up, a 2" strip of mat/cloth 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 mounded around center circumference of the flange, Wax thoroughly a piece of plywood and clamp it on with c-clamps to the fresh topcoat, making 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** - The line of rivets must be smoothed with basecoat mix for easier covering with glass mat/cloth.

**Pitted Steel** - Pits must be filled as a separate operation after priming. Use CEILCOTE 380 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. The tank floor should be protected to keep it clean while lining the walls.

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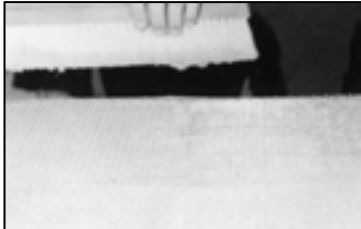
##### Mat/cloth

**Cutting and Placement** - Measure the area to be base coated. This area will vary with application rate. (Typically, 4" wide by 5' long) With the mat/cloth, remove a strand from the inside of glass section to be cut to form a line for cutting.

The glass is best cut with scissors. For mat/cloth, follow the line along the missing strand of glass. After cutting, one or two edge strands are pulled off to prevent unraveling. Roll the section(s) tightly for easier handling.

When the mat/cloth is applied, a minimum lap of 1" is required over adjacent mat/cloth.

It is necessary to press the glass mat/cloth firmly into the basecoat so that no hollow areas remain. This may be done with the hands, a dry trowel, a dry wall paper brush or a paint roller. It is necessary to be especially careful to press the glass mat/cloth firmly into corners.



**Pressing Mat/Cloth into Basecoat**

##### Saturating

The saturating coat is mixed as described in the Mixing Section of this bulletin. Saturating should be done before the troweled basecoat has hardened. Only in cases where the glass mat/cloth is being applied over head is it permissible to press the mat/cloth into the basecoat and allowed to harden before saturating.

Roll or brush the dry mat/cloth until the basecoat starts to come through. The saturating liquid is best applied with a roller or large brush. At overlap, the top lap of mat/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 the areas of the glass mat/cloth have lost their whiteness and have become slightly translucent.



**Saturating Mat/Cloth with Roller**

When chopped strand mat is used in lieu of cloth reinforcement, the fiberglass must be rib rolled immediately after saturation to remove entrapped air.



**Rolling Mat with Ribbed Roller**

##### Topcoat

The topcoat should be mixed in proportions as described in the Mixing Section of this procedure.

Prior to application of the topcoat, the saturated mat/cloth must be examined for air pockets which must be cut out and patched and all protrusions, laps, etc., ground down with a sander or grinder.

The topcoat is best applied by trowel to large areas and by brushing to more intricate areas such as flanges and outlets.



**Trowel Apply Topcoat**

The topcoat should be applied approximately 1/16" thick (60-65 mils), troweled as evenly as possible, and then smoothed lightly with a brush or short nap roller dampened with Styrene Smoothing Liquid.



**Saturating Mat/Cloth with Brush**

##### Curing

6650 CEILCRETE systems should be allowed to cure for 24-48 hours at 70°F (21°C) before being placed in service for maximum physical and chemical properties.

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#### Inspection and Testing

After initial hardening of topcoat (approximately 16 hours at 70°F (21°C)) on metal surfaces used in immersion service, test with a 15,000 volt spark tester. Pinholes must be ground down to glass mat/cloth and then filled with top coat mixture. When used on concrete, CEILCOTE 6650 CEILCRETE systems may be visually inspected for voids or spark testing may be performed. To increase the visibility of the spark a conductive primer (CEILCOTE 380 PRIMER and C-1 Powder) may be used.

#### CLEAN UP

Equipment and tools may be cleaned with T-410, MEK, or lacquer thinner before the CEILCOTE 6650 Ceilcrete has hardened. After the CEILCOTE 6650 Ceilcrete has hardened, the best way to remove it from tools is with methylene chloride.

#### SAFETY

Store in cool, dry area [50°- 90° F (10° - 32° C)] away from direct sunlight, flame or other hazards.

CEILCOTE 6650 Ceilcrete contains vinyl ester resins and MEK peroxide catalyst. The product's components have been formulated to optimize physical characteristics such as filling capacity,

abrasion, moisture and chemical resistance while minimizing hazardous physical and health factors encountered during application. A concerted effort is made to be aware of the latest chemical toxicological information and to apply this knowledge in a responsible manner to insure product safety.

During application of CEILCOTE 6650 Ceilcrete materials, always wear gloves and appropriate work mat/clothing to minimize contact. Ventilation is required with special consideration for enclosed or confined areas. Air movement must be designed to insure turnover at all locations in work area and adjacent areas to avoid buildup of heavy vapors. Use caution when handling flammable liquids, eliminate sources of ignition from work area and containers with residues.

Observe safe storage practices by separating resins from hardeners, by keeping solvents in a cool area, free of sources of ignitions.

Product Material Safety Data Sheets are available and should be consulted when handling products. These products are for industrial and professional use only; application directions must be followed.

#### MAINTENANCE

Periodically inspect the applied material and repair localized areas as needed. Consult your CEILCOTE representative for additional information.

#### Important Note

*The information in this data sheet is not intended to be exhaustive; any person using the product for any purpose other than that specifically recommended in this data sheet without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at their own risk. All advice given or statements made about the product (whether in this data sheet or otherwise) is correct to the best of our knowledge but we have no control over the quality or the condition of the substrate or the many factors affecting the use and application of the product. Therefore, unless we specifically agree in writing to do so, we do not accept any liability at all for the performance of the product or for (subject to law) any loss or damage arising out of the use of the product. WE HEREBY DISCLAIM ANY WARRANTIES OR REPRESENTATIONS, EXPRESS OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. All products supplied and technical advice given are subject to our Conditions of Sale. You should request a copy of this document and review it carefully. The information contained in this data sheet is liable to modification from time to time in the light of experience and our policy of continuous development. It is the user's responsibility to check with their local International Paint representative that this data sheet is current prior to using the product.*

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