

# PIP 200 ESD Conductive UR

## Low Odor, High Solids ESD Conductive Urethane System



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

### DESCRIPTION:

**PIP 200 ESD Conductive UR** is a very low odor, three-component, chemical-resistant, aliphatic polyester ESD urethane coating designed to develop electrostatic control properties. **PIP 200 ESD Conductive UR** produces a non-yellowing, thin-film, semi-gloss to satin finish and is available in a variety of colors and textures. **PIP 200 ESD Conductive UR is designed to impart electrical resistance readings below 1 million ohms when tested in accordance to ANSI/ESD S7.1 and ASTM F-150 test methods.**

### USES:

**PIP 200 ESD Conductive UR** can be installed in a number of different 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)*. It is suited for applications over top of an insulative epoxy primer or build coat.

### ADVANTAGES:

- Extremely low, non offensive odor
- Wide selection of colors available including near white and bright blues
- Can be used on decorative flake and quartz floors as a transparent ESD top coat without addition of the color pack.
- Variable Texture, skid resistance, and abrasion resistance can be achieved by addition of GlossGrip and DiamondWear additives
- Consistent resistance to ground without the need of a ground plane primer utilizing conductive particulates and polymers
- BODY VOLTAGE GENERATION (BVG) below 15 volts with conductive footwear
- Meets ANSI/ESD S20.20-2014 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 STM7.1-2013  
ANSI/ESD STM97.1-2015  
ANSI/ESD STM97.2-2016  
ANSI/ESD S6.1-2014  
DOD 4145.26M Section C6.4.7.5.1.
- **Electrical resistance readings below 1 million ohms when tested in accordance to ANSI/ESD S7.1 and ASTM F-150 test methods.**
- 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)
- Superior 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.

**Electrical Properties:** *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.

**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:** 3 months from date of manufacture (un-opened)

### PACKAGING KITS/ PART NUMBERS:

**PIP 200 ESD Conductive UR Pigmented Coating 1.80 gallons**  
ESD-200C-A/2SF, ESD-200-B/1, CPU-xxx/HP or CPU-XXX/P

### Colors:

0 VOC Color packs designated as **CPU-xxx** are used with **PIP 200 ESD Conductive UR**. Most colors require a half pint of color pack to achieve proper color. Some require a full pint of color pack. Listed below are these current exceptions.

**COLOR 100 Ultra-Light Gray-** If desired color is 100 Ultra-Light Gray, use CPU-9010/P color pack in the mixture of **PIP 200 ESD Conductive UR**. Use CPU-100 in the PIP 1000 HB epoxy primer or basecoat.

**COLOR 101 White Gray-** If desired color is 101 White Gray, use CPU-101/P color pack in the mixture of **PIP 200 ESD Conductive UR**. Use CPU-101 in the PIP 1000 HB epoxy primer or basecoat.

**COLOR 248 Beige-** If desired color is 248 Beige Gray, use CPU-248/P color pack in the mixture of **PIP 200 ESD Conductive UR**. 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 200 ESD Conductive UR**. Certain colors may negatively affect ESD properties. Please use approved color packs.

As the base color of ESD-200C-A (Part A) is gray, the color of the CPU-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.

*Traction/Appearance:* Approved quantities of GlossGrip bead can be incorporated with **PIP 200 ESD Conductive UR** to offer increased traction and abrasion resistance of the coating.

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### LIMITATIONS:

*Contamination and surface defects (fisheyes):* If contaminants of oils, silicones, mold release agents and/or others are present, **PIP 200 ESD Conductive UR** may fisheye or crawl away from the surface. Surface contaminants should be removed with a suitable detergent prior to application. Solvent cleaning of silicone contaminants may make the situation worse; please contact the lab for additional recommendations.

Bright and brilliant colors which are achieved by the use of organic pigments such as bright shades of green, blue, yellow and red may require special circumstance which may include two applications of **PIP 200 ESD Conductive UR**. Each circumstance must be considered separately and reviewed by Protective Industrial Polymers.

**PIP 200 ESD Conductive UR** should not be applied directly to PIP 1800 Flex. PIP 1800 Flex reduces conductivity and increases resistance readings above 1M ohms. Consult Protective Industrial Polymers for additional information.

### MATERIAL PROPERTIES\*:

Properties	Test Method	Results
Flash Point	ASTM D3278	187 °F (86°C)
Volume Solids (mixed)	ASTM D2369	75%
Mixed Viscosity	ASTM D2196	300-500 cPs
Dry Time	ASTM D5895	Tack Free 8 hr Dry 16-24 hr Full Cure 7-14 days
VOC-Volatile Organic Compound	ASTM D3960	< 250 g/l Pigmented

### CURED PROPERTIES\*:

Properties	Test Method	Results
Abrasion Resistance Tabor CS-17, mg loss/1000 cycles/1000g mass	ASTM D4060	25 mg
Coefficient of Friction- COF James Test	ASTM D2047	0.55 0.65(w/GLOSS GRIP)
Elongation	ASTM D2370	8%
Impact	ASTM D2794	140 in.lbs Direct & Reverse
Hardness (Pencil)	ASTM D3363	2H
Dry Film Thickness	at 3.5 mils WFT	3.2 mils

\*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 200 ESD Conductive UR	1 Day	7 Days
<b>ACIDS, INORGANIC</b>		
10% Hydrochloric	G	G
30% Hydrochloric	G	F
10% Nitric	G	F
50% Phosphoric	G	F
37% Sulfuric	F	P
<b>ACIDS, ORGANIC</b>		
10% Acetic	G	F
10 % Citric	G	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	G	G
Methanol	P	P
d-Limonene	E	E
Jet Fuel	E	E
Gasoline	E	E
Mineral Spirits	E	E
Xylene	E	E
Methylene Chloride	P	P
MEK	G	G
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)  
G-Good (Limited Negative Effect)  
F-Fair (Moderate Negative Effect)  
P-Poor (Unsatisfactory)

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Issue/Rev Date: 11-07-2019

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### ELECTRICAL GROUNDING:

Installing an insulated primer between the concrete surface and anti-static coating is mandatory. The anti-static coating must be grounded to an earth ground every 1000 square feet to be compliant. The EOS/ESD Association provides instruction for proper grounding of ESD equipment and floors. Contact Protective Industrial Polymers for proper grounding technique and product certification.

### 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 (26°C). Relative Humidity (RH) should be limited to 30-70%. 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 lint free roller covers- 3/8 inch nap
- Application Squeegee (for smooth finish without Gloss Grip)

### PREPARATION:

Surface dirt, grease, oil and contaminants 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.

**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 200 ESD Conductive UR can be top coated with itself or may be used as a final topcoat over existing (sound) epoxy ESD coatings. The prior cured coating surface must be sanded with 100 grit sand paper or sanding screen if recoat windows are exceeded. Sand to a uniform dulled surface. Remove all sanding debris with a vacuum or damp mop. Surface must be dry and completely dust free before coating.

### PRIMER APPLICATION:

PIP 200 ESD Conductive UR MUST BE APPLIED OVER AN APPROVED INSULATING PRIMER (OR SURFACE) to seal and insulate the anti-static topcoat from stray conductivity in the concrete. Use either PIP 1000 CR, PIP 1000 HB or PIP 1200 WR as the epoxy primer (See appropriate product data sheet for application instructions).

**MIXING:** It is critical to get the entire contents mixed correctly. It is likely that the contents of the Part A, ESD-200C-A/2SF has settled in the bottom of the pail. At times the settle can be quite hard. To achieve the correct mix:

1. First pour the free layer of top liquids into a clean 5-gallon mix pail.
2. Then use a putty knife or margin trowel to cut through and lift the settled material from the bottom of the pail and transfer to the 5-gallon pail.
3. With a jiffy mix paddle attached to a variable speed drill, first slowly mix the transferred material into a homogenous mixture free of lumps and separated liquid.
4. Increase the speed of the mix paddle as more of the settled material is dissolved into the liquid. (Starting the mix paddle at high speed will likely splash the free liquid out of the pail and alter the final mix.)
5. Once mixture is homogenous, add the color pack and mix for 1 minute or until the color is uniform throughout.
6. Lastly, add the Part B ESD-200-B/1 and mix for an additional 2 minutes at medium speed.
7. It is strongly recommended to filter the entire mix with a nylon mesh paint strainer into another 5-gallon pail to remove agglomerates of particulate that may have not gotten thoroughly mixed.
8. If the addition of GlossGrip or DiamondWear is prescribed, add these aggregates ONLY AFTER the entire mix is filtered as in step 7. Filtering will just remove these aggregates.

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### APPLICATION:

**APPLY PIP 200 ESD Conductive UR:** at a rate of 3.5-4 (824-721 SF/1.8 GAL kit) to the floor surface using a notched squeegee. If Gloss Grip or Diamond Wear aggregate is utilized, PIP 200 ESD Conductive UR must be pan rolled and NOT squeegeed. Using a squeegee will produce lines of aggregate that will not roll out evenly. Back roll the wet coating using a 3/8 inch nap roller. Care should be taken to overlap and cross lap. One coat of **PIP 200 ESD Conductive UR** is all that is required to achieve desired ESD properties. It is important to maintain 4 mils as the maximum thickness. Thicker applications may result in higher resistance readings above 1 million ohms.

Be sure to sufficiently roll out the **PIP 200 ESD Conductive UR** to achieve an even film thickness throughout the entire project. Excessively thick areas (> 4 mils) will exhibit slightly more gloss whereas thinner areas (<3 mils) will tend to be flatter in sheen. **PIP 200 ESD Conductive UR**, unlike most other urethane coatings, will not foam from rolling leaving bubbles. Material must be rolled enough so that the reflection is uniform showing little to no sign of lap marks, puddles or thick and thin areas.

**WORKING TIME** – Material must be mixed applied and finish rolled within 20 minutes of mixing. Failure to achieve this may result in inconsistent or non compliant electrical performance and also provide an inconsistent finish. Do not combine multiple kits together unless this time table can be easily met.

**SPREADING RATE:** Material applied too heavy may blister or can be soft during curing. Too little material may produce a non-uniform look and affect electrical performance. The best practice is to measure and grid the floor to be sure of proper application rate.

**CURING (DRYING):** Allow the coating to cure (dry) for a minimum 18 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 lower 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.

### 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.

**READ SDS (SAFETY DATA SHEET) FOR SAFETY AND PRECAUTIONS. USE PRODUCT AS DIRECTED. FOR INDUSTRIAL USE ONLY. 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, NEGLIGENCE 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

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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.