Technical Data Sheet

PIP UC-DF

Heavy-Duty Deep Fill Grade Urethane Concrete Mortar

PROTECTIVE INDUSTRIAL POLYMERS
7875 Bliss Parkway North Ridgeville, OH 44039
440-327-0015 440-353-0549 - FAX

DESCRIPTION:
PIP UC-DF is a three component Urethane Concrete Mortar designed primarily for pre-filling, deep filling and sloping prior to application of a PIP Urethane Concrete flooring system. PIP UC-DF may be installed at thicknesses ¼" to 4 inches.

USES:
PIP UC-DF is formulated for use to pre-fill or add slope to an area prior to applying a urethane concrete flooring system. 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-DF provides thermal shock protection against temperatures up to 250F. PIP UC-DF is a semi-rigid mortar and moves with the thermally induced expansion and contraction of concrete substrates.

ADVANTAGES:
- Available in a neutral base with on-site color pack tinting.
- Excellent Hand Trowel ability
- Virtually odorless
- Formulated free of phthalate plasticizers
- Rapid cure (hours, not days)
- Moisture vapor tolerant
- Complies with VOC regulations for Industrial Maintenance Coatings in the OTC and CA.
- Wide service temperature range (-100F-212F boiling water or steam)
- 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 liquids: Quart A: Quart B: 35 lb bag UC-DF/35

324 cu.ft. Kit (3888 sq ft @ 1") (1080 single bag mixes)

UC-A/TOTE (270 Gallons)
UC-B/TOTE (270 Gallons)
UC-DF/35 Aggregate – 1080 Bags

6.00 cu.ft. Kit (72 sq ft @ 1") (20 single bag mixes)

UC-A/5 (5 Gallons)
UC-B/5 (5 Gallons)
UC-DF/35 Aggregate – 20 Bags

1.2 cu.ft. Kit (14.4 sq ft @ 1") (4 single bag mixes)

UC-A/1 (1 Gallon)
UC-B/1 (1 Gallon)
UC-DF/35 Aggregate – 4 Bags

LIMITATIONS:
Substrates: **PIP UC-DF MUST be applied into wet or tacky high solids epoxy primer such as PIP 1000 Series epoxies. PIP 1000 CR is the preferred primer. Do not let the primer cure to foot traffic ready. If the primer has cured hard or is beyond the tacky or "B-stage," re-prime with additional epoxy and then apply the PIP UC-DF**. Failure to follow this instruction will likely result in bond failure or excessive stress cracking.
PIP 1200 WR primer IS NOT RECOMMENDED AS A SUITABLE PRIMER FOR PIP UC-DF.

Do not apply material directly to metallic substrates, elastomeric membranes, FRP, or asphaltic materials without first consulting Protective Industrial Polymers.

MATERIAL PROPERTIES*:

Properties	Test Method	Results
Flash Point	ASTM D3278	≥215 °F (102°C)
Volume Solids (incl. Part C)	ASTM D2369	97 %
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	135 mg
Coefficient if Friction-COF James Test	ASTM D2047	0.65
Tensile Strength	ASTM C307	900 psi
Compressive Strength	ASTM C579A	6800 psi
Flexural Strength	ASTM C580	1750 psi
Adhesion to Concrete	ASTM D4541	350 psi concrete failure
Impact	ASTM D2794	>160 in.lbs
Density	ASTM C905	17.68 lbs.gal
Thermal Coefficient of Linear Expansion	ASTM C531	$1.1x10^{-5}$ in/in/°F
Application Thickness		1/4" minimum

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*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.

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%.

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)**
- **Ted Baugh Epoxy Mortar Mixer**
- **Screed Box/Screed Rake/ Cam Rake**
- **Hand Trowel**
- **Power Trowel**
- **1/4 "Mohair roller**
- **Surface grinders**
- **Vacuum equipment**

PREPARATION:
Surface dirt, grease, oil and contaminates must be removed by detergent scrubbing and rinsing with clean (clear) water.
Concrete Scarification or Heavy Shot Blasting (bare concrete) is the preferred 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.

Existing Epoxy or UC Overlay – It is highly recommended that the existing overlay be shot-blasted or diamond ground. The substrate must be primed with an epoxy primer before applying PIP UC-DF. The PIP UC-DF must be applied into a wet primer.

MIXING: Working time including mixing is limited to 10-15 minutes. Surface will harden and become unworkable after 15 minutes. Mix equipment and tools will need to be cleaned multiple times during the application to keep materials from setting up prematurely.

Mix Instructions for PIP UC-DF
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. Drums of Part A must be thoroughly pre-mixed with a drum mixer or rig that permits complete mixing of the contents in the drum before decanting from it.
Pour off 1 quart of Part A, and 1 quart Part B. Mix these together in a separate mixing pail for 1-2 minutes with a drill and jiffy mix paddle. Immediately add mixture to mortar mixer and 1 bag of UC-DF/35 aggregate and mix for 2 minutes. It is absolutely critical to be certain that the aggregate is mixed well and evenly wetted to achieve uniform handling, trowelling and performance properties. Immediately transfer mix to floor and apply with a screed rake, screed box or hand trowel. **DO NOT LEAVE ANY MORTAR IN THE MIXER AS IT WILL HARDEN!**

EXTENSION-
For deeper applications over 1 inch, PIP UC-DF may be extended with 1/4-1/2 inch pea gravel for economy and less bond stress. Up to 25 lbs can be added per single 35 lb bag of UC-DF. Coverage and size of mix using this amount will increase by approximately 55%.

Application Instructions for PIP UC-DF
Apply PIP UC-DF at a thickness of 1/4"-4" to the **wet primer** using a screed rake, cam rake, hand trowel or screed box. Trowel the wet mortar to compact and even and close the surface of the material working liquids to the surface.

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): Allow the mortar to cure (dry) for a minimum of 12 hours at 75°F (24°C) and 50% RH prior to applying an additional layer of PIP UC urethane concrete. Application of PIP UC material pre-maturely may cause blistering. Contact Protective Industrial Polymers for additional site-specific recommendations. Allow more time for low temperatures and higher humidity or for heavier traffic.

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

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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 MOSITURE, 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.