L&M Construction Chemicals, Inc.

TECH DATA

EMERYTOP 400™

Flowable Emery Topping for High Wear, Extra Heavy Duty Floors

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PRODUCT DESCRIPTION

For the most abrasion resistant, heavy duty floor topping, we recommend **EMERYTOP 400.** This flowable, natural emery aggregate floor topping produces a very durable floor. **EMERYTOP 400** provides an economical, abrasion resistant solution to very severe and abusive concrete floor conditions where other solutions have failed.

EMERYTOP 400 uses polyhederal shaped isostructures of emery as its primary aggregate base. Our natural emery aggregate contains nature's highest content of aluminum oxide and ferric oxide for unsurpassed toughness. This unique aggregate has a hardness (Mohs scale rating) approaching that of industrial diamonds. **EMERYTOP 400** produces a dense, cohesive mass that is rust-free, chemically resistant and results in a thick floor surface for maximum abrasion and impact resistance. **EMERYTOP 400** floors are also resistant to the destructive attacks of mild organic acids, alkalis and oils.

EMERYTOP 400 outperforms normal concrete and high strength iron topping floors. **EMERYTOP 400** resists moisture deterioration, and is harder and more abrasion resistant than iron aggregate toppings. Its unique formulation provides a substantial savings in material cost when compared to iron toppings. In addition to superior performance, **EMERYTOP 400's** 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 its Manual of Concrete Practice standard, ACI 302.1R.

Basic Use: **EMERYTOP 400** contains natural emery aggregates which contain a minimum of 58% natural aluminum oxide. Aluminum oxide aggregate, the hardest mineral approaching diamonds, reinforces concrete floors by developing a dense, long lasting, abrasion and impact resistant floor to withstand the most severe wear conditions. Use **EMERYTOP 400** in key areas subject to heavy traffic, impact abrasion and continuous wear such as resource recovery plants, tipping floors, roll-off areas, foundries, loading docks, truck, tractor and auto installation and repair areas, mill scale sluiceways, smelters, machinery manufacturing plants and generating stations. **EMERYTOP 400's** unique non-rusting formula is ideal for outside loading docks and industrial plants using chemicals. Use **EMERYTOP 400** on floors requiring optimum surface density to resist mild industrial chemical penetration.

FEATURES & BENEFITS

- *Fast turn around for weekend shut downs.*
- *Increases concrete wear resistance up to eight times.*
- *Easy application, new flowable consistency.*
- *Significant cost savings over iron toppings.*
- *Resists severe single point impacts.*
- *High density-resists industrial contaminants.*
- *Rust-free service - inside or outside applications.*

ESTIMATING

EMERYTOP 400 is available in two convenient sized bags, 55 lb. (25 kg) or large disposable bulk bags of 3,000 lbs. (1365 kg.). Containers are identified with product name and batch code. Yield of 55 lb. (25 kg) bag is .36 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 (25 mm) thick requires approximately 14 pounds/square foot (65 kg/m^2). The minimum recommended depth at which **EMERYTOP 400** may be applied is ¾" (20 mm).

TECHNICAL DATA

Physical Properties:

Emery Aggregate	
Type, aggregate only	AL_2O_3, min. 58% Fe_2O_3, min. 24%
Hardness, Mohs 10=diamond	9

EMERYTOP 400
Impact Resistance - ACI 544 2

7 days	No Cracking
90 days	No Cracking

EMERYTOP 400

EMERYTOP 400 ***Physical Properties :***

Compressive Strength	
1 day	3,800 psi
2 day	6,550 psi
3 day	8,100 psi
7 days	9,500 psi
28 days	12,750 psi
Freeze/Thaw -ASTM C 666	
300 Cycles - 94%	
Abrasion - ASTM C 944	
Loss in Grams	0.8
Length Change %, ASTM C 157	
28 days	.07
Flexural Strength, ASTM C 78	
28 days	1650
90 days	1725
Permeability - ASTM C 1202 (AASHTO-T-277)	
Resistivity (ohm-cm)	97,000
Coulombs Passed	220 (Very Low)

INSTALLATION

MIXING PROCEDURES FOR EMERYTOP 400

EMERYTOP 400 should be mixed in a paddle-type mortar mixer. First place all the water into the mixer, then add **EMERYTOP 400**. For maximum flow, mix 55 lbs. (25 kg) of **EMERYTOP 400** with 2.5 qts. (2.4 L) water. Mix a minimum of 5 minutes for high flow consitency. When a large volume of material is required, **EMERYTOP 400** may be purchased in bulk bags of 3,000 lb. (1360 kg) and mixed in a concrete mixer truck. For maximum flow, mix 3,000 lb. (1360 kg) of **EMERYTOP 400** with between 34 to 37 gallons (129 to 140 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 of 65 revolutions at 10-15 revolutions per minute), then place. The temperature of **EMERYTOP 400** should be between 50°F and 90°F (10°C and 32°C) at the time of placement. In cold weather placement, heated mixing water may be used. The maximum water temperature should not be greater than 110°F (43°C). In hot, dry weather installations, mixing water may be chilled using block ice. Use **L&M E-CON** to protect surfaces from rapid drying.

TECHNIQUES 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:

The top surface of the concrete must be scarified and left irregular, exposing the topmost surface of the coarse aggregate with a minimum amplitude of 1/4 inch (5 mm) between peaks and valleys. Soak base concrete with water to a saturated surface dry (SSD) condition. This is best achieved by water soaking the substrate for 12 hours and, just prior to applying the bonding slurry and placing the **EMERYTOP 400**, remove all surface water, leaving only a damp surface.

Priming With Slurry Bond Coat:

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 screen to the specified final elevation of the concrete floor. Place the **EMERYTOP 400** over the wet **EVERBOND** slurry mix immediately ahead of the vibratory screed.

EMERYTOP 400 should be placed approximately 1/8 inch (3 mm) above the bottom 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.

Joint Placement over Existing, Hardened Concrete Substrate:

Joints in the base concrete and **EMERYTOP 400** must coincide. Joints placed in the **EMERYTOP 400** must pass through its full thickness and into the base concrete to the depth and spacing required by ACI 302. After curing 60 days or more, control joints may be filled with **L&M EPOFLEX SL** or **JOINT TITE**.

Curing & Special Requirements:

Water cure the EMERY TOP 400. The area may be opened to full service in 48 hours, while continuing with the water cure for 7 days.

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 bottom 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, while continuing with the water cure for 7 days.

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.

For Professional Use Only.

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