

## Slurry Grade Heavy-Duty Urethane Concrete Mortar

**DESCRIPTION:**

**PIP UC-SM** is a self-priming, three or four (with colorpack) component, slurry grade, Heavy Duty Urethane Concrete Mortar.

**PIP UC-SM** is typically installed at 3/16" to 3/8" thickness.

**USES:**

**PIP UC-SM** is formulated specifically for the food and beverage industry. It offers ideal use in "can't dry" environments, areas subject to thermal cycling, and floors that will see high impact and hot water dumping. **PIP UC-SM** provides thermal shock protection against temperatures up to 220F. **PIP UC-SM** is a semi-rigid mortar and moves with the thermally induced expansion and contraction of concrete substrates. **PIP UC-SM** maintains superior chemical resistance to strong oxidizing agents, organic acids and aromatic solvents.

**ADVANTAGES:**

- Available in a neutral base with on site colorpack tinting.
- Virtually odorless
- Formulated free of phthalate plasticizers
- High chemical resistance
- Rapid cure (hours, not days)
- Moisture vapor tolerant
- Excellent impact and abrasion resistance
- Seals concrete, protecting against dirt and spills
- Resists staining and major chemical spills of cleaning and industrial chemicals
- Complies with VOC regulations for Industrial Maintenance Coatings in the OTC and CA.
- Wide service temperature range (-100F-212F boiling water or steam)
- Cure time can be reduced by UC-Accelerator in cold application temperatures
- Can be applied to 7 to 14 day old concrete

**STORAGE:** Materials should be stored in original un-opened containers indoors between 65°F (18°C) and 90°F (32°C) and at or below 50% RH. Protect liquids from freezing.

**SHELF LIFE:** Un-opened containers 1 year from date of manufacture.

**PACKAGING KITS/ PART NUMBERS/ Coverage:**

**Volume Mix Ratio for Neutral liquids: 1A: 1B**

**One Pint of UC-CP-(color) tints 10 mixed gallons.**

**.68 cu.ft. kit ( 44 sq ft @ 3/16" ) OR (33 sq. ft @ 1/4")**

UC-A/1 (1 gal)

UC-B/1 (1 gal)

3 fl. oz UC-CP-(color)

UC-SM-TG Aggregate/32\* (32 lb.) – 2 bags.

**3.4 cu.ft. kit ( 216 sq ft @ 3/16" ) OR (163 sq. ft @ 1/4")**

UC-A/5 (5 gal)

UC-B/5 (5 gal)

16 fl.oz UC-CP-(color)

UC-SM-TG Aggregate/32\* (32 lb.) – 10 bags.

**36.7 cu.ft. kit ( 2350 sq ft @ 3/16" ) OR (1762 sq. ft @ 1/4")**

UC-A/55 (54 gal)

UC-B/55 (54 gal)

11-16 fl.oz UC-CP-(color)

UC-SM-TG Aggregate/32\* (32 lb.) – 108 bags.

**183.6 cu.ft. kit ( 11749 sq ft @ 3/16" ) OR (8812 sq. ft @ 1/4")**

UC-A/TOTE (270 gal)

UC-B/TOTE (270 gal)

54-16 fl.oz UC-CP-(color)

UC-SM-TG Aggregate/32\* (32 lb.) – 540 bags.

**OPTIONS:**

To fill deeply spalled area, or to re-slope the concrete substrate, a suitable fast setting concrete mortar (**PIP Rapid Mortar**) can be installed prior to the **PIP UC-SM**. The repair concrete mortar will need to be shot blasted the following day prior to installing the **PIP UC-SM**. Alternatively, PIP UC-DF, a urethane concrete based material designed for filling deeply spalled or pre-levelling concrete may be used prior to application of PIP UC-SM. PIP UC-DF must be placed into a wet 100% solids epoxy primer (such as, but not exclusively, PIP 1000 HB series) and allowed to cure for at least 12 hours prior to applying the PIP UC-SM. Application of PIP UC-SM pre-maturely may cause blistering of the PIP UC-SM. Contact Protective Industrial Polymers for additional site specific recommendations.

PIP 1200 WR primer IS NOT RECOMMENDED AS A SUITABLE PRIMER FOR PIP UC-DF.

**Traction:** Suitable angular aggregate can broadcast into wet mortar and then lock coated with **PIP UC-FC** or approved topcoat.

PIP UC-SM may be broadcasted while wet with either a neutral silica sand or decorative colored quartz (**PIP DS-Quartz**) aggregate and topcoat with either a pigmented **PIP UC-FC** lock coat or an approved epoxy or urethane. This will render the surface more consistent in color and texture. See **Application Instructions for PIP UC-SM for further details.**

Contact Protective Industrial Polymers for other approved sources.

**LIMITATIONS:**

Substrates: **PIP UC-SM** must be applied to a properly prepared, clean concrete substrate.

**Contamination and surface defects (fisheyes):** If contaminants of oils, silicones, mold release agents and/or others are present, **PIP UC-SM** may fisheye or crawl away from the surface. Surface contaminants should be removed with a suitable detergent prior to application. **PIP UC-SM** will amber over time from UV exposure. Do not apply material directly to metallic substrates, elastomeric membranes, FRP, or asphaltic materials without first consulting Protective Industrial Polymers.

**PIP UC-SM**

Slurry Grade Heavy-Duty Urethane Concrete Mortar

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PROTECTIVE INDUSTRIAL  
POLYMERS

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440-327-0015 440-353-0549 - FAX

**MATERIAL PROPERTIES\*:**

Properties	Test Method	Results
Flash Point	ASTM D3278	≥215 °F (102°C)
Volume Solids (incl. Part C)	ASTM D2369	95 %
Mixed Viscosity (resin only)	ASTM D2196	400-700 cPs
VOC-Volatile Organic Compound	ASTM D3960	0 g/l

**CURED PROPERTIES\*:**

Properties	Test Method	Results
Abrasion Resistance Taber CS-17 mg loss/1000 cycles/1000g mass	ASTM D4060	110 mg
Coefficient of Friction-COF James Test	ASTM D2047	0.65
Tensile Strength	ASTM C307	960 psi
Compressive Strength	ASTM C579A	6700 psi
Flexural Strength	ASTM C580	2100 psi
Adhesion to Concrete	ASTM D4541	350 psi concrete failure
Density	ASTM C 905	16.44 lbs.gal
Impact	ASTM D2794	>160 in.lbs
Thermal Coefficient of Linear Expansion	ASTM C531	1.6 x10 <sup>-5</sup> in/in/°F
Application Thickness		3/16" minimum

\*Properties and results are based on laboratory testing at 72°F (22°C) %50 RH, theoretical calculations and estimates. Typical properties, as stated, are to be considered as representative of current production and should not be treated as specifications.

**CHEMICAL RESISTANCE\*:**

PIP UC-SM	1 Day	7 Days
<b>ACIDS, INORGANIC</b>		
10% Hydrochloric	E	E
30% Hydrochloric	F	P
10% Nitric	E	E
50% Phosphoric	G	F
37% Sulfuric	E	E
<b>ACIDS, ORGANIC</b>		
10% Acetic	G	F
10 % Citric	E	G
Oleic	E	E
<b>ALKALIES</b>		
10% Ammonium Hydroxide	E	E
50% Sodium Hydroxide	E	E
<b>SOLVENTS</b>		
Ethylene Glycol	G	G
Isopropanol	E	E
Methanol	P	P
d-Limonene	E	E
Jet Fuel	E	E
Gasoline	G	F
Mineral Spirits	E	E
Xylene	E	G
Methylene Chloride	P	P
MEK	P	P
PMA	G	G
<b>MISCELLANEOUS</b>		
20% Ammonium Nitrate	E	E
Brake Fluid	E	E
Bleach	E	E
Motor Oil	E	E
Skydrol®500B	E	E
Skydrol®LD4	E	E
20% Sodium Chloride	E	E
10% TSP	E	E

\*Based on spot testing of the clear coating after 14 days of cure. Pigmented versions may see reduced chemical resistance and staining.

Legend: E- Excellent (Not Effected) - Recommended  
G-Good (Limited Negative Effect) - Short Term Exposure  
F-Fair (Moderate Negative Effect) - Not recommended  
P-Poor (Unsatisfactory) - No Resistance to Exposure

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### INSPECTION AND APPLICATION:

**Caution! Follow all precautions and instructions prior to installation.**

**CHECK THE SUBSTRATE CONCRETE:** Substrate concrete must be free of curing membrane, silicate surface hardener, paint, or sealer and be structurally sound. If you suspect the concrete has been treated or sealed, prepare substrate for complete removal of treatment.

**MOISTURE:** Moisture and moisture vapor transmission rates are dynamic in nature and may change over time. Initial testing does not guarantee future results. If the relative humidity of the concrete substrate is over 99% (using ASTM F2170), Protective Industrial Polymers must be consulted and issue a written moisture mitigation recommendation prior to product use.

**EXCLUSION:** Testing for moisture is important, however it does not guarantee against future problems. If there is no vapor barrier or the vapor barrier is damaged, this too can contribute to floor failure. Contamination to concrete from oils, chemicals, excessive salts or Alkali Silica Reaction (ASR) may also contribute to floor failure.

**CHECK THE TEMPERATURE AND HUMIDITY:** During the application and cure of the coating, the substrate temperature, material temperature and room conditions should be maintained between 65°F (18°C) and 90°F (32°C). Relative Humidity (RH) should be limited to 30-80%. DO NOT apply coatings unless the floor temperature is more than five degree over the dew point.

### APPLICATION EQUIPMENT:

- **Protective equipment and clothing as called for in the SDS (Safety Data Sheet)**
- **"KOL Mixal" electric powered mortar mixer (Model M-61-BM 1HP)**
- **Screed Rake/ Cam Rake**
- **Hand Trowel**
- **Drill motor mixer with mud mix blade**
- **Porcupine roller/Loop roller/ 1/4 " Mohair roller**
- **Surface grinders**
- **Vacuum equipment**

### PREPARATION:

Surface dirt, grease, oil and contaminants must be removed by detergent scrubbing and rinsing with clean (clear) water. Concrete Scarification or Heavy Shot Blasting (bare concrete) is the recommended method of surface preparation.

**JOINTS:** Construction joints may need to be re-built and re-cut and then filled with semi-rigid joint filler. Isolation or expansion joints must be filled with a flexible material designed for expansion and should not be coated over. All construction/control joints in the concrete must be honored (IE: Re-cut and filled in the mortar). Control joints must be filled with a semi-rigid joint compound such as **PIP JF-Epoxy or JF-Polyurea**.

**BARE CONCRETE APPLICATION:** PIP UC-SM Mortar MUST BE APPLIED OVER bare and well prepared concrete. Under most conditions a primer is not required or recommend.

**EXISTING EPOXY SUBSTRATE-**Existing overlay must be shot-blasted or diamond ground, and primed with a high solids epoxy primer such as PIP 1000 series epoxy. PIP UC-SM must be applied directly into the wet primer. Do not allow epoxy primer to cure before application of the PIP UC-SM mortar. If the primer is broadcasted with silica sand, allow the broadcast to cure until it can support foot traffic before application of the PIP UC-SM mortar.

### Mix Instructions for PIP UC-SM

Pre-mix the 5 gallon pail of UC-A/5 Part A with a high speed drill and jiffy mix paddle for 1 minute to re-constitute any separation that may have occurred with storage or shipping.

Then add 16 fl. oz. UCCP-(color) and mix for a minimum of 1 minute or until color is uniform throughout the pail. Then pour off 1 gallon of tinted Part A, and transfer into a 5 gallon mixing container. Pour off 1 gallon of UC-B Part B. Mix these together for 1 minute with a high speed drill and mortar jiffy style mixing paddle.

With the mixer running, gradually add 2 bags of UC-SM/32 aggregate until a homogenous mix is attained. Mixing time after aggregate is added is a minimum of 1.5 minutes. Complete and consistently timed mixing is necessarily for uniform handling, leveling and final appearance.

It is vitally important to mix material until it is lump free. If mix contains lumps of un-dispersed aggregate blend, blisters will likely

### PIP UC Accelerator

To hasten cure in colder temperatures or tight time schedules, and to shorten the recoat time of epoxy topcoats the addition of PIP UC Accelerator is recommended. Please see PIP UC Accelerator Product Data Sheet for specific information on dosing requirements and cure times.

### Application Instructions for PIP UC-SM

Apply **PIP UC-SM** at a thickness of 3/16"-3/8" to the floor surface using a screed rake, cam rake, hand trowel or screed box. Trowel the wet mortar to compact and even the material, and then use a looped roller to further even the material and working liquids to the surface. Broadcast any optional top aggregate while mortar is wet.

Working time including mixing is limited to 15-20 minutes. Surface will stiffen and become unworkable after 20 minutes. Mix equipment and tools will need to be cleaned multiple times during the application to keep materials from setting up prematurely.

**CURING (DRYING):** After approximately 6 hours at 75°F (24°C) and 50% RH the floor should support foot traffic or the ability for installers to sweep off excess quartz broadcast. Allow more time for low temperatures and higher humidity or for heavier traffic. Full physical properties are achieved after 3 days.

Follow the recommended cure times depending on the top coat type used.

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### TOPCOATING (Epoxy or Polyaspartic )

Application of a high solids epoxy or polyaspartic topcoat direct to a smooth Urethane Concrete is not typically a recommended practice due to reasons of inferior thermal shock, adhesion, and moisture vapor transmission. If PIP UC-SM is applied without a broadcast and top coated with a high solids epoxy or polyaspartic coating, the UC-SM must be allowed to cure for minimum of 12 hours so that complete evacuation of CO<sub>2</sub> gas and water is achieved. Failure to do so may result in tiny bubbles within the top coat. Acceleration of the PIP UC-SM can reduce this time. See technical data sheet for PIP UC Accelerator for general guidelines. Contact PIP for additional information and site specific recommendations.

### TOPCOATING (Cementitious Urethane)

PIP UC-FC cementitious urethane concrete topcoat may be applied as soon as the floor is capable of supporting traffic of application. At 70F, this may be as short as 6 hours. As PIP UC-FC is based on an aromatic urethane, it has poor color retention and will yellow over time. If a cementitious urethane topcoat is specified and UV properties are required, PIP UC-UV, a cementitious aliphatic urethane may be used. See PIP UC-UV for additional detailed information and limitations.

### TOPCOATING (Polyurethane)

PIP UC-SM applied neat without a broadcast may be top coated directly with PIP 2000 or 2100 series urethanes. For best results, two coats are recommended as one coat may not sufficiently hide or coat evenly producing an irregular sheen. In two coat applications, it is strongly recommended to use PIP 2100 satin as the first coat. PIP 2100 satin best wets and covers the PIP UC-SM surface and provides the best anchor for the urethane top coat.

**TECHNICAL SUPPORT:** For application questions, please contact your salesman or PIP technical service at 440-327-0015.

**DISPOSAL:** Dispose in accordance with federal, state, and local regulations.

**READ SDS (SAFETY DATA SHEET) FOR SAFETY AND PRECAUTIONS. USE PRODUCT AS DIRECTED. FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.**

### MAINTENANCE GUIDELINES:

**Allow floor coating to cure at least one week before cleaning by mechanical means (IE: sweeper, scrubber, disc buffer).**

**CARE:** Increased life of the floor will be seen with proper maintenance and will help maintain a fresh appearance of your new Protective Industrial Polymers floor. Regularly sweep to avoid ground in dirt and grit which can quickly dull the finish, decreasing the life of the coating. Spills should be removed quickly as certain chemicals may stain and can permanently damage the finish. Only soft nylon brushes or white pads should be used on your new floor coating. Premature loss of gloss can be caused by hard abrasive bristle Polypropylene (Tynex®) brushes.

**CAUTION:** Heavy objects dragged across the surface will scratch all floor coatings. Avoid gouging or scratching the surface.

Pointed items or heavy items dropped on the floor may cause chipping or concrete pop out damage. Plasticizer migration from rubber tires can permanently stain the floor coating. If a rubber tire is planned to set on the floor for a long period of time, place a piece of acrylic sheet between the tire and the floor to prevent tire staining. Rubber burns from quick stops and starts from lift trucks can heat the coating to its softening point causing permanent damage and marking.

**REPAIR:** Repair gouges, chip outs, and scratches as soon as possible to prevent moisture and chemical under cutting and permanent damage to the floor coating.

### WARRANTY AND CONDITIONS OF USAGE

**WARRANTY AND LIMITATION OF LIABILITY:** Protective Industrial Polymers Inc. ("PIP") warrants that its products shall conform to the manufacturer's written specifications and shall be free from defects for one (1) year from the date of purchase. PIP MAKES NO WARRANTIES, IMPLIED OR OTHERWISE, AS TO THE MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSES OF ITS PRODUCTS AND EXCLUDES AND DISCLAIMS THE SAME, INCLUDING, WITHOUT LIMITATION, FAILURE OF THE PRODUCT DUE TO ACTS OF GOD, FLOODING, EXTREME OR ABNORMAL TEMPERATURES, HUMIDITY AND MOISTURE, STRUCTURAL CONDITIONS, SITE PREPARATION AND CONDITIONS, ACCIDENTS, DAMAGE CAUSED BY INSTALLATION OF MACHINERY, EQUIPMENT OR FIXTURES WITHOUT ADEQUATE FLOOR PROTECTION OR WITHOUT ADEQUATE TIME FOR CURING, FAILURE TO COMPLY WITH CONDITIONS OF USAGE (SPECIFIED BELOW), VANDALISM, NEGLIGENT OR INTENTIONAL ACTS OF THIRD PARTIES OR OTHER CASUALTIES. If any PIP product fails to conform to this warranty, PIP shall either replace the product at no cost to Buyer or refund the cost of the product, in PIP's sole discretion. Replacement of any product or a refund of the cost of any product shall be the sole and exclusive remedy available to buyer, and buyer shall have no claim for incidental, special or consequential damages, including, without limitation, business interruption damages. Any warranty claim must be made within one (1) year from the date of delivery of products. PIP does not authorize anyone on its behalf to make any written or oral statements which in any way alter PIP's warranty or installation and storage information or instructions in its product literature or on its packaging labels. Any installation of PIP products which fails to conform to such installation information or instructions or the "Conditions of Usage" (specified below) shall void this warranty. Product demonstrations, if any, are done for illustrative purposes only and do not constitute a warranty or warranty alteration of any kind. Buyer shall be solely responsible for determining the suitability of PIP's products for the Buyer's intended purposes.

**CONDITIONS OF USAGE:** Installation of all products purchased must be by professional installers periodically published by PIP or otherwise approved by PIP in writing. Modification to any of PIP's products voids the warranty. The installer shall maintain a written contemporaneous record of field conditions (including, without limitation, surface and atmospheric conditions, usage rates, and lot numbers of products installed). PIP reserves the right of inspection of any installed product, installation and maintenance records and records of field conditions and may conduct additional testing as is reasonably required to investigate any warranty claims. Warranty shall only apply for products or materials that have been paid for in full. Moisture Vapor Transmission (MVT) and ASR (Alkali Silica Reaction) Disclaimer and Exclusion: Although rare, some floors at or below grade level are sometimes subjected to saturation by moisture from beneath the concrete floor slab. This moisture can travel through the concrete and collect between floor toppings creating the potential for delaminating from hydrostatic pressure and or ASR. Conditions contributing to this include heavy rainfall, broken pipes, excess hydration within fresh concrete, and other factors or defective and old concrete. These factors are difficult, if not impossible to predict. PIP recommends testing for MVT and/or the presence of ASR in the concrete substrate prior to applying any polymer floor topping. The recommended test method for MVT is ASTM F 2170-11. ASR can be predicted by a higher than normal pH within the concrete. If high pH should be detected, it is recommended a lab test for ASR. If and when delamination of the floor occurs because of a moisture condition that exists beneath or in the concrete slab beyond the capacity of the individual product installed or failure of the concrete due to ASR, this Limited Warranty does not extend to such delaminating or topping failure. This writing constitutes the sole and only agreement of warranty relating to PIP products.