EMERYTOP 400™

DS-177.0-0615

1. PRODUCT NAME
EMERYTOP 400™

2. MANUFACTURER
LATICRETE International, Inc.
1 LATICRETE Park North
Bethany, CT 06524-3423 USA
Telephone: +1.203.393.0010, ext. 235
Toll Free: 1.800.243.4788, ext. 235
Fax: +1.203.393.1684
Website: www.lmcc.com

3. PRODUCT DESCRIPTION
EMERYTOP 400 is an abrasion resistant, heavy duty floor topping. This flowable, natural emery aggregate floor topping produces a long-lasting and resilient 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 aggregate topping floors. Its unique formulation provides a substantial savings in material cost when compared to iron toppings. In addition to superior performance, EMERYTOP 400 has a flowable formulation which 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.

Uses
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 facilities, mill scale sluiceways, smelters, machinery manufacturing plants, and generating stations. EMERYTOP 400 has a unique non-rusting formula that is ideal for outside loading docks and industrial plants using chemicals. Use EMERYTOP 400 on floors requiring optimum surface density to resist industrial chemical penetration.

Advantages
- Increases concrete wear resistance up to eight times
- Easy application and flowable consistency
- Significant cost savings over iron toppings
- Resists severe single point impacts
- High density-resists industrial contaminants
- Rust-free service - interior or exterior applications
- Fast turnaround for weekend shut downs

Suitable Substrates
- Existing Concrete
- Freshly Placed Concrete

Packaging
55 lb (25 kg) bag
3,000 lbs (1361 kg) Supersack

Approximate Coverage

Nominal Thickness	Approximate Coverage Per 55 lb. (25 kg) Bag	Approximate Coverage Per 3000 lb. (1361 kg) Bag
1" (25 mm)	4.4 ft² (0.41 m²)	240 ft² (22.3 m²)
2" (50 mm)	2.2 ft² (0.20 m²)	120 ft² (11.15 m²)
3" (75 mm)	1.4 ft² (0.13 m²)	80 ft² (7.43 m²)

Note to Estimator: *Estimate between 5 to 10% extra material for varied substrate textures and profiles and waste.*

Yield
55 lb (25 kg) bag is 0.4 ft³ (0.01 m³)
4175 lbs. = 1 Cubic Yard

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

Limitations
- 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 1" (25 mm)
- Maximum depth is 3" (75 mm). Contact LATICRETE Technical Services for information on thicker applications.

Cautions
- Consult SDS for more safety information
- Protect finished work from traffic until fully cured
- Contains portland cement and silica sand. May irritate eyes and skin. Avoid contact with eyes or prolonged contact with skin. In case of contact, flush thoroughly with water.
- Do not take internally. Silica sand may cause cancer or serious lung problems. Avoid breathing dust. Wear a respirator in dusty areas.
- Keep out of reach of children

Mock-ups and field test areas are required in order to validate performance and appearance related characteristics (including but not limited to color, inherent surface variations, wear, anti-dusting, abrasion resistance, chemical resistance, stain resistance, coefficient of friction, etc.) to ensure system performance as specified for the intended use, and to determine approval of the decorative flooring system.

4. TECHNICAL DATA

Applicable Standards and Test Methods
ASTM C109
ASTM C666
ASTM C157
ASTM C1202
ASTM C143

Physical and Working Properties

Emery Aggregate	
Aggregate Type	Min 58% Al_2O_3 Min 24% Fe_2O_3
Hardness (emery aggregate)	9 (mohs scale)
EMERYTOP 400™	
Impact Resistance (ACI 544 2)	7 days: no cracking 90 days: no cracking
Compressive Strength (ASTM C109) Note: Adding Additional Aggregate and/or water can result in lower compressive strength and other physical properties.	1 day: 5000 psi (34.5 MPa) 2 days: 7100 psi (50 MPa) 3 days: 8200 psi (56.6 MPa) 7 days:10600 psi (73.1 MPa) 28 days: 12500 psi (86.2 MPa)
Slump per ASTM C143	8"-9" (20 cm – 22.5 cm)
Abrasion ASTM C944	Depth 60 min – In.0.008 (0.2 mm)
Length Change ASTM C157	28 days: -0.0053%
Flexural Strength ASTM C78	28 days: 1650 psi (11.4 MPa) 90 days: 1725 psi (11.9 MPa)
Permeability ASTM C 1202; AASHTO-T-277	Coulombs passed: 87
Chloride Ion Penetration	Very Low

5. INSTALLATION

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" (6 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.

MIXING PROCEDURES FOR EMERYTOP 400
EMERYTOP 400 should be mixed in a paddle-type mortar mixer or Ready Mix truck for high volume placements. First place all the water into the mixer, then add EMERYTOP 400. For maximum flow, mix 55 lbs (25 kg) of EMERYTOP 400 with 2.5-3.0 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 (1361 kg) and mixed in a concrete mixer truck. For a maximum slump range of 8-9 inches (20-22.5 cm), mix 3,000 lb (1361 kg) of EMERYTOP 400 with between 34-41 gals (129-155 L) water. Place the required water into the concrete mixer truck. Suspend the bulk bag over the charging funnel of the mixer truck, and slowly load the dry material at a steady rate so that dry material mixes with water allowing for a smooth workable consistency. This will also help prevent the formation of large lumps (cannonballs) in the drum 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. At the time of placement of EMERYTOP 400, the air temperature should be between 50-90°F (10-32°C). 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. Use E-CON to protect surfaces from rapid drying.

TECHNIQUES FOR PLACEMENT OVER HARDENED CONCRETE
Hardened Concrete Substrate Requirements:
The concrete must be structurally sound and have a minimum compressive strength of 4,000 psi (27.6 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.

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.

Priming With Epoxy:
Use EPOBOND™ and mix according to instructions. Apply thin, uniform layer with brush, roller, spray or squeegee at the rate of 80-150 ft^2/gal (2-3.7 m^2/L) approximately 10-20 mils (0.25-0.5 mm) thick. Avoid forming pools or puddles. Place new concrete, grout or topping while EPOBOND is tacky. If surface to be bonded is no longer tacky, it must be reprimed.

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 wet EVERBOND™ slurry mix immediately ahead of the vibratory screed.
EMERYTOP 400 should be placed approximately 1/8" (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 JOINT TITE 750™.

Curing & Special Requirements:
Water cure the EMERYTOP 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 (27.6 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" (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. Bull float 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" (6 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" (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 1" (25 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 not required 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" (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.

6. AVAILABILITY AND COST

Availability
L&M™ and LATICRETE® materials are available worldwide.
For Distributor Information, Call:
Toll Free: 1.800.243.4788
Telephone: +1.203.393.0010
For on-line distributor information, visit LATICRETE at **www.lmcc.com**.

Cost
Contact a LATICRETE Distributor in your area.

7. WARRANTY

See 10. FILING SYSTEM:
DS 230.13: LATICRETE Product Warranty

8. MAINTENANCE

The service life of EMERYTOP 400 can be extended by establishing a cleaning routine. EMERYTOP 400 should be routinely washed to remove contaminants using a hose or low pressure spraying system. Brush the surface to clear embedded debris with a push broom. The use of sacrificial rubber bumpers on power equipment is strongly suggested to minimize wear of the EMERYTOP 400. Routinely inspect bumpers and replace when worn. Schedule annual inspections to review and repair worn or damaged areas. Clean and fill construction joints with JOINT TITE 750. Cut out and replace spalled areas with EMERYTOP 400. For general repairs such as curb knockouts use DURACRETE™.

9. TECHNICAL SERVICES

Technical Assistance

Information is available by calling the LATICRETE Technical Service Hotline:

Toll Free: 1.800.243.4788, ext. 235
Telephone: +1.203.393.0010, ext. 235
Fax: +1.203.393.1948

Technical and Safety Literature

To acquire technical and safety literature, please visit our website at **www.laticrete.com**.

10. FILING SYSTEM

Additional product information is available on our website at **www.laticrete.com**. The following is a list of related documents:

DS 230.13: LATICRETE Product Warranty
DS 172.9: E-CON™
DS 176.2: EVERBOND™
DS 176.1: EPOBOND™
DS 176.5: JOINT TITE 750
DS 174.4: DURACRETE™

L&M Construction Chemicals
A product brand of LATICRETE International, Inc.
LATICRETE International, Inc. • One LATICRETE Park North, Bethany, CT 06524-3423 USA • 1.800.243.4788 • +1.203.393.0010 • www.laticrete.com