Technical Data Sheet

PIP VE-FR Resin

Fire-Resistant Vinyl Ester System

PROTECTIVE INDUSTRIAL POLYMERS

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

DESCRIPTION:

PIP VE-FR Resin is a fire-retardant, brominated, bisphenol-A epoxy vinyl ester resin. This product provides corrosion-control to a wide variety acids and alkalis. It can be used to produce glass-reinforced laminates with excellent impact and stress resistance. **PIP VE-FR Resin** is ideal for environments that require resistance to flame spread, thermal cycling and corrosion.

Advantages

- Very good high temperature stability
- Resistant to wide variety of corrosives
- Produces durable stress-fatigue resistant laminates
- Premium brominated epoxy vinyl ester polymer
- ASTM E-84 Class A (25 flame spread) with 3% post addition of antimony pentoxide (optional).

Chemical Resistance

Information on the chemical resistance properties will be furnished on request.

Surface Preparation

Metal - For immersion or intermittent splash and spillage conditions, abrasive blast to "White Metal" in accordance with Steel Structures Painting Council Specifications **SP-5 or NACE Specification #1**. For fumes and dry environments, abrasive blast to "Near White" in accordance with **SP-10 or NACE #2**. A minimum surface profile of 3.0 mils is required.

Concrete – Abrasive blasting or scarification to remove laitance and surface contaminants is recommended. Concrete must be thoroughly cured, free of oils, curing solutions and mold release agents, dust and must be dry at time of application. Use ASTM D 4263 (plastic sheet test method) to ensure concrete is moisture free. If moisture is detected, retest until dry.

Priming- Use PIP VE-PR-Flex for or PIP VE-CR for priming. **DO NOT USE AN EPOXY PRIMER FOR PRIMING BENEATH ANY VINYL ESTER COATING.**

Mixing Ratio by Volume

VE-FR-A Resin	1 gal
VE-B Hardener	2.0-3.0 oz

Mixing

Mechanically premix **VE-FR-A** (Part A) resin for 2 minutes prior to adding hardener. After initial mixing, add 2-3 oz. of **VE-B** Hardener (Part B) per gallon of **VE-FR-A** resin and mix three additional minutes.

Depending on cure temperature and atmospheric conditions, the resin surface could remain tacky. This is caused by air inhibition. To eliminate this possibility, and always on the top coat, add 2.0 to 3.0 oz./per gallon of PIP VE-Curing Aid additive.

Application

Apply **PIP VE-FR Resin** and hardener at 10-15 mils as a neat coating with a solvent resistant 3/8" roller. Roll evenly and grid the floor according to area and thickness. (10 mils equals 160 SF/gallon) As a mat saturant, consumption is typically 60-80 mils of resin to sufficiently saturate a 1.5 oz. random stranded fiberglass mat.

Thinning

None required. DO NOT THIN.

Spray Application Equipment

Areas may be coated by roller as below or spraying. Spraying is accomplished by using the following equipment:

1. Airless Spray System (Grayco Bull Pump) with a 30-1 ratio. An airless Vari-Tip nozzle is preferred with a 0.021-0.031 tip. Use a 5/16" airless material hose.

Handling Properties Working Time

50°F (10°C)	60 min
70°F (21°C)	45 min
90°F (32°C)	20 min

Recoat

50°F (10°C)	36 hrs
70°F (21°C)	24 hrs
90°F (32°C)	8 hrs

PIP VE-FR Resin *coating must be recoated within 7 days when shaded from sunlight. If the coating is applied in sunlight (even on cloudy days) it must be recoated within 12 hours to obtain proper intercoat adhesion*.

Time to Place in Service

50°F (10°C)	72 hrs
70°F (21°C)	48 hrs
90°F (32°C)	24 hrs

Coverage

PIP VE-FR Resin

Coating applied at 10 mils= 160 ft2/gal

Coating applied at 60 mils mat saturant 26 ft2/gal

Packaging

VE-FR-A Resin (Part A) is available in 5 gallon Pail (4 gallons Volume) and 55 gallon drums (50 gallons volume). The VE-B (Part B) is available in 1 gallon bottles as well as 4 gallon pails.

Storage and Shelf Life

Store material in a cool, dry and covered location [50°-90° F (10° - 32° C)], away from fire hazards and direct sunlight. Shelf life is from date of manufacture (DOM).

@ 40-60°F (4-16°C)	6 months
@ 61-85°F (18-29°C)	3 months
@ 86+°F (30°C)	2 months

Technical and Physical Data

	Unit	Value	
Viscosity	cps	400-500	
Viscosity RVF#2 @20rpm	cps	300-500	
Gel Time	Min	30-45	
Spec. Gravity		1.12-1.17	
Flash Point (Seta Closed Cup)		90°F	
Tensile Strength	psi	11,000	ASTM D 638-02
Tensile Modulus x10^5	psi	5.2	ASTM D 638-02
Tensile Elongation	%	3.5-4.5	ASTM D 638-02
Flexural Strength	psi	22,100	ASTM D 790-02
Flexural Modulus x10^5	psi	5.2	ASTM D 790-02
Heat Deflection Temp	°C/°F	110/230	ASTM D 648

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Flame Spread (clear)	30(Class B) ASTM E 84
Flame Spread (3% Antimony Pentoxide)	25(Class A) ASTM E 84

Safety

PIP VE-FR Resin contains vinyl ester resins and cumene hydroperoxide catalyst. The product's components have been formulated to optimize physical characteristics such as filling capacity, abrasion, moisture and chemical resistance while minimizing hazardous physical and health factors encountered during application. A concerted effort is made to be aware of the latest chemical toxicological information and to apply this knowledge in a responsible manner to ensure product safety.

During application of **PIP VE-FR Resin** materials, always wear gloves and appropriate work clothing to minimize contact. Ventilation is required with special consideration for enclosed or confined areas. Air movement must be designed to insure turnover at all locations in work area and adjacent areas to avoid buildup of heavy vapors. Wear respirator when necessary. Use caution when handling flammable liquids, eliminate sources of ignition from work area and containers with residues.

Observe safe storage practices by separating resins from hardeners, by keeping solvents in a cool area, free of sources of ignitions.

Product Material Safety Data Sheets are available and should be consulted when handling products. These products are for industrial and professional use only; application directions must be followed.

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

Maintenance

Periodically inspect the applied material and repair localized areas as needed. Consult your Protective Industrial Polymers representative for additional information.

READ MATERIAL SAFETY DATA SHEET (MSDS) FOR SAFETY AND PRECAUTIONS. KEEP OUT OF REACH OF CHILDREN.

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.