**CPR-MD**

**MODERATE DUTY, FLOWABLE, CEMENTITIOUS POLYURETHANE MORTAR**

**DESCRIPTION:**
Smith’s CPR-MD is a 3-component, flowable, rake and trowel consistency Cementitious Polyurethane Mortar used to resurface and protect floors susceptible to Thermal Shock and water erosion in moderate traffic environments. CPR-MD also works well in damp conditions and on floors with slightly elevated moisture emission levels up to 85% Relative Humidity and up to 10 lbs.

**RECOMMENDED USES:**
- To resurface eroded concrete floor from 3/16” to 3/8” per lift
- Food Related areas to include:
  - Bakery Proofers
  - Breweries and Distilleries
  - Chillers/Freezers *(Once cured)*
  - Dairy Processing
  - Meat Processing
  - Commercial Kitchens and Restaurants
  - Grocery and Foodservice
- Pharmaceutical Plants
- Morgues
- Automotive Service Bays
- Vivarium’s
- Interior and Exterior Applications
- Does not Harbor Bacteria Growth
- Easy to clean
- Thermal Shock Resistant – For Service Temperatures between -50°F to 200°F
- Water Absorption (24 hour immersion) ASTM C413 <0.1%
- Impact Resistance - Tested on concrete block ASTM C3134 Pass
- Thermal Stability - Tested on concrete block MIL-D-3134J Section 4.6.3 No slip, flow, no softening or change in appearance
- Microbial Resistance ASTM G21 Pass #1

**HIGHLIGHTS:**
- Moderate Duty Traffic to include castor and forklift traffic
- Non-Tainting for areas at risk of food flavor contamination
- VOC Compliant in all regions
  - California 01350 Air Quality Compliant
  - LEED Compliant – Contains Rapidly Renewable Raw Materials
- Thermal Shock Resistant – For Service Temperatures between -50°F to 200°F
- Easy to clean
- Does not Harbor Bacteria Growth
- Interior and Exterior Applications
- High Chemical resistance
- High Durability
- Fluid consistency for gauge rake and trowel finishing
- Phthalate (BPA) Free

**STORAGE:**
Indoors between 40°F - 85°F

**INSTALLATION TEMPERATURE RANGE:**
50°F (10°C) to 85°F (29°C) with less than 80% Relative Humidity (air)

**SHELF LIFE:**
1 Year in original, unopened containers

**OPTIONS:**
- 8 Integral powder pigments
- 8 ISC Color Packs
- 13 Color Quartz Blends

**CURED COATING PROPERTIES (DRY FILM):**

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrasion Resistance, mg loss</td>
<td>ASTM D4060</td>
<td>100 mg (0.1 g) loss</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>ASTM C579</td>
<td>6,500 psi (44.8 MPa)</td>
</tr>
<tr>
<td>Flexural Strength</td>
<td>ASTM D790</td>
<td>1,500 psi (10.3 MPa)</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>ASTM 307</td>
<td>700 psi (4.8 MPa)</td>
</tr>
<tr>
<td>Adhesion to Concrete</td>
<td>ASTM D7234</td>
<td>450 psi (3.1 MPa)</td>
</tr>
<tr>
<td>Flammability</td>
<td>ASTM D635</td>
<td>Self-Extinguishing</td>
</tr>
<tr>
<td>Percent Elongation</td>
<td>ASTM D2370</td>
<td>6%</td>
</tr>
<tr>
<td>Shore D Hardness</td>
<td>ASTM D2240</td>
<td>80</td>
</tr>
<tr>
<td>Volatile Organic Compounds (VOC’s)</td>
<td>ASTM D3960</td>
<td>2 g/L mixed</td>
</tr>
<tr>
<td>Microbial Resistance</td>
<td>ASTM G21</td>
<td>Pass #1</td>
</tr>
<tr>
<td>Water Absorption (24 hour immersion)</td>
<td>ASTM C413</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>Thermal Stability / Heat Resistance</td>
<td>MIL-D-3134J Section 4.6.3</td>
<td>No slip, flow, no softening or change in appearance</td>
</tr>
<tr>
<td>Thermal Compatibility with Concrete</td>
<td>ASTM C884</td>
<td>Pass</td>
</tr>
<tr>
<td>Softening Point/ Service Temp (Constant)</td>
<td>ASTM C905</td>
<td>266°F (130°C)</td>
</tr>
<tr>
<td>Impact Resistance - Tested on concrete block</td>
<td>ASTM C905</td>
<td>Min. -100°F (37.7°C) Max. 230°F (110°C)</td>
</tr>
<tr>
<td>Impact Resistance - Tested on concrete block</td>
<td>ASTM D3134</td>
<td>Pass</td>
</tr>
<tr>
<td>Impact Resistance - Tested on concrete block</td>
<td>ASTM D2794</td>
<td>160 in.lbs.- no delamination/chipping</td>
</tr>
</tbody>
</table>

**POTLIFE & CURE TIMES (72°F / 50% Relative Humidity):**

<table>
<thead>
<tr>
<th>Property</th>
<th>Cured</th>
<th>Tack Free</th>
<th>Foot Traffic</th>
<th>Heavy Traffic</th>
<th>Working Time</th>
<th>Recoat</th>
<th>Heavy Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pot Life</td>
<td>17-20 min.</td>
<td>3-4 hours</td>
<td>12 hours</td>
<td>24-36 hours</td>
<td>15 min.</td>
<td>12 min.</td>
<td>24-36 hours</td>
</tr>
</tbody>
</table>

**APPROXIMATE COVERAGE:**
Coverage will vary depending on the application thickness, floor profile and absorbency of the concrete:

<table>
<thead>
<tr>
<th>Mil Thickness (inches)</th>
<th>Coverage per mixed kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8” (125 mils)</td>
<td>31 sq.ft.</td>
</tr>
<tr>
<td>3/16” (187 mils)</td>
<td>23 sq.ft.</td>
</tr>
<tr>
<td>1/4” (250 mils)</td>
<td>15 sq.ft.</td>
</tr>
<tr>
<td>3/8” (374 mils)</td>
<td>11.5 sq.ft.</td>
</tr>
</tbody>
</table>

*CS-17 Taber Abrasion Wheel, 1,000 gram load, 1,000 revolutions Results are based on conditions at 77°F (25°C), 50% relative humidity.
OIL CONTAMINATION: Oils can be a bond breaker and should be removed. Oils, chemical from spills, etc. which act as a bond breaker. Determining if a potential bond breaker exists and a proper course of remediation is recommended. Once a bond breaker is determined, Smith’s CPR can be used to repair and replace the oil contaminated area with new wood to ensure proper adhesion.

INSPECT THE SUBSTRATE: Ensure the concrete is free of contaminants or bond breakers, such as curing compounds, silicone, oil/grease, paint, densifiers/sealer, wax etc., and is structurally sound and solid. The concrete’s compressive strength must be >3,500 psi (24 MPa) at 28 days and >217 psi (1.5 MPa) in-situ tensile bond strength at the time of application.

CHECK FOR MOISTURE: Testing concrete moisture via both Calcium Chloride (ASTM F1869) and In-situ Relative Humidity testing (ASTM F2170) is recommended.

Acceptable Readings:
- Calcium Chloride testing (ASTM F1869) <10 pounds and between 8.5 to 11.5 pH
- Relative Humidity (ASTM F2170) <85%

Testing which occurs in non-acclimated interior environments will void the results. Follow the testing manufacturer’s instructions precisely or visit www.astm.org, see ASTM F1869 or F2170, to purchase the test methods.

INSPECT THE SUBSTRATE: Ensure the concrete is free of contaminants or bond breakers, such as curing compounds, silicone, oil/grease, paint, densifiers/sealer, wax etc., and is structurally sound and solid. The concrete’s compressive strength must be >3,500 psi (24 MPa) at 28 days and >217 psi (1.5 MPa) in-situ tensile bond strength at the time of application.
NECESSARY TOOLS and EQUIPMENT:
- Plastic Sheeting to cover floor for mix station
- 3-Blade or Bird Cage flat ring bottom style mixing paddle
- Low speed ½” drill (Variable Speed 650 rpm or less)
- Gauging tool:
  - Sled Style or CAM Gauge Rake with extension pole
- Mixing Buckets or Portable Mix Stations
- Paint Roller Frame with Extension Pole
- Spiked Porcupine Roller with Extension Pole
- Spiked shoes or Soccer Cleats
- Cleaning Solvent (Acetone, MEK, Xylene)
- Cleaning Sponge
- Paint Roller Frame with Extension Pole
- Mixing Buckets or Portable Mix Stations
- Spiked Porcupine Roller with Extension Pole
- Spiked shoes or Soccer Cleats
- Cleaning Solvent (Acetone, MEK, Xylene)

NOTE: The Mix station and all application equipment should be ready for immediate use prior to mixing any product due to the epoxy pot life once mixed. Only mix enough CPR-MD to be placed within 10 minutes allowing for proceeding batches to tie into the wet edge for an additional 10 minutes at 72°F. Higher temperatures and humidity will shorten pot life.

SUBSTRATE PREPARATION:

CLEANING: Detergent scrub with Smith’s Neutral Detergent, or similar, and rinse with clean, potable water to remove surface dirt, light surface grease/oil and contaminants prior to mechanical preparation. Heavy grease and oil should be removed using Smith’s Oil Clean. If a densifier or dissipative curing compound is believed to have been present, use Smith’s Green Clean Pro after mechanical preparation methods. Smith’s Green Clean Pro requires the use of water as a rinse and therefore will require a minimum of 90 minutes with forced air movement or overnight to dry prior to installation of Smith’s CPR-MD. Damp substrates may accelerate the cure of CPR-MD.

MECHANICAL PREPARATION: Achieve a CSP 3 to 6 (Concrete Surface Profile in accordance with ICRI Guideline 310.2R2013, as published by the International Concrete Repair Institute) yielding a surface texture similar to 80 grit sand paper or more course in order to maintain long term adhesion to the substrate.

Planetary Diamond Grinding is NOT an acceptable preparation method for CPR products.

Recommended preparation methods:
- **SCARIFY**
- **HYDROBLAST**
- **STEEL SHOT BLAST** (Shot size S-230 to S-330 grit recommended)

Using a 7” vacuumized shroud angle grinder, edge diamond grind around all tight areas, columns, around equipment, etc. Key in all termination points using a diamond cutting blade prior to any above preparation method. Score cutting with a diamond cutting blade on an angle grinder every 6 to 10 feet both North/South and East/West is recommended in areas prone to thermal shock exposure.

Should verification of proper adhesion be desired, follow ASTM D4541 using an Elcometer to determine a direct tensile pull-off strength greater than 250 psi (1.7 MPa) to pass the test.

JOINTS: Honoring of existing joints through the surface after the resurfacing layer is applied then filling will an appropriate joint filler can lessen joint telegraphing. Cut all joints open with a Diamond cutting blade and fill with an appropriate joint filler. Moving (non-static) joints and cracks with telegraph through CPR and is not an indication of delaminating/disbonding from the substrate. Please contact Smith Paints for recommendations for crack repairs, joint wall rebuilding, etc.

PRIMING: Although priming is not typically necessary, some conditions may make priming necessary, such as:
- Highly absorbent concrete may cause blisters in the finish of the CPR-MD and should be primed prior to installing CPR-MD
- When Moisture Vapor Transmission exceeds the maximum allowable rate (see page 2)
- Application over existing coating systems (contact Smith Paint Products for recommendations or install a test area to check for proper adhesion prior to proceeding with any application over existing coating)
- Non-porous substrates, especially smooth surfaces (contact Smith Paint Products for recommendations regarding substrates other that porous concrete or acid tile/brick)

When priming, use the following options:

- **Where Solvent Odor/Food Flavor Tainting is a concern:**
  - Smith’s Epoxy U100 or Epoxy FC125 at 7-10 mils immediately broadcasting Quartz sand over the fresh epoxy primer surface while the epoxy is still wet then allow to cure at 72°F:
    - Epoxy U100 5 hours or overnight
    - Epoxy FC125 2 – 3 hours

Once cured enough to walk, remove any loose sand from the primer. The sand broadcast ensures the CPR-MD will not slide across the primer during application and troweling.

- **Priming areas where Solvent Odor/Food Flavor Tainting is NOT a concern:**
  - Smith’s Polyaspartic 1000 Fast Cure at 7 to 10 mils with a heavy Quartz or Wedron Sand broadcast (40 mesh or more course) at a rate of roughly 0.25 lbs. per sq.ft. (roughly 200 sq.ft. per 50 lbs. bag) into the fresh primer allowing 60-90 minutes cure prior to removing excess sand then installing Smith’s CPR-MD. Although low in VOC’s, this method contains solvent that could result in food flavor tainting.

- **High moisture vapor readings:**
  - See page 2 using a 2 coat priming system with a broadcast into the second coat to achieve a mechanical anchor between primer and CPR-MD. CPR-MD will slide across a smooth, primed surface during application without a sand broadcast into the primer. DO NOT USE Silicate based “moisture vapor remediation” products for moisture vapor remediation prior to CPR-MD.
**CPR-MD**

**MODERATE DUTY, FLOWABLE, CEMENTITIOUS POLYURETHANE MORTAR**

**MIXING:** DO NOT PART MIX – MIX ENTIRE KIT

In a 5 gallon or larger mixing vessel, combine Part’s A and B as well as optional color packs mixing with a low speed drill for approximately 30-45 seconds. While continuing to mix slowly, add in the Part C while mixing for an additional 2 minutes to yield a lump free consistency. Ensure no unmixed powder pockets remain at the bottom of the mixing vessel before pouring out onto the substrate. It is recommended to start with smaller batches initially due to a short pot life. If a larger batch is desired, use a larger batch mixing station, such as a:

- **Mega Hippo model PMH 80X-RL** with a TW225D Mixing Paddle (15” Tall blade paddle) on an Ebinstock mixer (less than 450 RPM) or similar
- **Makinenx Mixing Station MS-100** with a Collomix Power mixer Xo 6 using an MK 160 HF or KR 160 HF mixing paddle

**HOT WEATHER THINNING:** CPR may be reduced in warmer application temperatures by adding up to 8 ounces of Mineral Spirits to an entire kit to improve workability. **DO NOT REDUCE THE PART C QUANTITY** as a means of increasing fluidity.

**APPLICATION:** Once mixed, immediately pour out CPR-MD in a straight bead onto the area to be resurfaced. Immediately spread using a gauge rake to meter the depth at the desired thickness and evenly cover the area. Continue placing fresh material against the wet edge of the previously spread mix and continue to spread while walking in the mixture with spiked/cleated shoes. Break the surface tension and bubbles using a Magic Trowel or smoother attached to an extension pole immediately following the gauging step. Use a rounded edge finishing trowel/pool trowel in difficult to reach areas.

Once the surface tension is relieved, lightly roll the porcupine roller around the surface to break any trapped air bubbles.

CPR-MD requires at least 4-5 people to install. Ideally, the mixing, delivery and pouring, Gauging, Smoothly and Porcupine roller steps have a dedicated person performing these activities. Larger projects with multiple batches being mixed concurrently will require more laborers.

**NOTE:** Do NOT Mix more CPR-MD than can be mixed, placed, finished and tied into with the next batches within a 10-15 minute window at 72°F and 50% Humidity. Higher temperatures and humidity will reduce this time frame.

Broadcasting may occur into the fresh CPR-MD. When broadcasting into the fresh surface, allow no less than 12 hours to cure prior to scraping and removing loose aggregates from the surface.

**COVERAGE:** *See chart on page 1 of this document

**OPTIONAL LAYERS or TOPCOATS:**

- **Broadcast Systems:** If topcoating or additional layers are desired over a broadcast surface, Smith’s CPR-MD does not require sanding of the surface (for adhesion).
- **Raw, trowel finished systems (without a broadcast):** Abrade the surface using 80 grit metal screens or sandpaper using an orbital low speed floor buffer or 150 grit metal bond diamonds using an appropriate diamond grinder to abrade the surface. Sanding may occur as soon as the surface is not able to be damaged by the desired method, typically after curing for about 12 hours. More aggressive grit screens or sandpaper may create scratches, swirls and grooves in the finish of the CPR-MD, especially within 12-14 hours after the initial application which topcoats and subsequent thin layers may not hide. Hard to reach areas or any depressions should be made uniformly dull using an orbital palm sander and 60 to 100 grit sandpaper. Done correctly, the surface should be uniformly dull with no scratches easily identified.

Once uniformly dull and properly abraded, vacuum the entire surface followed by either a thorough Acetone solvent tack rag wipe or use an auto-scrubber with white, soft nylon bristle brushes and a very mild neutral detergent, such as Smith’s Neutral Detergent, or dish detergent (DO NOT USE SIMPLE GREEN) and then a clean water rinse. Once dry, check the surface to ensure all dust has been removed before proceeding with the next layer. As an alternative, use a 100 grit resin bond Malish Diamabrush disk brush head on an auto scrubber or orbital floor buffer with Smith’s Neutral Clean and immediately rinse with potable water. **DO NOT ALLOW DETERGENT TO DRY ON THE SURFACE of CPR-MD. Rinse thoroughly.**

**MAINTENANCE:**

- **Unsealed (raw finished) CPR-MD** must cure for no less than 24 hours with no exposure to water, neutral detergents or cleaning equipment.
- **Smith’s Polyaspartics as the final wear surface** wait a minimum of 3 days before using mechanical cleaning equipment and 48 hours prior to water exposure and neutral cleaning. Only dust or damp (water dampened only) mop for the first few days.
- **All other finishes,** the coating system must be allowed to cure for no less than one week (7 days) before using any mechanical cleaning equipment on the surface and no less than 24 hours before neutral cleaner or water exposure. Only dust and wet mop the first week. This includes auto-scrubbers, swing buffers, sweepers, etc.
- **Regardless of the finish,** DO NOT EXPOSE to steam or freezing temperatures for at least 1 week to ensure proper curing and chemical resistance development.

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Regular cleaning, to include dust mopping, is crucial to maintain the appearance and to achieve the appropriate longevity of any floor coating system. Cleaning cannot occur too often. Spills should be removed quickly. Avoid the use of Polypropylene or abrasive bristle (Tynex®) brushes as these are known to create scratch patterns, lessen the floor coatings longevity and lower the sheen of the finish.

Proper maintenance will help to maximize your investment by removing particles that scratch and dull the appearance of a floor coating. The floor should be swept daily and scrubbed once per week or per month depending on the amount and type of soils present. Environments with oils or regulated by health departments will need a more strict cleaning regiment.

Caution: Do not drag or drop heavy objects across any floor, including coatings as scratching, gouging or chipping may occur to the concrete or the coating itself. This includes the tip of the forks on a forklift, nails protruding from pallets, etc.

Detergent: Always use the least aggressive detergent necessary to remove the residue. Typically, coated floors may only need a detergent scrub on a weekly or monthly basis depending on the environment. Daily dust mopping or water only mopping/scrubbing is highly recommended. Environments with exposure to foods, oils, chemicals, ink, etc. should be detergent scrubbed daily, possibly after every shift.

Rubber tires are prone to plasticizer migration, especially aviation tires and high performance car tires. Plasticizer will stain coating. The floor should be swept daily and scrubbed once per week or per month depending on the amount and type of soils present. Environments with oils or regulated by health departments will need a more strict cleaning regiment.

Avoid spinning tires on the surface of a coated floor. The heat created from the friction of a spinning tire will quickly soften the coating causing permanent damage to the finish.

Should a gouge, chip or scratch occur, touch-up the damaged areas immediately to avoid chemical or water intrusion to the concrete which could create additional damage. A thin layer of clear nail polish to the damaged area will provide some minimal protection until the area can be properly repaired.

SLIP RESISTANCE: Smith Paint Products recommends the use of angular slip-resistant aggregate in all coatings that may be exposed to wet, oily or greasy conditions as well as any condition where increased traction may be necessary. It is the contractor and end users’ responsibility to determine the appropriate traction needs and footwear necessary for the conditions as well as setting performance parameters prior to beginning the application, testing to determine parameters have been met upon completion to achieve the end users documented safety standards.

Mock-ups are highly recommended as part of the evaluation process to determine the appropriate amount of slip-coefficient necessary for the environment.

LIMITED LIABILITY: Liability is limited to replacement of defectively manufactured product of the same type and cost of the originally purchased product upon presentation of a valid, fully paid invoice at the time of a claim. No warranty shall be granted for outstanding invoices or for accounts with unpaid balances until paid in full. No damages, whether consequential, liquidated or other, shall be provided under this Limitation of Liability and Limited Warranty. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SMITH PAINT PRODUCTS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SHOULD YOU NOT AGREE WITH ANY OF THE ABOVE TERMS, DO NOT PURCHASE THE PRODUCT(S). Should a product defect be suspected at the time of application, cease use of the product immediately and notify Smith Paint Products for investigation as you will be responsible for the cost to repair or replace any work performed with product(s) suspected of defect. Record batch codes and save all products you purchased in case of future warranty claim. Defects determined after installation must be reported to Smith Paint Products within 10 business days of discovery.

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