

CEILCOTE® COROLINE® SERIES
(505, 505M, 505AR, 505U, and 510)

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

Reinforced, and non-reinforced trowel applied epoxy lining systems.

EQUIPMENT

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

For Surface Preparation

- Safety glasses
- Abrasive blast or Blastrac equipment (for horizontal surfaces)

For Mixing

- Volume measure for liquid (1qt. 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 or 5 gal. electric mixer
- Scale for weighing powder

For Applying

- Shears or knife 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
- Medium nap roller
- 5 qt. Pail for smoothing liquid
- 5 qt. Pail for cleaning solvent
- Paint rollers for saturating glass
- Surface thermometer for environmental monitoring
- Psychrometer for determining air temperatures, relative humidity and dew point

SURFACE PREPARATION

A. Steel

1. Welds must be continuous and ground 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.
2. Steel must be blasted to "White Metal" as defined by SSPC SP-5-89 or NACE Specification No. 1 with a 3 mil (minimum profile). Prime with CEILCOTE 370 Primer. Prime with CEILCOTE 680 Primer at 1 to 4 mils WFT.

Refer to Spec. CPT-2/NACE **RP-0178-91** for full details of constructing steel tanks to receive CEILCOTE COROLINE Series.

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B. New Concrete

New concrete must be thoroughly cured. All form oils, curing solutions and laitance must be completely removed. Prepared surfaces must be clean, dry and firm. Use plastic sheet test method ASTM D4263-83 to ensure concrete is moisture free. If moisture is detected, retest until dry.

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 base coat will sufficiently fill the holes. No filling prior to lining is necessary.

CAUTION: Concrete “gassing” or breathing may occur when the surface temperature is rising due to sunlight or increasing ambient temperature. This can cause bubbles or holes in the applied floor, lining or coating. When this problem occurs it is necessary to shade the surface from sunlight and/or apply the material in the cooler evening hours or at night (This usually creates a tendency for the polymer to be drawn into the concrete) so that the initial cure can take place without air escaping from the concrete. Consult Master Builders for more detailed information.

Floors

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

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

OLD 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.

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, 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 Wax 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 brush hammer.

PRODUCT PREPARATION

Storage

All materials are stable indefinitely if packages are kept closed and dry. Materials should be kept at an ambient temperature of 50°F (10°C) to 90°F (32°C) to maintain workability and cure time.

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.

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Mixing Proportions:

Product	<u>Base Coat</u>	<u>Saturant</u>	<u>Topcoat</u>
<u>CEILCOTE 505 COROLINE* Liquid</u>	1 gal.	1 gal.	1 gal.
Hardener 4A	16 fl.oz.	16 fl.oz.	16 fl. oz.
S#1 Powder (lbs)	22 to 26	---	22 to 26
<u>CEILCOTE 550 COROLINE* Liquid</u>	3 qts.	3 qts.	3 qts.
Hardener #9	1 qt.	1 qt.	1 qt.
S#1 Powder (lbs)	22 to 26	---	22 to 26
T-420 Solvent	---	1/2 pt.	---
<u>CEILCOTE 505M COROLINE* Liquid</u>	1 gal.	1 gal.	1 gal.
Hardener 4A	18 fl. oz.	18 fl. oz.	18 fl. oz.
S#1 Powder (lbs)	20 to 24	---	20 to 24
T-420 Solvent	---	1 qt.	---
<u>CEILCOTE 505AR COROLINE* Liquid</u>	1 gal.	1 gal.	1 gal.
Hardener 4A	16 fl.oz.	16 fl.oz.	16 fl.oz.
S#9 AR Powder (lbs)	22 to 26	---	---
S#1 Powder (lbs)	---	---	30 to 34
<u>CEILCOTE 505U* COROLINE Liquid</u>	1 gal.	1 gal.	1 gal.
Hardener 4A	16 fl.oz.	16 fl.oz.	16 fl. oz.
S#1 Powder (lbs)	22 to 26	---	22 to 26
<u>CEILCOTE 505M COROLINE Resin</u>	1 gal.	1 gal.	1 gal.
Hardener 4A	18 fl.oz.	18 fl.oz.	18 fl.oz.
S#1 Powder (lbs)	20 to 24	---	20 to 24
<u>CEILCOTE 510 COROLINE*</u>	1 gal.	1 gal.	1 gal.
Hardener 4A	16 fl.oz.	16 fl.oz.	16 fl.oz.
B#4 Powder	14	---	14
<u>CEILCOTE 505 Topcoat Liquid</u>	---	---	1/2 gal.

* Use CEILCOTE 505 COROLINE Resin

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.
3. Use within 15 to 30 minutes after adding hardener. Working time is approximately 70 minutes at 70°F (21°C).

ENVIRONMENTAL CONDITIONS

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

Hot Weather

CEILCOTE COROLINE Series must not be applied in direct sunlight. Blisters will form. A surface that is heated externally by the sun should be shaded.

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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

CEILCOTE 680 Primer

Concrete - 150 to 200 ft²/gal. (3.7 to 4.9 m²/litre)

Steel - 275 to 325 ft²/gal. (6.7 to 7.9 m²/litre)

CEILCOTE 680C Primer

Concrete - 125 to 175 ft²/gal. (3.1 to 4.3 m²/litre)

Use when sparktesting is desired.

CEILCOTE 505 COROLINE Lining

18 to 20 ft²/gal. (.44 to .5 m²/litre)

CEILCOTE 505M COROLINE Lining

18 to 20 ft²/gal. (.44 to .5 m²/litre)

CEILCOTE 505AR COROLINE Lining

18 to 20 ft²/gal. (.44 to .5 m²/litre)

CEILCOTE 510 COROLINE Lining

13 to 15 ft²/gal. (.32 to .4 m²/litre)

CEILCOTE 505U COROLINE Base Coat

20 to 22 ft²/gal. (.5 to .54 m²/litre)

(OPTIONAL) Epoxy Topcoat

See individual data sheet.

Powders

(sq. ft. per bag)

S#1

B-4

S-9AR

CEILCOTE 505 COROLINE 50 (4.6 m²/bag)

CEILCOTE 505U COROLINE 50 (4.6 m²/bag)

CEILCOTE 505AR COROLINE 100 (9.2 m²/bag)
(Base coat only)

83 (7.7 m²/bag)

CEILCOTE 505M COROLINE 62 (5.7 m²/bag)

CEILCOTE 510 COROLINE

83 (7.7 m²/bag)

Glass Reinforcement

Type H, O, E - 1.1 ft² per ft²

T-420 Smoothing Liquid - 150 ft²/gal. (3.7 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. Please note that a shorter cure time occurs in hot weather.

To sparktest on concrete surfaces, prime with CEILCOTE 680C (Conductive) Primer. CEILCOTE 680C Primer should not cure longer than 2 or 3 weeks before covering with a lining. Please note that a shorter cure time occurs 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. The base coat should be mixed as listed in previous sections.

In hot weather it is best to apply CEILCOTE COROLINE Series base coat in areas sufficient for only one section of glass cloth.

NOTE: There is no cloth or troweled topcoat in the CEILCOTE 505U system. An optional topcoat 8 to 10 mils DFT of CEILCOTE 600 FLAKELINE material may be applied over the base coat.

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. For easier installation use one layer of 1-1/2 oz mat in lieu of H cloth.

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.

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.

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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 straight line for cutting.

The glass is best cut with scissors, 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". Never attempt to saturate more than one layer of mat at a time.

When terminating the base coat/mat/saturate procedure at the end of the day, the base coat should extend 2" to 3" beyond the mat. Upon continuing (usually the next day) the base coat is troweled up to and over the 2" to 3" extension. The mat is layered over the extension and 1" to 4" onto the previously laid mat and saturated. Do not put base coat between overlapped areas.

Saturating (CEILCOTE 505, 505AR, 505M and 510 COROLINE)

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 saturating liquid 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 are no longer white and have become translucent in appearance. The saturating coat is mixed as described in the Mixing Proportion section of this Specification.

This mixture must be stirred thoroughly for two minutes. Alternately CEILCOTE COROLINE 505 liquid can be used to saturate for CEILCOTE COROLINE 505M material.

Topcoat (CEILCOTE 505, 505AR, 505M and 510 COROLINE)

Prior to application of the 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°F (21°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. With care, CEILCOTE 505M COROLINE material may be given a polished surface.

The formula for the topcoat is practically the same as that for the base coat except that it may be desirable to add more powder. (CEILCOTE 505AR COROLINE material uses S-9AR powder in topcoat and CEILCOTE 510 COROLINE material uses B-4 powder in base coat and topcoat).

Curing

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

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 COROLINE Systems.

SAFETY

CEILCOTE 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 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 Master Builders Warning on RED and YELLOW labeled products. The RED label represents amine type chemicals, and the 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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