



# L&M™ EMERYTOP 400™

DS-177-0720

**Globally Proven  
Construction Solutions**



## 1. PRODUCT NAME

L&M™ EMERYTOP 400™

## 2. MANUFACTURER

LATICRETE International, Inc.

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## 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 polyhedral 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 of 9) 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

- Protect Heavy Traffic Areas
- Resist Industrial Chemical Penetration
- Resource Recovery Plants
- Roll-Off Areas
- Foundries
- Loading Docks
- Truck & Auto Installation and Repair Facilities
- Mill Scale Sluiceways
- Smelters
- Machinery Manufacturing Plants
- Generation Stations
- Industrial Plants

### 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
- Protect from heavy impact, abrasion and continuous wear
- Resists industrial chemical penetration

### Suitable Substrates

- Concrete

### Packaging

- 55 lb (25 kg) bag
- 3000 lb (1361 KG) Supersack

## Approximate Coverage

| Nominal Thickness | Approximate Coverage Per 55 lb (25 kg) bag    | Approximate Coverage Per 3000 lb (1361 kg) bag |
|-------------------|---|--|
| 1"<br>(25 mm)     | 4.4ft <sup>2</sup><br>(0.41 m <sup>2</sup> )  | 240 ft <sup>2</sup><br>(22.3 m <sup>2</sup> )  |
| 2"<br>(50 mm)     | 2.2 ft <sup>2</sup><br>(0.20 m <sup>2</sup> ) | 120 ft <sup>2</sup><br>(11.15 m <sup>2</sup> ) |

Add 5%-10% additional material for varied substrate textures, profiles and waste.

Coverage values are approximate and will vary based on surface condition, preparation methods and application technique.

## Shelf Life

Bags are to be kept in dry storage to prevent water contamination. Shelf life is 6 months in unopened bags when properly stored.

## Limitations

- To avoid surface carbonation during cold weather application of EMERYTOP 400, do not use un-vented fossil-fuel heaters.
- Do not add accelerators, excess aggregate, excess water or other admixtures to EMERYTOP 400
- Do not install in extremely hot weather. Follow ACI 305R-99 Hot Weather Concreteing.
- Do not install in extremely cold weather. Follow ACI 306.1R-90 Standard Specification for Cold Weather Concreting
- A pre-placement job conference is required with this product to carefully plan the installation
- Minimum depth is 1" (25 mm)
- Maximum depth is 2" (50 mm). Contact LATICRETE Technical Services for information on thicker applications.
- Cracks are common and expected with concrete and concrete topping products. LATICRETE cannot predict where or to what extent cracking will occur. Cracks are not a product defect.
- "Bonding of two-course floors is a highly critical operation requiring the most meticulous attention to the procedure described. Even with such care, such bonding has not always been successful. As a result, contractors using this type of construction for heavy-duty industrial applications should be experienced and familiar with the challenges presented." Reference ACI 302.1R

## Cautions

- Consult SDS for more safety information
- Contains portland cement and silica sand. Causes skin burns and serious eye damage. Wear protective gloves/protective clothing/eye protection/face protection. In case of contact, flush thoroughly with water.

- Do not take internally. Silica sand may cause cancer, respiratory irritation or serious lung problems. Do not breathe dust. Wear a respirator in dusty areas.
- Keep out of reach of children

## 4. TECHNICAL DATA

### Physical Properties

| Property                 | Result   |
|--------------------------|--|
| Aggregate Type           | Min 58% Al <sub>2</sub> O <sub>3</sub><br>Min 24% Fe <sub>2</sub> O <sub>3</sub> |
| Emery Aggregate Hardness | 9 (Mohs Scale)   |

| Property                 | Test Method               | Result   |
|--------------------------|---------------------------|--|
| Impact Resistance        | ACI 544 2                 | 7 Days: No Cracking<br>90 Days: No Cracking  |
| Compression Strength     | ASTM C109                 | 1 Day: 5,000 psi (34.5 MPa)<br>2 Day: 7,100 psi (50 MPa)<br>3 Day: 8,200 psi (56.6 MPa)<br>7 Day: 8,500-10,000 psi (58.6-73.1 MPa)<br>28 Day: 9,000-12,000 psi (62.1-82.7 MPa) |
| Abrasion                 | ASTM C944                 | Depth 60 min - 0.008" (0.2 mm)   |
| Length Change            | ASTM C157                 | 28 Days: -0.0053%  |
| Flexural Strength        | ASTM C78                  | 28 Day: 1380 psi (9.5 MPa)   |
| Permeability             | ASTM C1202 / AASHTO T-277 | Coulombs passed: 87  |
| Chloride Ion Penetration | ---                       | Very Low   |

Adding additional aggregate, water or other additives result in lower compressive strength and other physical properties.

Specifications subject to change without notification. Results shown are typical but reflect test procedures used. Actual field performance will depend on installation methods and site conditions.

## 5. INSTALLATION

Mock-ups and field test areas are recommended 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 system.

## **HARDENED CONCRETE INSTALLATION**

### **Surface Preparation over Hardened Concrete**

The concrete must be structurally sound and have a minimum compressive strength of 4,000 psi (27.6 MPa). All damaged or cracked areas that are structurally unsound must be repaired and/or replaced with new concrete as needed leaving the specified depth (typically 1-2 inches) for the EMERYTOP 400 topping slab. Cracks in the concrete substrate must be repaired before placement of the EMERYTOP 400. If cracks are not repaired and their causes corrected, the EMERYTOP 400 may have reflective cracks and may delaminate. Refer to ACI 302.1.R for guidance on requirements for structurally sound slabs.

The surface of the existing concrete base slab must be scarified and left irregular, exposing the coarse aggregate with a minimum amplitude of 1/4" (6 mm) between peaks and valleys (ICRI CSP 8-10). Remove all loose dust and debris then soak concrete with water to a saturated surface dry (SSD) condition. This is best achieved by water soaking the substrate for 12 hours. Then just prior to applying the bonding slurry and placing the EMERYTOP 400, remove all surface water leaving only a damp surface with no puddling.

### **Priming with Bonding Slurry/Grout over Hardened Concrete**

Prepare the bonding slurry by adding equal amounts by volume, L&M EVERBOND and dry portland cement (example: 1 gallon of EVERBOND to 1 gallon of dry portland type 1 cement) into a bucket then drill mix to a creamy, thin paint like consistency. The bonding slurry should be applied to the floor in segments keeping only a short distance ahead of the placing of EMERYTOP 400 topping. Pour and scrub or broom the bonding slurry thoroughly into the prepared concrete base slab at approximately 80-100 ft<sup>2</sup>/gal. (2 - 2.4 m<sup>2</sup>/l) Do not leave puddles of bonding slurry mix on the surface. The bonding slurry must remain wet and tacky. Re-apply bonding slurry to areas that are dry and are not tacky to the touch before installation of EMERYTOP 400.

### **Mixing**

L&M EMERYTOP 400 comes prepackaged in 55 lb (25 kg) bags and 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 2.5-3.0 qts (2.4-2.8 L) water per 55 lb (25 kg) bag of EMERYTOP 400. Mix a minimum of 5 minutes to achieve a high flow consistency.

When a larger volume of material is required, use a Ready Mix Concrete truck and prepackaged 3,000 lb (1361 kg) supersacks. Mix each 3,000 lb (1361 kg) supersack of EMERYTOP 400 with 35-40 gal (133-152

L) of water. A typical batch would be 4 supersacks of EMERYTOP 400 added to 140-160 gal of water. Preload enough water in the truck for the entire batch. Do not guess on the amount of water. Use a water meter or other accurate method to measure. Suspend the supersack 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 help minimize the formation of large lumps (cannonballs) in the drum. Once all dry material is loaded continue to mix for 5-10 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 35-90°F (2-32°C). In cold weather placement, heated mixing water may be used. The maximum temperature of water used should not be greater than 100°F (38°C). In hot, dry weather installations, mixing water may be chilled. Use L&M ECON to protect surfaces from rapid drying.

Note: A 55 lb (25 kg) bag will yield approximately 0.4 ft<sup>3</sup> (0.01 m<sup>3</sup>) of material. 4175 lbs (1894 kg) of material or 1.4 super sacks is required to yield approximately 1 cubic yard.

### **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 and tacky EVERBOND/cement bonding slurry 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 typical concrete placement and finishing tools and methods to finish the surface. 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. Pan float blades may be used only after first complete pass with float shoes. Do not allow surface to dry. L&M ECON should be used several times before, during, and after bull float, power troweling, finishing, and joint cutting. If specified, leave a textured finish if extra non-slip performance is required.

### **Joints**

Using an early-entry dry-cut saw, joints should be cut within 1-4 hours after placement or as soon after topping slab is finished and hard enough to walk on without marring the surface or intended joints. Joints in EMERYTOP 400 topping slab must be placed matching the location of the joints in the base slab. If joints in base slab are greater than 10' X 10' additional saw cut joints may be needed so that a minimum of 10' X 10' joint spacing in the EMERYTOP 400 topping slab is achieved. All joints must be cut through the full depth of the topping slab and in to the base slab. After curing 60 days or more, control joints may be filled with JOINT TITE 750.

## Curing

Immediately after finishing use the "wet covering cure" method per ACI 302.1R for 7-10 days. Wet covering should be placed as soon as finishing is complete. Coverings should be kept wet so moisture remains in continuous contact with the surface throughout the curing period. Refer to ACI 302.1R Chapter 11 for more detailed information. The area may be opened to limited service after 48 hours while continuing with the wet covering cure for 7-10 days.

## PLASTIC CONCRETE INSTALLATION

### Substrate Concrete Requirements over Plastic Concrete

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).

### Mixing

Follow same methods and procedures for Placement over Hardened Concrete.

### Placement and Preparation over Plastic Concrete

Place the concrete and strike off using a vibratory screed leaving 1-2 inches for EMERYTOP 400 topping slab. Bull float immediately after strike off and before bleed water appears. After concrete bleed water has dissipated, darby (jitterbug) fresh concrete surface to produce a mortar bed approximately 1/4" (6 mm) thick, measured from the top of the coarse aggregate. Using a tining rake, score the concrete surface at right angle to a depth of approximately 1/8" (3 mm). A bonding agent is not required when EMERYTOP 400 is being placed on plastic concrete. 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. Operate the vibratory screed at 1/4 speed. Place the EMERYTOP 400 on the surface of the concrete immediately ahead of the vibratory screed. 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 typical concrete finishing tools and methods to finish the surface. 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. Do not allow surface to dry. L&M ECON should be used several times before, during, and after bull float,

power troweling, finishing, and joint cutting. Leave a textured finish if extra non-slip performance is needed.

## Finish, Curing and Joint Placement

Follow same methods and procedures for Placement over Hardened Concrete.

## 6. AVAILABILITY AND COST

### Availability

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 [laticrete.com](http://laticrete.com)

### Cost

Contact a LATICRETE Distributor in your area.

## 7. WARRANTY

See 10. FILING SYSTEM:

## 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 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. 1235

Telephone: +1.203.393.0010, ext. 1235

Fax: +1.203.393.1948

### Technical and Safety Literature

To acquire technical and safety literature, please visit our website at [laticrete.com](http://laticrete.com).

## 10. FILING SYSTEM

Additional product information is available on our website at [laticrete.com](http://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 176.5: JOINT TITE 750

- DS 174.4: DURACRETE™

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