

This specification covers **HangarSpec CR-ESD** Chemical-Resistant ESD-Control System. A five coat high-build ESD-Control coating system utilizing a moisture-tolerant primer, high solids epoxy base coat(s), and top coat(s) with a high-performance aliphatic polyester ESD-Control urethane. This system exhibits excellent chemical resistance and is ideal for aircraft instrument production areas, or any other areas which require protection from static electricity combined with chemical-resistance.

## **1.00 GENERAL**

### **1.01 SECTION INCLUDES**

- A. Preparation of cast-in-place concrete slab.
- B. Apply moisture-tolerant epoxy primer
- C. Apply high-build epoxy basecoat
- D. Apply 2nd high-build epoxy basecoat
- E. Two applications of ESD-Control urethane topcoat

**Specifier Notes:** Edit the following list as required by the project. List other sections with work directly related to the floor coating.

### **1.02 RELATED SECTIONS**

- A. Section 03 30 00 – Cast-In-Place Concrete: [existing or] new slab.
- B. Section 03 35 00 – Concrete Finishing: specific chemicals on slab.
- C. Section 03 39 00 - Concrete Curing
- D. Section 03 01 00 – Concrete Rehabilitation

### **1.04 REFERENCES STANDARDS**

- A. For reference standards tests & results refer to Manufactures Product Data Sheets

### **1.05 ADMINISTRATIVE REQUIRMENTS**

- A. Pre installation meeting call if needed.
- B. Involve: Owner, Contractor, Consultant(s), sub-contractors effected

### **1.06 SUBMITTALS**

- A. Samples: forward 4- 4" x 4" color samples representative of finish product for review.
- B. Manufactures' Instructions: submit to Consultant for review.
- C. Sustainable Design Submittals: as required by other sections.

### **1.07 CLOSEOUT SUBMITTALS**

- A. Applicable testing/performance data certification(s)
- B. Certification(s) of compliance with owner's performance spec, if required
- C. Cleaning, care and maintenance instructions
- D. Material warranty information

### **1.08 QUALITY ASSURANCE**

- A. Regulatory Agency Sustainability Approvals
- B. Applicator: Use applicator experienced in application of specified materials for a minimum of [5] [Five] years on projects of similar size and complexity. Provide list of completed projects including project name and location, name of architect, name of material manufacturer, and approximate quantity of materials applied.
- C. Applicator's Personnel: Employ only persons trained for application of specified materials.

### **1.09 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, batch or lot number, and date of manufacture. Do not store in direct sunlight or high heat conditions.
- B. Packaging Waste Management
- C. Storage:
  - 1. Store materials in accordance with manufacturer's instructions.
  - 2. Keep containers sealed until ready for use.
  - 3. Do not subject material to excessive heat or freezing; do not apply material that has been subjected to excessive heat or freezing. Material subjected to excessive heat or freezing shall be separated from inventory and destroyed by mixing all three components. The solid reacted product shall be disposed of in environmentally sound and regulatory compliant manner.
  - 4. Shelf life:
    - 1. ESD top coat -3months after date of manufacture, in unopened containers, under normal conditions.
    - 2. Primer and Basecoat- 1 year after date of manufacture, in unopened containers, under normal conditions.
- D. Handling: Protect materials during handling and application to prevent damage or contamination.
- E. Condition materials for use to 65°F – 75°F (18°C - 24°C) for 24 hours prior to application.

### **1.11 SITE CONDITIONS**

- A. Ambient Conditions
  - 1. Do not apply materials if floor or air temperature is below 65°F (18°C).
  - 2. Do not apply materials if relative humidity is above 85 percent or within 5° of dew point at time of application.
- B. Existing Conditions
  - 1. Utilities, including electric, water, heat and finished lighting to be supplied by General Contractor.
  - 2. Maintain room temperature between 65°F – 75°F (18°C - 24°C) for 48 hours before, during and 48 hours after installation, or until cured.

3. At the time of application ensure the minimum substrate temperature is above 60°F (15°C) and the substrate temperature is 5°F (3°C) above the measured dew point at the time of application.
4. Erect suitable barriers and post legible signs at points of entry to prevent traffic and trades from entering the work area during application and cure period of the floor.
5. Protection of finished floor from damage by subsequent trades shall be the responsibility of the General Contractor.

#### **1.12 MANUFACTURER WARRANTY**

- A. Provide warranty covering materials for a period of [1] [one] year after date of installation
- B. Installer to provide suitable warranty covering workmanship

### **2.00 PRODUCTS**

#### **2.01 MANUFACTURER**

- A. Protective Industrial Polymers [www.protectpoly.com](http://www.protectpoly.com) (866) 361-3331
- B. 7875 Bliss Parkway, North Ridgeville, Ohio 44039

#### **2.02 MATERIALS**

- A. Protect 1200 WR waterbased Epoxy Primer
- B. Protect 1000 HB Epoxy Basecoat
- C. Protect 200 ESD UR ESD-Control Urethane Topcoat

#### **2.03 QUALITY CONTROL**

- A. Tests and Inspections: as required by Manufacturer.
- B. Non-Conforming Work: remove immediately and dispose off site.
- C. Coordination of Other Tests and Inspections

### **3.00 EXECUTION**

#### **3.01 APPLICATOR**

- A. Must be a recognized contractor of Protective Industrial Polymers

#### **3.02 EXAMINATION**

- A. Substrate:
  1. Free of curing membranes, silicate surface hardener, paint, or sealer and be structurally sound.
  2. If you suspect concrete has been treated or sealed, proceed with complete removal process.
  3. Consult your PIP representative for further instruction if silicate hardeners or membranes have been utilized.
- B. Moisture:

1. The relative humidity of the concrete substrate shall be less than 75% (using ASTM F2170).
- C. Vapor / Contamination:
1. Testing for MVT does not guarantee against future problems.
  2. If there is no known vapor barrier or the vapor barrier is inadequate, there is an elevated risk of bond failure.
  3. 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.
  - .4 Consult your PIP representative or refer to specifications for approved moisture mitigation treatments.
    - .1 [Protect VM-CS](#)
    - .2 [Protect 1300 MVR](#)
    - .3 [Protect UC](#)
- D. Temperature:
1. During the application and cure of the coating, the substrate temperature, material temperature and room conditions must be maintained between 18°C (65°F) and 32°C (90°F).
- E. Humidity:
1. Relative Humidity (RH) should be limited to 30-80%.
  2. DO NOT apply coatings unless the surface temperature is more than five degree over the dew point.

### **3.03 PREPARATION**

- A. Remove surface dirt, grease, oil, and contaminates by detergent scrubbing and rinse with clean (clear) water.
- B. Mechanical Preparation: Blasting or grinding the surface is the preferred method of preparation.
- C. The success of industrial diamond grinding as a concrete preparation method will vary depending on technique and the hardness of the concrete.

### **3.04 JOINTS**

- A. All non moving joints (control joints) may be filled with a semi-rigid joint compound such as Protect JF-Epoxy or Protect JF-Polyurea. These joints may be coated with the ESD top coat to maintain electrical continuity across the joint.
- B. Isolation or expansion joints must be either:
  1. Coated with ESD top coat providing electrical continuity across the joint. Cracks may form in the ESD top coat intermittently throughout the length of the joint partially breaking some of the electrical continuity. Electrical continuity will not be interrupted unless the crack runs throughout the entire length of the joint totally separating the two adjacent slabs. If desired, grounding can be achieved using methods .2 and .3 below.
  2. Strapped topically with a conductive metallic grounding strap or copper tape containing a conductive adhesive after the ESD top coat is applied. This

type of grounding must be kept in a location where there is minimal to no traffic which could possibly break this bridged grounding strap.

3. Strapped through the joint by running a U- shaped piece of copper tape containing a conductive adhesive or conductive metallic strap down through the joint and back up the other side prior to filling the joint with flexible joint filler. The tabs of the U-shaped grounding piece extend at least 1 inch out into the slab on either side of the joint. The tabs must not be coated with the insulative primer and basecoat remaining bare to receive the ESD top coat only. The ESD topcoat is then applied to each slab and electrical continuity is maintained through the U-shaped grounding piece. This method is used when anticipating very large movement in the joint where a coating is not expected to stay bonded permanently to the joint material.

### **3.05 MIXING**

- A. Mix material in appropriate vessel as stated in the product's corresponding Technical Data Sheet.
- B. Mix material as directed in the product's corresponding Technical Data Sheet.

### **3.06 APPLICATION EQUIPMENT**

- A. Protective equipment and clothing as called for in the MSDS
- B. Jiffy® Mixer Blade model ES
- C. Clean container for mixing material
- D. Low speed high torque drill motor
- E. High quality short nap roller covers - ¼ - 3/8 inch nap
- F. Application squeegee
- G. Roller Pans

### **3.07 APPLICATION**

- A. Protect 1200 WR Waterbased Epoxy Primer
  1. Apply the properly mixed material to the substrate using a notched or flat squeegee and level uniformly with a non shed 3/8" roller.
- B. Protect 1000-HB Base Coat
  1. Apply the properly mixed basecoat to the primed substrate using a notched squeegee and level uniformly with a non shed 3/8" roller.
- C. Protect 1000-HB Base Coat
  1. Apply the properly mixed basecoat to the primed substrate using a notched squeegee and level uniformly with a non shed 3/8" roller.
  2. Leaving the material sit in the pail longer than 10 minutes will result in an increase of viscosity and reduce leveling properties.
- D. Protect 200 ESD UR Top Coat
  1. Apply the properly mixed ESD topcoat to the basecoat only by pan-rolling using a pan and non shed 3/8" roller.
  2. Leaving the material sit in the pan longer than 10 minutes will result in an increase of viscosity, reduce leveling properties and diminish electrical conductivity.

3. A second application is applied when first coat is cured sufficiently.

E. Tolerances:

1. HangarSpec CR-ESD: 35-45mils

### **3.08 SPEADING RATE**

- A. Primer - the degree of porosity in the concrete will greatly affect coverage rates.  
Typical consumption rates for primer application are 6-8 mils, (200-267 SF/gal).
- B. Basecoat – is applied at 10-15 mils (107-160 SF/gal) per coat.
  - 1. The best practice is to measure and grid the floor to be sure of consistent application rate.
- C. ESD Epoxy Top Coat:
  - 1. Protect 200 ESD UR is applied at 4 mils (400 SF/gal) per coat.

### **3.09 CURING**

- A. Allow the coating to cure (dry) for a minimum 24 hours after application at 24°C (75°F) and 50% RH before opening the floor to light traffic, allow more time for low temperatures and higher humidity or for heavier traffic.
- B. Full coating properties may take up to 7 days to develop.

### **3.10 REPAIR**

- A. Repair gouges, chip outs, and scratches as soon as possible to prevent moisture and chemical under cutting and permanent damage to the floor coating.

### **3.11 RECOAT**

- A. Refer to appropriate product's Technical Data Sheet for recoat timetables and allowable recoat parameters as presented by the manufacturer.
- B. If the re-coat window has expired, the prior cured coating surface must be sanded with 100 grit sand paper or sanding screen installed on a swing-type floor buffer.
- C. Sand to a uniform dulled surface.
- D. Remove all sanding debris with a vacuum and damp mop.
- E. Scrub with detergent and rinse with clean (clear) water.
- F. Surface must be dry before recoating.

### **3.12 SITE QUALITY CONTROL**

- A. Site Tests and Inspections: per manufacturer's guidelines
- B. Non-Conforming Work: remove immediately and dispose off site

### **3.13 ADJUSTING**

- A. Permitted only upon manufacturer's approval in writing

### **3.14 CLEANING**

- A. Remove masking, draping, and other protection from adjacent surfaces.
- B. Remove remaining materials and debris from job site and dispose of them according with local rules and regulations. Leave area in clean condition free of debris.

### **3.15 CLOSEOUT ACTIVITIES**

- A. Notify manufacturer of completion of installation
- B. Forward operation and maintenance data to owner/owner's rep
- C. Forward effective warranty date and information to owner/owner's rep

### **3.16 PROTECTION**

- A. Pointed items or heavy items dropped on the floor may cause chipping or concrete pop out damage.
- B. Plasticizer migration from rubber tires can permanently stain the floor coating.
- C. 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.
- D. Rubber burns from quick stops and starts from lift trucks can heat the coating to its softening point causing permanent damage and marking.

### **3.17 MAINTENANCE**

- A. Allow floor coating to cure at least one week before cleaning by mechanical means (IE: sweeper, scrubber, disc buffer).
- B. 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.
- C. Regularly sweep to avoid ground in dirt and grit which can quickly dull the finish, decreasing the life of the coating.
- D. Spills should be removed quickly as certain chemicals may stain and can permanently damage the finish.
- E. 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.
- F. Heavy objects dragged across the surface will scratch all floor coatings. Avoid gouging or scratching the surface.

### **END OF SECTION**

*See additional legal information below*

Protective Industrial Polymers may change individual product properties without notice. All sales subject to Protective Industrial Polymers' current terms and conditions of sale. Current terms and conditions can be obtained by calling 866-361-3331. The user of the Protective Industrial Polymers' product(s) must test the product(s) for suitability for the intended purpose and application before proceeding with full application of the product(s).

The most current Technical Data Sheets, System Sheets and SDS information are available at [www.protectpoly.com](http://www.protectpoly.com), or by calling 866-361-3331. Installers and handlers of any Protective Industrial Polymers material must read and follow all printed information on Product Labels, Technical Data Sheets, System Data Sheets and SDS Sheets. Nothing contained in any Protective Industrial Polymers material relieves the installer, handler, owner or owner's rep of the obligation to read and follow stated warnings and instructions as presented in these referenced documents.

All information provided by Protective Industrial Polymers concerning its products, including but not limited to, advice and recommendations relating to the application and use of Protective Industrial Polymers products, is provided in good faith based on Protective Industrial Polymers' knowledge of its products when properly transported, stored, handled and applied under normal conditions in accordance with Protective Industrial Polymers' written instructions. With regard to field practice, the differences in materials, substrates, storage and handling conditions, actual site conditions and other factors outside of Protective Industrial Polymers' control are such that Protective Industrial Polymers assumes no liability for the provision of such information, advice, recommendations or instructions related to its products, nor shall any legal relationship be created by or arise from the provision of such information, advice, recommendations or instructions related to its products.