L&M Construction Chemicals, Inc.

TEC-DATA

EMERYTOP 400™

Flowable High Wear, Abrasion Resistant Floor Topping

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PRODUCT DESCRIPTION

EMERYTOP 400 is the most abrasion, impact, and chemical resistant high strength floor topping available. The product is designed for and used on waste transfer station tipping floors and other industrial floors to protect from high abrasive wear conditions. The EMERYTOP 400 floor may be returned to extreme wear service within 48 hours of placement at 70ºF.

The improved engineering properties of EMERYTOP 400 are due to two major chemical engineering breakthroughs:

1. Development of a unique blend of aggregates which combine superior toughness for greater abrasion and wear resistance and ductility for superior impact tolerance for long floor life.

2. A mixture of varied cements that produce a rapid, high, early strength concrete that is chemically resistant to organic acids and other aggressive contaminants with a good slump and ample set time for easy placement and finishing.

EMERYTOP 400 outperforms 6,000 psi concrete, mineral aggregate, and iron toppings. EMERYTOP 400 resists moisture deterioration and is harder and more abrasion resistant than other aggregate toppings. It's unique formulation provides a substantial savings in material cost when compared to iron toppings. In addition to superior performance, EMERYTOP 400 flowable formulation can be placed and finished like concrete. These superior physical properties make EMERYTOP 400 an excellent choice for heavy duty industrial service Class 6 and 7 floors, as described by ACI in it's Manual of Concrete standard, ACI 302.1R.

Basic Use:

Use EMERYTOP 400 in key areas subject to high abrasive wear conditions, impact load abrasion, and continuous wear areas such as resource recovery plants, water transfer station tipping floors, roll off areas, foundries, loading docks and industrial floors. Use it for floors requiring optimum surface density to resist penetration and the deletorious effects of industrial chemicals.

FEATURES & BENEFITS

- Fast strength gain allows a return to service in 48 hours
- Some 12 times longer floor life than 6,000 psi concrete
- Improved impact resistance due to lower modulous of elasticity
- High density for greater protection from contaminant attack
- Protects from single point impact
- Protects from chemical attack of organic acids and other contaminants
- Use in any environment
- High slump and flowable consistency for easy placement and finishing
- Significant cost savings over iron toppings

ESTIMATING

a. EMERYTOP 400 is available in two convenient sized bags, 55 lb. (25 kg.) or large disposable bulk bags of 3,000 lb. (1,365 kg). Containers are identified with product name and batch code. Yield of 55 lb. (25 kg.) bag is .34 cu. ft. (0.01 m^3).

Coverage Rates: Typical application depth ranges from 1 to 3 inches (25-75 mm). Topping depth of 1 inch (24 mm) thick requires approximately 14 pounds/square foot (65 kg/m^2). The minimum recommended depth at

EMERYTOP 400

which EMERTYTOP 400 may be appliced is 3/4 " (20 mm).

b.The greater the tonnage of waste per day (TWD) at a waste transfer station tipping floor, the greater the surface wear. With a 6,000 psi concrete floor at a 600 TWD facility the surface wear is up to 1 in./year. EMERTYTOP 400 at 3/4" will increase the floor life 12 times. For waste transfer stations with a volume of 2,000 TWD the 6,000 psi concrete surface wear is up to 2" /year. The EMERYTOP 400 at 1½ in. will increase the floor life up to 12 times.

TECHNICAL DATA

Physical Properties:

EMERYTOP 400 is a blend of aggregates, varied cements, and additives.

Technical Properties:

EMERTYTOP 400

Impact Resistance - ACI 544 2

7 days	No cracking
90 days	No cracking

Compressive Strength:

	psi	*(MPa)*
1 day	4,000	(27)
2 days	6,000	(41)
3 days	7,000	(48)
28 days	12,000	(82)

Abrasion Resistance: (ASTM C779 in.):

30 min.	0.0010
45 min.	0.0020
60 min.	0.0026

Rapid Chloride Permeability (ASTM C 1202 coulombs):

7 days	650 very low
28 days	220 very low

Length of Change: (ASTM C 157):

Air cure	0.046
Water Cure	0.007

Freeze/Thaw: (ASTM C 666)

300 cycles	94%

Flexural Strength (ASTM C 78 psi):

28 days	1,650
90 days	1,725

INSTALLATION

MIXING PROCEDURES FOR EMERYTOP 400

EMERTYTOP 400 should be mixed in a paddle-type mortar mixer. First place all the water into the mixer, then add product. For maximum flows mix 55 lbs. (25 kg.) of EMERYTOP 400 with 2.5-3.0 qts. (2.4-2.8 L) water. Mix a minimum of 5 minutes for high flow consistency. When a large volume of material is required, EMERYTOP 400 may be purchased in bulk bags of 3,000 lb. (1,360 kg.) and mixed in a concrete mixer truck. For maximum flow, mix 3,000 lb.(1,260 kg.) of EMERYTOP 400 with between 34 to 41 gallons (129 to 155 L) water. Place the required water into the concrete mixer truck. Suspend the bulk bag over the charging funnel of the mixer truck, and load the dry material while the mixer truck is running at full charging speed. FOR MAXIMUM SLUMP mix for a minimum of 5 minutes (minimum 65 revolutions at 10-15 revolutions per minute), then place. At the time of placement of EMERYTOP 400, the air temperature should be between 50ºF-90ºF (10ºC-32ºC). In cold weather placement, heated mixing water may be used. The maximum water temperature should not be greater than 110ºF (43ºC). In hot, dry weather installations, mixing water may be chilled using block ice. Use L&M E-CON to protect surfaces from rapid drying.

TECHNICQUES FOR PLACEMENT OVER HARDENED CONCRETE

Hardened Concrete Substrate Requirements:

The substrate concrete must be structurally sound and have a minimum compressive strength of 4,000 psi (27 MPa). When calculating load carrying capabilities of the slab, the EMERYTOP 400 thickness should be included. Cracks in the concrete substrate must be repaired before placement of the EMERYTOP 400. If they are not repaired and their causes corrected, the EMERYTOP 400 will crack in the same place and may delaminate. Refer to ACI 302.1.R for guidance on

requirements for structurally sound slabs.

Surface Preparation

Base slab surface must comply with section 4.2 of ACI 503.5R. This section is specific to the surface and temperature conditions during the application of the L&M EPOBOND, an Epoxy bonding agent. The top surface of the concrete must be scarified and should have a 1/4" (6mm) amplitude profile. Remove all laitance and contaminated areas creating a coarse profile be either multiple passes with a shot blast machine or scarifier. The surface must be clean, free of oil, laitance, standing water or any other contaminants.

Priming:

After proper surface preparation, the surface is primed with either the Epoxy or the slurry bond coat method for positive bonding of the topping to the slab.

Epoxy Bond Coat Method:

Follow application procedures described in EPOBOND literature. Should EPOBOND lose it's tackiness before placement of the EMERYTOP 400, recoat surface with EPOBOND.

Slurry Bond Coat Method:

Prepare the bonding slurry by mixing equal volumes of EVERBOND and dry portland cement to a creamy, paint-like consistency. Scrub or broom the slurry into the damp surface, no more than 30 minutes before the placement of the EMERYTOP 400. RE-PRIME areas that dry before installation of product.

Placement over Hardened Concrete:

Using a roller or pipe screed, set the strike-off level of the vibratory screed to the specified final elevation of the concrete floor. Place the EMERYTOP 400 over the EPOBOND or the wet EVERBOND slurry mix immediately ahead of the vibratory screed.

EMERYTOP 400 should be placed approximately 1/8 inch (3 mm) above the top of the screed. Strike off the product with a vibratory screed, which is essential for the initial consolidation of EMERYTOP 400. Use normal concrete finishing methods to finish the surface of the EMERYTOP 400. During power floating pass, use a mechanical troweling machine equipped with float shoes to keep topping open, allowing water evaporation and minimizing the danger of surface blisters. Power trowel to desired finish. Leave textured finish if extra non-slip performance is needed.

MONOLITHIC PLACEMENT OVER PLASTIC CONCRETE

Substrate Concrete Requirements:

The substrate concrete should be designed to develop a minimum of 4,000 psi (27 MPa) compressive strength. It must not contain calcium chlorides, stearates or other substances which are corrosive. The air content of the substrate concrete shall be 3% maximum and the slump shall not be greater than 5 inches (125 mm). During the placement of the substrate concrete and **EMERYTOP 400** un-vented fossil-fuel heaters should not be used. Un-vented fossil fuel heaters will cause carbonation of fresh concrete and **EMERYTOP 400**.

Placement and Preparation of Plastic Substrate Concrete:

Place the concrete and strike off using a vibratory screed. Bullfloat immediately after strike off and before bleed water appears. After concrete bleed water has dissipated, darby (jitterbug) surface to produce a mortar bed approximately 1/4 in. (5 mm) thick, measured from the top of the coarse aggregate. Using a tining rake, lightly score the concrete surface at right angles to a depth of approximately 1/8 in. (3 mm).

Raise the strike-off level of the vibratory screed to the specified final elevation of the concrete floor. Firmly attach the guides for the vibratory screed to the substrate and not on the plastic concrete surface. The minimum thickness of **EMERYTOP 400** is 3/4 inch (20 mm). Operate the vibratory screed at 1/4 speed.

Placement over Plastic Concrete:

This type of application requires an experienced and extremely skilled contractor and crew.

A bonding agent is <u>not required</u> when **EMERYTOP 400** is being placed on plastic concrete. Place the **EMERYTOP 400** on the surface of the concrete immediately ahead of the vibratory screed. Care should be taken not to exceed

the screed's capacity. The **EMERYTOP 400** should be approximately 1/8 in. (3 mm) above the top of the screed. Strike off the **EMERYTOP 400** with vibratory screed. Measure topping depth frequently.

If, during placement, coarse aggregate from the plastic concrete starts to appear through the surface of the topping, lower the vibratory screed running speed or delay further placement of **EMERYTOP 400** until the concrete is less plastic.

Use normal concrete finishing methods to finish the surface of the **EMERYTOP 400**. During power floating pass, use power trowel with float shoes to keep topping open, allowing proper water evaporation to minimize the danger of surface blisters. Power trowel to desired finish. Leave textured finish if extra non-slip performance is needed.

Joint Placement on Monolithic Concrete Pour:

Joints placed in **EMERYTOP 400** must pass through its full thickness and into the base concrete to the depth and spacing required by ACI 302.

Special Curing Requirements When Placed over Plastic Concrete:

After final finishing step water cure the EMERY TOP 400. The area may be opened to full service in 48 hours, continue with the water cure for 7 days if area is not opened to service during this period.

FOR BEST RESULTS:

- ACI Manual of Concrete Practices are to be followed. To avoid surface carbonation during cold weather application of **EMERYTOP 400**, do not use un-vented fossil-fuel heaters.
- The temperature of **EMERYTOP 400** should be between 50°F and 90°F (10°C and 32°C) at the time of placement.
- Do not add accelerators or other admixtures to **EMERYTOP 400**. Avoid application in extreme weather.
- A pre-placement job conference is required with this product to carefully plan the installation.
- Minimum depth is 3/4 inch. (20 mm).

PRECAUTIONS

Contains portland cement. Freshly mixed cement is highly alkaline and may cause skin injury. Avoid creating and inhaling dust. Provide ventilation and respiratory protection. Dust mask recommended.

Please refer to Product Material Safety Data Sheet (MSDS) before using.

STORAGE/SHELF LIFE

EMERYTOP 400 contains portland cement. Bags are to be kept in cool, dry storage to prevent water damage. Shelf life is a minimum of one year in factory sealed bags.

TECHNICAL SERVICES

L&M REQUIRES that the installing contractor schedule a pre-placement conference with the L&M technical representative to carefully plan each step of the installation. To the extent that job site services are provided, however, such services will be in the nature of technical recommendations only and will not include supervision or quality control of application procedures or engineering details.

WEBSITE

L&M's convenient internet website offers instant access to Tech Data Sheets, Material Safety Data Sheets, product updates, and other useful information. Visit www.lmcc.com and follow the easy steps. L&M is ready to respond to your concrete information needs - anytime - anywhere!

LIMITED WARRANTY

This product is warranted to be free of defects in material and workmanship, and conform to L&M Construction Chemicals ("L&M") quality control standards. All recommendations, statements and technical data herein are based on tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as a warranty or guaranty of any kind, expressed or implied including but not limited to, an implied warranty of merchantability or an implied warranty of fitness for a particular purpose. Satisfactory results depend upon many factors beyond L&M's control. User shall rely on his or her own information and tests to determine suitability of the product for the intended use and user assumes all risk, loss, damage, expense and liability resulting from his or her direct use, indirect use or consequential to their use of the product. L&M shall not be liable to the buyer or any third person for any injury, loss or damage directly or indirectly resulting from use or inability to use the product. L&M's sole responsibility shall be to replace that portion of the product which proves to be defective. Any warranty claim must be made within six (6) months from the date of the claimed breach. This limited warranty applies only if the product was properly installed and used according to all instructions and was properly stored prior to use.

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