Technical Data Sheet

PIP 100 ESD HB

ESD High-Build Epoxy System

PROTECTIVE INDUSTRIAL POLYMERS

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

DESCRIPTION:

PIP 100 ESD HB is a high solids, three-component, high-build epoxy resin system designed to facilitate electrostatic control. **PIP 100 ESD HB** is supplied with a blended cycloaliphatic amine curing agent that exhibits good UV and chemical resistance. This product produces a durable gloss finish.

USES:

PIP 100 ESD HB can be installed in many environments where the damaging effects of electrostatic discharge (ESD) cannot be tolerated. Primary industries that use ESD flooring include *Electronic Assembly, Data Processing, Military/Aerospace, Hazardous Industries (dust or explosion hazards).* This system is intended for application over top of a Protective Industrial Polymers insulating epoxy primer or build coat.

ADVANTAGES:

- Consistent resistance to ground without dependence on a separate ground plane primer
- Body Voltage Generation (BVG) below 15 volts with conductive footwear.
- Dissipates a 5000 volt charge to 0 volts in less than 0.1 seconds.
- Maintains ESD properties throughout the thickness of the applied coating and not dependent humidity for proper conductivity (unlike carbon fiber systems)
- Very low Odor
- High-build application, tough, seamless, non-porous surface that is easy to maintain
- Excellent impact and abrasion resistance
- Seals concrete, protecting against dirt and spills
- Resists staining as a result of major chemical spills or cleaning and the use of industrial chemicals
- Complies with VOC regulations for Industrial Maintenance Coatings in the OTC and CA.
- Meets ANSI/ESD S20.20-2021 ESD Association Standard for the Development of an Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)
  Meets or exceeds specification under the following testing methodologies under standard:
  ANSI/ESD STM7.1-2020
  ANSI/ESD STM97.1-2015
  ANSI/ESD STM97.2-2016
  ANSI/ESD S6.1-2019

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.

SHELF LIFE: Unopened containers 3 months from date of manufacture.

PACKAGING KITS/ PART NUMBERS:

PIP 100 ESD HB Pigmented Gloss Coating 3.38 gallons
100 ESD HB-A/5SF, 100 ESD HB-B/1, CPESD-xxx/P

PIP 100 ESD HB Pigmented Gloss Coating 3.50 gallons
100 ESD HB-A/5SF, 100 ESD HB-B/1, CPESD-xxx/Q

Colors

Color Pack: Color packs designated as **CPESD-xxx** are used with **PIP 100 ESD HB.** Most colors require a pint of color pack to achieve proper color. Some require a quart of color pack. Listed below are these current exceptions.

COLOR 100 Ultra-Light Gray- If desired color is 100 Ultra-Light Gray, use CPESD-100/Q color pack in the mixture of PIP 100 ESD HB. Use CPU-100 in the PIP 1000 HB epoxy primer or basecoat.

COLOR 248 Beige- If desired color is 248 Beige Gray, use CPESD-248/Q color pack in the mixture of PIP 100 ESD HB. Use CPU-248 in the PIP 1000 HB epoxy primer or basecoat.

It is important to have a color consistent floor in a similar color before application of **PIP 100 ESD HB.** Certain colors may negatively affect ESD properties. Please use approved color packs.

As the base color of 100 ESD HB-A (Part A) is gray, the color of the CPESD-xxx color pack is not necessarily indicative of the final finished product color. The color is achieved from the combination of the color pack, Part A and Part B.

LIMITATIONS:

Contamination and surface defects (fisheyes): If contaminates of oils, silicones, mold release agents and/or others are present, **PIP 100 ESD HB** may fisheye or crawl away from the surface. Surface contaminates should be removed with a suitable detergent and mechanical preparation prior to application. **PIP 100 ESD HB** ambers when exposed to high intensity lighting.

MATERIAL PROPERTIES*:

Properties	Test Method	Results
Flash Point	ASTM D3278	≥215 °F (102°C)
Volume Solids (mixed)	ASTM D2369	100 %
Mixed Viscosity	ASTM D2196	600-1200 cPs
Dry Time	ASTM D5895	Tack Free 6-8 hr Dry 12-16 hr Full Cure 7 days
VOC-Volatile Organic Compound	ASTM D3960	0 g/l clear & <50 g/L pigmented

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CURED PROPERTIES*:

Properties	Test Method	Results
Abrasion Resistance Taber CS-17, mg loss/1000 cycles/1000g mass	ASTM D4060	100 mg
Coefficient if Friction- COF James Test	ASTM D2047	0.55 0.65(w/NS-36)
Tensile Strength	ASTM D2370	12,000 psi
Adhesion to Concrete	ASTM D4541	350 psi concrete failure
Impact	ASTM D2794	80 in.lbs Direct & Reverse
Hardness (Pencil)	ASTM D3363	2H
Dry Film Thickness	at 12 mils WFT	12 mils

*Properties and results are based on laboratory testing at 72°F (22°C) %50 RH and are theoretical calculations and estimates.

CHEMICAL RESISTANCE*:

PIP 100 ESD HB	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.

Legend: **E- Excellent (Not Effected)**
G-Good (Limited Negative Effect)
F-Fair (Moderate Negative Effect)
P-Poor (Unsatisfactory)

Electrical Properties:

PIP 100 ESD HB static control flooring can be used to meet the recommendations set forth in ANSI-S20.20-2021 as well as the ignition control requirements of many codes and specifications for explosive and flammable materials.

Resistance: This product is capable of exhibiting surface resistance values in the static dissipative and *conductive ranges in accordance to values defined in test method EOS/ESD Association ESD STM S7.1-2020.

*Conductive properties may require the use of a conductive ground plane primer PIP 125 ESD WR-GP. Consult Protective Industrial polymers for specific requirements and recommendations.

Reparability: The lack of dependence on conductive fiber and ground plane primers allows this system to be repaired without sacrificing electrical performance.

Note: System must be properly grounded to a positive ground to assure proper operation and effectiveness of charge dissipating floor. To assure proper contact to floor surface, persons in area protected by ESD floor coating must wear approved quality ESD footwear.

Mechanical Spark Resistance:

This system creates an inert plastic barrier. It does not contain metallic or carbide fillers that can create an impact spark. Applied at the proper thickness over plastic aggregates, this system meets most requirements for non-sparking membrane surfaces.

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ELECTRICAL GROUNDING:
An insulating Protective Industrial Polymers primer must be installed between the concrete surface and the ESD coating system. In cases where a conductive system is desired, a coat of PIP 125 ESD WR-GP must be applied in addition to the insulative top coat. The anti-static coating system must be grounded to an earth ground to function properly. Conductive copper tape installed to the primer every 1000 sq. ft. or approved contact points under the anti-static coating must be established. The copper tape and/or contact points must be connected to the buildings electrical ground or directly to an approved earth ground. The EOS/ESD Association provides instruction for proper grounding of ESD equipment and floors. Please contact Protective Industrial Polymers Inc. for proper grounding.

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

SUBSTRATE: The substrate must be free of curing membranes, silicate surface hardener, paint, or sealer and be structurally sound. If you suspect concrete has been treated or sealed, proceed with complete removal process. Consult your PIP representative for further instruction if silicate hardeners or membranes have been utilized.

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: Testing for MVT does not guarantee against future problems. If there is no known vapor barrier or the vapor barrier is inadequate, there is an elevated risk of bond failure. Other factors including the migration of oils, chemicals, excessive salts or Alkali Silica Reaction (ASR) from the concrete from may also elevate the risk of adhesion difficulties. Consult your PIP representative for approved mitigation treatments.

TEMPERATURE AND HUMIDITY: During the application and cure of the coating, the substrate temperature, material temperature and room conditions must be maintained between 65°F (18°C) and 80°F (27°C). Relative Humidity (RH) should be limited to 30-60%. DO NOT apply coatings unless the surface 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)**
- **Jiffy® Mixer Blade model ES**
- **Clean container for mixing material**
- **Low speed high torque drill motor**
- **High quality short nap roller covers- ¼ inch nap**
- **Application Squeegee**

PREPARATION:
Surface dirt, grease, oil and contaminates must be removed by detergent scrubbing and rinsing with clean (clear) water.

Mechanical Preparation: Blasting or grinding the surface is the preferred method of preparation. The success of industrial diamond grinding as a concrete preparation method will vary depending on technique and the hardness of the concrete.

APPLICATION:

MIXING: Premix all components at slow speed prior to mixing together. Use a **Jiffy® ES** mix blade attach to a slow speed drill. Mix only enough material at one time not to exceed the pot life.
COLORS: Premix designated color pack **CPESD-xxx .** The color pack should be added prior to adding the Part B curing agent.

MIX: Pre-mix Part A for 3 to 4 minutes. Add color pack and mix for 1 to 2 minutes or until color is uniform throughout the pail.
Add Part B while mixing and mix an additional 2 minutes.

APPLY* PIP 100 ESD HB*: at a rate of 12-20 mils to the floor surface using a notched squeegee. Back roll the wet coating using a ¼ inch nap mohair roller. Care should be taken to overlap and cross lap, but not over roll the coating introducing air to the surface.

SPREADING RATE: Too little material may produce inconsistent or non-compliant electrical properties. The best practice is to measure and grid the floor to be sure of proper application rate and performance.
CURING (DRYING): Allow the coating to cure (dry) for a minimum 24 hours after application at 75°F (24°C) and 50% RH before opening the floor to light traffic, allow more time for low temperatures and higher humidity or for heavier traffic. Full coating properties may take up to 7 days to develop.

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. Consult Protective Industrial Polymers for proper treatment of moving joints.

***RECOAT:* PIP 100 ESD HB** can be top coated with other Protective "ESD" epoxy coatings or may be used as a topcoat over existing (sound) epoxy coatings. Contact your PIP representative for instructions, testing and approval prior to top coating.

***BARE CONCRETE APPLICATION:* PIP 100 ESD HB** MUST BE APPLIED OVER A PIP EPOXY PRIMER to seal and insulate the anti-static topcoat from erratic conductivity in the concrete. Use either PIP 1000 CR or PIP 1200 WR.

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

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.

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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.

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

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.

ESD-CONTROL COATING WARRANTY ADDENDUM: The properly installed ESD coating will retain static control properties for a period of five years from the date of installation under normal and ordinary wear conditions. This warranty is null and void if the ESD-control coating are no longer intact or said coating has been coated with waxes, finishes or other coatings. This warranty will be null and void in any area where the ESD control coating has been damaged. PIP will, under this limited warranty, provide replacement material for reinstallation of the ESD coating System. In no event shall PIP be liable for any consequential damages or additional cost and shall only be responsible for the cost of the material. Any original or replacement coatings must be installed by PIP or a recognized PIP installer. **This warranty only applies to materials paid for in full.** No other representations or ESD related warranties are made with respect to said product.

WARRANTY AND CONDITIONS OF USAGE