Technical Data Sheet

PIP 3100 RR

Resin-Rich Epoxy Mortar System

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

DESCRIPTION:

PIP 3100 RR is a three-component, resin-rich, epoxy mortar system. **PIP 3100 RR** is supplied with a chemical-resistant curing agent and is designed for superior chemical resistance and physical properties when compared to traditional epoxy mortars. **PIP 3100 RR** is designed primarily for power trowel at an application thickness of 3/16" to 1/4".

USES:

This system is designed for restoring old or damaged concrete by creating a dense protective layer. It also serves applications requiring increased abrasion and impact protection combined with chemical resistance. PIP 3100 RR is suited for industrial applications where a densely compacted resin-rich epoxy mortar is specified to elevate abrasion and chemical resistance properties.

ADVANTAGES:

- Extremely low odor
- Easy 2:1 Mix ratio of liquids
- Dense system increases chemical resistance
- Maximum impact and abrasion resistance
- Seals substrate to create environmental barrier
- Resists staining from cleaning and industrial chemicals
- Complies with VOC regulations for Industrial Maintenance Coatings in the OTC and CA.
- LEED MR 4.1 Qualification attainable with partial aggregate substitution with PIP Recycled Glass.

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

SHELF LIFE: 1 year from date of manufacture (un-opened).

PACKAGING KITS/ PART NUMBERS:

1.38 Cubic Foot Kit PIP 3100 RR Epoxy Mortar- 88 SF @3/16"

3100-A/2 (2 gallons)
3100-B/1 (1 gallon)
3000-Series Coarse Aggregate 150 lb. (3 bags)*

** LEED MR 4.1 Qualification attainable with 1 bag substitution (50 lb.) of PIP Recycled Glass for 1 bag of 3000-Series Coarse Aggregate.*

6.9 Cubic Foot Kit PIP 3100 RR Epoxy Mortar- 442 SF @3/16"

5 mixes consisting of 2 gal. Pt A, 1 gal Part B and 3 bags aggregate Each mix covers 85 SF @ 3/16".
(2) 3100-A/5 (5 gallons ea.)
(1) 3100-B/2 (5 gallons ea.)
(15 bags) 3000-Series Coarse Aggregate (750 lb.)*

** LEED MR 4.1 Qualification attainable with 5 bag substitution (250 lbs.) of PIP Recycled Glass for 5 bags of 3000-Series Coarse Aggregate.*

73.15 Cubic Foot Kit PIP 3100 RR Epoxy Mortar- 4681 SF@3/16"

53 mixes consisting of 2 gal. Pt A, 1 gal Part B and 3 bags aggregate Each mix covers 85 SF @ 3/16".
(2) 3100-A/55 (53 gallons ea.)
(1) 3100-B/55 (53 gallons ea.)
(159 bags) 3000-Series Coarse Aggregate (7950 lb.)*

** LEED MR 4.1 Qualification attainable with 53 bag substitution (2650 lb.) of Recycled Glass for 53 bags of 3000-Series Coarse Aggregate.*

OPTIONS:

Product may be tinted when desired with the use of a PIP CPU colorpack. Recommended use is 1/2 pint of CPU color pack per 3 bag mix.

LIMITATIONS:

Contamination and surface defects: If contaminates including oil, silicone, mold release agents and/or other materials are present, product may crawl away from the surface. All surface contaminates should be removed with a suitable detergent prior to application. Solvent cleaning of silicone based contaminates is NOT RECOMMENDED; please contact Protective Industrial Polymers' technical service for additional recommendations. **PIP 3100 RR** will amber over time from UV exposure. Top coating with an aliphatic pigmented urethane will provide UV stability.

MATERIAL PROPERTIES*:

Properties	Test Method	Results
Flash Point	ASTM D3278	≥215 °F (102°C)
Volume Solids (mixed)	ASTM D2369	100 %
Mixed Viscosity (resin only)	ASTM D2196	400-700 cPs
Dry Time	ASTM D5895	Tack Free 4-6 hr Dry 6-10 hr Full Cure 7 days
VOC-Volatile Organic Compound	ASTM D3960	0 g/l clear ≤50 g/l with pigment pack

CURED PROPERTIES*:

Properties	Test Method	Results
Abrasion Resistance Tabor H-10, mg loss/1000 cycles/1000g mass	ASTM D4060	300 mg
Coefficient if Friction-COF James Test	ASTM D2047	0.55 0.65(w/NS-36)

Technical Data Sheet

PIP 3100 RR

Resin-Rich Epoxy Mortar System

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

Compressive Strength	ASTM C579A	15,000 psi
Compressive Strength	ASTM D695	14,000 psi
Modulus psi	ASTM D695	$3.06x10^5$
Adhesion to Concrete	ASTM D4541	400 psi concrete failure
Impact	ASTM D2794	12 in.lbs Direct & Reverse
Modulus of Elasticity	ASTM C580	$1.9x10^6$ psi
Minimum Applied Thickness		3/16" or 5 mm

*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.

RECOMMENDED APPLICATION RATE: PIP 3100 RR should be applied at a minimum 3/16 inch or 5 mm.

CHEMICAL RESISTANCE*:

PIP 3100 RR Binder	1 Day	7 Days
ACIDS, INORGANIC		
10% Hydrochloric	E	E
30% Hydrochloric	F	P
10% Nitric	E	E
50% Phosphoric	G	F
37% Sulfuric	E	E
ACIDS, ORGANIC		
10% Acetic	G	F
10 % Citric	E	G
Oleic	E	E
ALKALIES		
10% Ammonium Hydroxide	E	E
50% Sodium Hydroxide	E	E
SOLVENTS		
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
MISCELLANEOUS		
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)**
G-Good (Limited Negative Effect)
F-Fair (Moderate Negative Effect)
P-Poor (Unsatisfactory)

INSPECTION AND APPLICATION:
Caution! Follow all precautions and instructions prior to installation.

SUBSTRATE: The concrete substrate 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 75% (using ASTM F2170), Protective Industrial Polymers must be consulted and issue a written moisture mitigation recommendation prior to product use.

VAPOR/CONTAMINATION: Concrete must be dry before applications of this floor coating. Test concrete for moisture vapor transmission (MVT) using in-situ RH testing ASTM F2170. Do not exceed a maximum result of 75% RH (internal concrete humidity) without approved treatment.
Testing for MVT is effective, however it does not guarantee against future problems. If there is no vapor barrier or the vapor barrier is damaged, vapor transfer can contribute to floor failure. Contamination to concrete from oils, chemicals, excessive salts or Alkali Silica Reaction (ASR) may also contribute to floor failure. Contact your PIP technical representative for further information.

Technical Data Sheet

PIP 3100 RR

Resin-Rich Epoxy Mortar System

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

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 – Refer to SDS (Safety Data Sheet)**
- **Motorized mortar mixer.**
- **Screed Box.**
- **Hand Trowel.**
- **Power Trowel.**

PREPARATION:
Surface dirt, grease, oil and contaminates must be removed by detergent scrubbing and rinsing with clean (clear) water.
Mechanical Preparation: Shot Blasting or grinding the surface is the preferred method of preparation. A minimum surface profile of ICRI CSP 5 is recommended.
JOINTS: All non moving joints (control joints) can be filled with a rigid or semi-rigid joint compound. Construction joints may be filled with semi-rigid joint filler and might need to be re-built and re-cut depending on conditions. Isolation or expansion joints must be filled with a flexible material designed for expansion and should not be coated over.

PRIME: **PIP 3100 RR** SHOULD BE APPLIED OVER A WET or TACK B STAGED EPOXY PRIMER for maximum performance. If this is not possible, seed the wet primer with a silica sand aggregate providing a surface profile and tooth for bond. PIP 3100 RR liquids may be used for this primer. PIP 1000 series (FS, CR and HB) are also suitable primers. Care should be taken not to excessively puddle primers as this may cause uneven grout coat consumption and appearance.

MIXING: Mix 2 gallons of **3100- A**, 1 gallon of **3100-B** and ½ pint (8 0z.) (optional) of **PIP CPU colorpack i**nto the running mortar mixer for a minimum of 1 minute. Add 3 bags (150 pounds) of 3000-Series Course Aggregate. Mix for 3 minutes. Transfer to screed box to apply to the floor. **NOTE: ANY MORTAR LEFT IN THE MIXER FOR EXTENDED PERIODS OF TIME WILL HARDEN!**
Certain conditions such as temperature, slope requirements, mixing efficiency, and desired handling characteristics may require a drier mix. The addition of silica sand may be added to address these concerns.

APPLY: PIP 3100 RR is installed at a rate of 85 square feet per prescribed mix using a screed box or rake. Power trowel the wet mortar to compact, densify, level and smooth the material. Care should be taken not to over-trowel to avoid friction blisters.

COATING: **PIP 3100 RR** can be top coated with other Protective Industrial Polymer systems after cure. Proper recoat limitations and directions must be honored. If sanding is required, remove all sanding debris with a vacuum. If contaminated with traffic, scrub with detergent and rinse with clean water. Surface must be allowed to dry before coating.

CURING (DRYING): Allow the mortar to cure (dry) for a minimum 24 hours after application at 75°F (24°C) and 50% RH before grinding and applying the grouting resins and finishing with the final desired top coats. Only open the floor to light traffic after sufficient cure, allow more time for low temperatures and higher humidity or for heavier traffic. Full coating properties may take up to 7 days to develop.

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.
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

Technical Data Sheet

PIP 3100 RR

Resin-Rich Epoxy Mortar System

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

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.