

CEILCOTE® 100 FLAKELINE® Lining Series

Flake reinforced troweled applied linings

DESCRIPTION:

CEILCOTE® 100 FLAKELINE® Series of Linings are heavy duty, chemical resistant linings for protection of steel against aggressive chemicals in immersion service. The products in this series are formulated with chemical resistant polyester, vinyl ester and novolac based vinyl ester resins reinforced with glass flakes. They are trowel-applied in only two coats to achieve a film thickness of 60 to 150 mils.

This lining series provides a permeability as low as .00011 perm inches (CEILCOTE 180 FLAKELINE). CEILCOTE 100 FLAKELINE Series linings can effectively resist many concentrated chemicals and immersion temperatures as high as 210°F (97°C), offer good resistance to wet slurry or dry particle abrasion, and are resistant to chemical fume conditions at temperatures up to 250°F (121°C).

CEILCOTE 100 FLAKELINE Series Linings are available in several resin formulations to withstand concentrated acids, solvents or unique chemical mixtures and can usually be placed in service after 24 hours cure. CEILCOTE 100 FLAKELINE Series linings are to be applied only on steel.

TYPES:

CEILCOTE 103 FLAKELINE is a bisphenol polyester lining which provides protection against a wide range of acids, solvents and mild alkali solutions. It resists most weak inorganic acids, some strong acids, such as sulfuric and phosphoric, up to 70% solutions and most salts. It is also resistant to many organic solvents and to some alkali solutions, up to 10%. A food grade is available also.

CEILCOTE 140 FLAKELINE is a vinyl ester lining that has excellent resistance to organic and inorganic acid solutions. Good resistance to aliphatic solvents. Provides resistance to some alkalies.

CEILCOTE 180 FLAKELINE is a novolac based vinyl ester lining that has acid and alkali resistance equivalent to CEILCOTE 103 FLAKELINE. It is outstanding in its resistance to organic chemicals and solvents.

RESIN COATS are thin, non-pigmented versions of CEILCOTE 100 FLAKELINE Series. They are occasionally recommended as alternate third coats to provide a smooth finish or to prevent product contamination.

TYPICAL USES:

The CEILCOTE 100 FLAKELINE Series linings have been widely used within the following industries:

- Caustic Chlorine
- Fertilizer
- Food & Beverage
- Heavy Chemical
- Marine
- Metal Finishing
- Metal Refining
- Organic Chemical
- Petrochemical
- Power Industry
- Pharmaceutical
- Pulp & Paper
- Soap & Detergent
- Steel
- Textile
- Transportation

ADVANTAGES:

- Excellent chemical resistance.
- Superior permeation resistance.
- Reinforced with laminar flakes.
- High temperature capability.

COLORS:

Off White - Base coat tinted green by the addition of FG-1 Dye.

PHYSICAL PROPERTIES:

Composition

Catalyzed polyester and vinyl ester resins reinforced with inert, laminar flake particles.

Solids Content

100% Reactive

Volatile Organic Compounds (VOC)

Lab 23 method of Reg. 8-4-111 of California code
10 to 30 grams/liter

Viscosity

Trowel Consistency

Flexural Strength

ASTM D790-90 9,000 psi (62 MPa)

Linear Coefficient of Expansion

ASTM D696-90 12 to 16 x 10⁻⁶ /°F (7 to 9 x 10⁻⁶ /°C)

Tensile Strength

ASTM C 307-83 3,000 to 4000 psi (20 to 28 MPa)

Water/Vapor Transmission

ASTM E96-90 Proc. E

- 0.00022 perm in. CEILCOTE 103 FLAKELINE
- 0.00011 perm in. CEILCOTE 180 FLAKELINE

Thermal Conductivity

1 to 2 BTU in/hr, ft², °F (0.15 - .3 W/m, °K)

Service Temperature Limits

Dry (Continuous)	250°F	(121°C)
Dry (Intermittent)	250°F	(121°C)
Wet (Continuous)	200°F	(93°C)
Wet (Intermittent)	210°F	(99°C)
With Resin Coat	160°F	(71°C)
Weight/Gallon (3.8 liters):	10.0 lbs.	(4.5 kg)

Flash Point (PENSKEY-MARTENS CLOSED CUP)

CEILCOTE 103 FLAKELINE	94°F	(34°C)
CEILCOTE 140 FLAKELINE	85°F - 90°F	(29°C - 32°C)
CEILCOTE 180 FLAKELINE	82°F	(28°C)
#3R Hardener	210°F	(99°C)
2R Hardener	175°F	(79°C)

COVERAGE:

CEILCOTE 370 PRIMER

280 to 300 ft²/gal (6.8 to 7.3 cm²/liter)

CEILCOTE 100 FLAKELINE Series

12 to 14 ft²/gal (0.29 to .34 m²/liter)

Resin topcoats: 200 to 250 ft²/gal (4.9 to 6.1 m²/liter)

PACKAGING & MIX RATIO:

- CEILCOTE 370 primer (for steel):
(2 oz #3C hardener/gal resin) 1 & 5 gal
- CEILCOTE 103 FLAKELINE:
(2 oz. #3R hardener/gal resin) 1 & 5 gal.
- CEILCOTE 103 FDA FLAKELINE:
(2 oz. #3R hardener/gal resin) 5 gal
- CEILCOTE 103 FDA RTC FLAKELINE:
(2 oz #3C hardener/gal resin) 5 gal.
- CEILCOTE 140 FLAKELINE:
(2-1/2 oz #2R hardener/gal resin) 1 & 5 gal.
- CEILCOTE 180 FLAKELINE:
(2-1/2 oz #2R hardener/gal resin) 3/4 & 4 gal.
- CEILCOTE 180 RTC FLAKELINE:
(2-1/2 oz #2C hardener/gal resin) 4 gal. unit
- FG-1 Dye Green 1 fl. oz per gallon of resin ordered:
1 quart & 1 gal
- Smoothing Liquid (Styrene):
200 ft²/gal. (4.9 m²/liter) 1 & 5 gal
- T-410 Solvent as required for cleaning equipment. MEK
or lacquer thinner may be used if desired.
1 & 5 gal

HANDLING PROPERTIES:

	50°F (10°C)	73°F (23°C)	90°F (32°C)
CEILCOTE 103,140, 180 FLAKELINE			
Working Time	100 min.	60 min.	40 min.
Minimum Recoat Time (approximate)	24 hrs	4 hrs	3 hrs
CEILCOTE 370 PRIMER			
Working Time	90 min.	45 min.	25 min.
Minimum Recoat Time (approximate)	24 hrs	4 to 8 hrs	3 to 6 hrs
CEILCOTE RTC FLAKELINE			
Working Time	40 to 50 min.	20 to 30 min.	15 to 20 min.
Final Cure:	70°F (21°C) 24 hours (Lower temperatures, 48 hours)		

Maximum Recoat Time (Approximate):

Recoat within 8 weeks for CEILCOTE 103 & 140 FLAKELINE, 2 weeks if exposed to direct sunlight. For longer exposures confirm recoatability by wiping with styrene solvent, if surface becomes tacky adhesion is acceptable. If not surface must be mechanically abraded. For CEILCOTE 180 FLAKELINE, recoat within 4 hours if exposed to sunlight and 1 week when fully shaded.

SHELF LIFE:

The shelf life of CEILCOTE 103 FLAKELINE lining and CEILCOTE 370 PRIMER is 6 months when stored at temperatures below 80°F (27°C); at temperatures above 80°F (27°C), the shelf life can be 3 months or less.

The shelf life of CEILCOTE 140 FLAKELINE is 6 months at 75°F (24°C) and for CEILCOTE 180 FLAKELINE is 2 months at 75°F (24°C)

LIMITATIONS:

CEILCOTE 100 FLAKELINE Series linings, primers, hardeners, smoothing liquid and solvent must be kept in closed containers and should be stored at temperatures between 60°F and 80°F. (16°C and 27°C). Keep materials away from all fire hazards and out of direct sunlight.

INSTALLATION PROCEDURES: (abbreviated)

CEILCOTE 100 FLAKELINE Series linings should ONLY be installed in accordance with Installation Procedures Bulletin 1.4I, which contains specific application, testing and repair procedures for CEILCOTE 100 FLAKELINE Series linings.

Surface Preparation:

Steel surfaces are to be abrasive blasted with sharp, angular abrasive to "White Metal" in accordance with Steel Structures and Painting Council (SSPC) Specification SP-5-89 or NACE Specification #1 with a 3 mil minimum profile.

Priming:

Prime steel surfaces with 1.0 to 4.0 wet mils of CEILCOTE 370 PRIMER at a coverage rate of 280 to 300 ft²/gal (6.8 to 7.3 m²/liter). Three (3) wet mils will yield approximately 2.0 dry mils.

Application:

CEILCOTE 100 FLAKELINE Series materials are applied in two coats using a trowel. The base coat is tinted with the green FG-1 dye [2 oz/gallon (59 ml/liter)] and applied over the primed surface at 30 to 75 mils (a target wet film of 40 mils). When a 10 to 20 ft² (1 to 2 m²) area is covered, smooth the surface with a roller dampened with Styrene Smoothing Liquid. Repeat until entire coat is applied.

The topcoat is applied in the same manner but without the dye. Total thickness of the cured films should be 60 to 150 mils with a target dry film thickness of 80 mils.

If a resin coat is required, it is applied in a single coat. Spray application is recommended for large areas; brush or roller for smaller areas, to achieve approximately 5 to 10 dry mils.

All systems should be sparktested (holiday tested) for leaks prior to Resin Coat application or service start-up. Testing should be at least 100 volts/mil or a minimum of 10,000 volts.

CLEAN UP:

Use MEK, lacquer thinners or Solvent T-410 or T-430 for cleaning tools and equipment. **DO NOT USE ACETONE.**

SAFETY:

CEILCOTE 100 FLAKELINE Series linings contain polyester or vinyl ester resins and styrene monomer and are FLAMMABLE LIQUIDS. Heat, sparks, flame, welding or other flame hazards must not be permitted in working areas. Use grounded, non-sparking tools, equipment and shoes in enclosed areas where high vapor concentrations could occur and cause explosive hazards. Provide sufficient ventilation in tanks or enclosed areas to provide an air change each six minutes and keep vapor concentrations below 50 ppm.

If concentrations exceed 50 ppm, use absorptive respirators or fresh air masks. Use two men on enclosed jobs; one man outside for safety. If affected by inhalation, move to fresh air. Continue ventilation until product is cured, usually four hours at 70°F (21°C). For open areas, use an absorptive respirator if fumes become objectionable (explosive limits of styrene are 1.1% or 11,000 ppm).

Wear eye protection and rubber gloves when mixing material or handling hardener. Eye contact results in irritation and may cause injury to corneas. Flush eyes immediately with water for 15 minutes (seconds count) and CONSULT A PHYSICIAN IMMEDIATELY. Prolonged skin contact will cause mild irritation and may result in superficial burns. Wash skin with soap and water. Contaminated clothing should be removed and washed before reuse. Do not take internally. If swallowed, DO NOT INDUCE VOMITING. CALL A PHYSICIAN IMMEDIATELY.

No. 2C, 2R, 3C and 3R Hardeners are Organic Peroxide materials. Peroxides must be retained in their original plastic bottles until used. Store at temperatures below 100°F (38°C) to avoid decomposition. Refer to the safety instructions on the Hardener labels before using.

WARNING: Contact with metals other than stainless steel, temperatures above 140°F (60°C) or contamination of the Hardener by any other material can cause violent Hardener reactions. Use caution when handling to ensure that Hardeners contact only the original plastic container or stainless steel until mixing with the CEILCOTE FLAKELINE liquid.

Master Builders No. 2C, 2R, 3C and 3R Hardeners have YELLOW warning labels and must never be combined with Master Builders Hardeners using RED warning labels. They will react violently if mixed or spilled together. Do not store or ship packages with YELLOW warning labels with packages containing RED warning labels. NOTE: Department of Transportation diamond shipping labels are not color coded as per the above warning.

Fumes from the application of CEILCOTE 100 FLAKELINE Series Linings may impart taste or odor to foods or other materials. Consult Master Builders for procedures on handling CEILCOTE 100 FLAKELINE Series linings in areas containing foods.

Use CEILCOTE FLAKELINE materials only in accordance with the manufacturer's instructions. For industrial use and professional application only. For additional information regarding personnel protective equipment, first aid and emergency procedures, refer to the product Material Safety Data Sheets (MSDS).

For additional information, contact your local Master Builders Representative.

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