



**SPI**  
**COATINGS**  
PROVEN PERFORMANCE • REAL WORLD SOLUTIONS

## SPI Coating System Application Procedures

### Super Therm<sup>®</sup> and Enamo Grip



## Insulation Protection System for Passenger Boarding Bridge

### Prepared for McCarran International Airport

(Rev 1 - 10/09/18)

#### PART 1 - GENERAL

##### 1.1 Related Documents.

- A. Technical Data Sheets, Application Instructions, and Safety Data Sheets apply to this Section.

##### 1.2 Summary.

- A. This specification covers the description of the insulation system and the preparation of surfaces and application procedures for coating of an existing passenger boarding bridge for McCarran International Airport ("MIA") to provide insulation protection using Super Therm<sup>®</sup> and Enamo Grip.

##### 1.3 System Description.

- A. Insulation Protection: Super Therm<sup>®</sup> is a water-borne system using high-performance aliphatic urethanes, elastomeric acrylics, and resin additives that produce a tough, flexible coating film. Designed for performance and durability, Super Therm<sup>®</sup> contains four (4) unique ceramics to block up to 95% of solar heat load from visual light, ultra violet, and infrared wavelengths. Super Therm<sup>®</sup> is a flexible membrane with low permeability that can greatly reduce expansion and contraction of metal by eliminating thermal shock and that can prevent corrosion and surface deterioration.
- B. Surface Protection and Cleanliness: Enamo Grip is a two-part aliphatic polyurethane enamel coating system that forms a uniquely hard and durable coating film. Enamo Grip is resistant to water and humidity, stains, acids, solvents, and chemicals as well as having tremendous scuff, mar, and impact resistance. Enamo Grip can be used as a topcoat for Super Therm<sup>®</sup> to provide an extra layer of protection and slickness for appearance and cleanability.

##### 1.4 Submittals.

- A. Performance Data Requirements for Super Therm<sup>®</sup>.
  - 1. Applied at a dry film thickness of no more than 10 to 11 mils (250 to 280 microns) to achieve the performance results of blocking radiational heat load and the ASTM test results described below.
  - 2. American Society of Testing and Materials (ASTM).
    - a. ASTM B-117 / D-1654; Salt Spray (Fog); Results; Passed 450 Hours.

- b. ASTM C-411; High-Temperature Surface Performance; Results; no warping, cracking, de-lamination, or color change.
- c. ASTM C-1371; Emissivity; Results; 0.91%.
- d. ASTM C-1371; Reflectivity; Results; 0.85%.
- e. JIS (Japanese Institute of Standards) A 5759 Reflectivity of Light and Radiation for Short Wave (Visual) and Long Wave (Infrared). Short Wave block – 92.2% and Long Wave block – 99.5%.
- f. ASTM D-412; Tensile Strength; Results; 444 psi.
- g. ASTM D-522; Mandrel Bend; Results; 1” (25mm) bend, ¼” (6mm) bend.
- h. ASTM D-1653; Water Vapor Permeability; Results; Passed.
- i. ASTM D 3273-82T / D 3274; Fungal Resistance; Results; Passed.
- j. ASTM D-4060; Abrasion Resistance (Taber test); Results; 0.06g.
- k. ASTM D-6904; Resistance to Wind Driven Rain for Exterior Coatings (Fed Spec TT-C-555B).
- l. ASTM D-7088; Resistance to Hydrostatic Pressure for Coatings (Fed Spec TT-C-555B).
- m. ASTM E-84 (NFPA 255); Flame Spread / Smoke Developed; Results; Class “A” Rating.
- n. ASTM E 84-89; Flame Spread / Smoke Developed; Results; Flame Index “0”, Smoke Index “0”.
- o. ASTM E 108 Flame Spread over Pitch Roof Structure.
- p. ASTM E-96; Water Vapor Transmission; Results; Less than .01, Perms 8.8.
- q. ASTM E 903-96 Spectral Reflectance 80% - only 0.6% loss in performance over three years in field.
- r. ASTM G 53 1000 hours UV exposure.
- s. ASTM C 236-89(93) Thermal Transmittance/Conductance (Fiberglass board having 0.52 conductance (BTU/square foot/hour/F) SUPER THERM at 10 mil dry having 0.31 (BTU/square foot/hour/F) and one coat of both sides of wall, each coat at 10 dry mils having 0.21(BTU/square foot/hour/F).
- t. ASTM E1269 Heat Capacity by Differential Scanning Colorimeter.
- u. ASTM E 1461(92) Thermal Diffusivity/Conductivity by Flash Method Std BTU flow through metal plate being 367.20 reduced with one coat of SUPER THERM to 3.99.
- v. China Center for Technical Testing:
  - (i) GB/T 1771-91 Resistance to Salt Fog (2000 hrs.) – passed.
  - (ii) GB/T 1866-88 Manual Aging (2000 hrs.) – passed.
  - (iii) GB/T 10834-88 Resistance to Salt Water (1000 hrs.) – passed.
  - (iv) GB/T 5219-85 Adhesion (Pulling Apart Method) – passed.
  - (v) GB/T 1733-93 Boiling Water Immersion (8 hrs.) – passed.
- w. International Maritime Association: IMO A.653.(16) Flame Spread Test passed for Bulkhead, wall and ceiling linings.
- x. NASA (National Aeronautic and Space Administration) NASA 8060.1 B/C Flammability Test – passed , Class A with “0” flame spread.
- y. NASA 8060.1C Toxic Off-gassing Test “K” rating for “0” off gassing.
- z. ABS (American Bureau of Shipping) testing, IMO (International Maritime Org) and US COAST GUARD APPROVAL.
  - (i) MSC 41, Smoke Toxicity – passed.

aa. ASTM D 4541 Standard Method for Pull-off Strength.

B. Performance Data Requirements for Enamo Grip.

1. Applied at a dry film thickness of no more than 4 mils (100 microns) to achieve the performance results of hard and durable coating film and the test results and certifications described below.
2. American Society of Testing and Materials (ASTM).
  - a. ASTM E-84 (NFPA 255); Flame Spread / Smoke Developed; Results; Class "A" Rating.
  - b. ASTM D-7088; Resistance to Hydrostatic Pressure for Coatings (Fed Spec TT-C-555B).
  - c. ASTM D-6904; Resistance to Wind Driven Rain for Exterior Coatings (Fed Spec TT-C-555B).
  - d. ASTM D-4060; Abrasion Resistance (Taber test); Results 11.8 mg
  - e. ASTM E-96 Permeability-0.6809 perms.
2. ABS (American Bureau of Shipping) testing, IMO (International Maritime Org) and US COAST GUARD APPROVAL.
  - a. MSC 41, Smoke Toxicity – passed.
3. ABS (American bureau of Shipping) testing and approval
4. IMO (International Marine Organization) tested and approved
  - a. IMO A. 653 (16) Flame Spread
5. Maximum Temperature Exposure Test:
  - a. Thermal analysis testing was performed on ENAMO GRIP to determine maximum temperature exposure during operation. Maximum temperature is 360 degrees F (182 C).

Note: Some tests run in triplicate. Above values may show averaged results.

C. Manufacturer's current product technical data sheet which includes the following information:

1. Generic type of coating.
2. Performance data with certified test reports.
3. Recommended dry film thickness.

1.5 Delivery, Handling, Storage, and Safety.

- A. All materials delivered to job-site shall be in original sealed and labeled containers of Superior Products International II, Inc. ("SPI"), the coating manufacturer.
- B. All coatings shall be stored in facilities designed for the purpose of coating storage and mixing. Storage areas shall be located away from open flames, be well ventilated, and be capable of maintaining ambient storage temperature as recommended by SPI.
- C. Coatings, reducing agents, and other solvents must be stored in original containers until opened. If not re-sealable, then they must be transferred to UL approved safety containers.
- D. Provide proper ventilation, personal protection, and fire protection for storage before, during, and after application.

1.6 Environmental Requirements.

- A. Coatings shall be applied in an enclosed area or during good weather.

- B. Surface temperature shall be a minimum of 40 degrees F and 5 degrees F above dew point.
- C. Coating shall have no exposure to freezing temperatures after application {day or night) until fully cured. Applicator must consider temperature and wind-chill factor.
- D. Air and surface temperatures shall be within limits prescribed by SPI for the coating being applied and work areas shall be reasonably free of airborne dust at the time of application and while coating is drying.

## **PART 2 - PRODUCTS**

### **2.1 Manufacturers.**

- A. Acceptable Manufacturer: Superior Products International II, Inc., 10835 W. 78<sup>th</sup> Street, Shawnee, KS 66214; Tel: 913-962-4848; Email: [sales@spicoatings.com](mailto:sales@spicoatings.com); Web: [www.spicoatings.com](http://www.spicoatings.com).
- B. Substitutions: Not permitted.
- C. Requests for substitutions must be made thirty (30) days prior to submittal and contain the full name of each product, descriptive literature, testing data collected from industry consensus standard testing, data on past performance, manufacturer's instruction for use and generic type. Information must demonstrate equivalence of product and performance to the specified material and complete systems. Substitutions which decrease the film thickness, the number of coats applied, change the type of coating or fail to meet the performance criteria of the specified materials will not be approved. All substitutions must be equal to or better than the specified materials and must be furnished by the same manufacturer to ensure compatibility. No coating material may be procured or delivered to the project site prior to the review and acceptance of the proposed materials by MIA in writing.

### **2.2 Materials.**

- A. Super Therm®.
  - 1. Super Therm® may be applied by soft bristle brush, three quarter inch (3/4") nap roller, or airless spray.
  - 2. Recommended spray equipment is a standard airless sprayer (2 gallons/minute at 3,300 psi) with carbon steel or titanium tip sized between .029-.033 tip size.
- B. Enamo Grip.
  - 1. Enamo Grip may be applied by soft bristle brush, one quarter inch (1/4") nap roller made for solvent use, or airless spray.
  - 2. Recommended spray equipment is a standard airless sprayer (1.5 gallons/minute at 3,300 psi) with carbon steel or titanium tip sized between .011-.015 tip.

### **2.3 Applicators/Contractors.**

- A. Acceptable Applicator/Contractor: Trained and certified by Superior Products International II, Inc. and having the knowledge, experience, and skill to apply and install the Materials (Super Therm® and Enamo Grip to provide insulation

protection) using the proper equipment and application procedures as determined by Superior Products International II, Inc.

#### 2.4 Other Equipment Requirements.

- A. The applicator's/contractor's coating equipment shall be designed for application of materials specified and shall be maintained in first class working condition.
- B. Where ventilation is used to control hazardous exposure, all equipment shall be explosion-proof.
- C. Ventilation shall reduce the concentration of air contaminants to the degree that a hazard does not exist.

### **PART 3 - EXECUTION**

#### 3.1 Examination.

- A. All structural repairs must be made before preparation of surface and application of product begins.
- B. Thoroughly examine surfaces scheduled to be coated prior to commencing work.
- C. Report in writing to MIA's representative any condition that may affect proper application and overall performance of the coating system.
- D. Do not proceed with work until such conditions have been corrected.
- E. Commencing with work Indicates acceptance of existing conditions and responsibility for performance of applied coating.

#### 3.2 Surface Preparation.

- A. Surface must be clean from oil, tar, rust, grease, salts, and films.
  - 1. Power wash surface (3,500 psi or more unless directed by manufacturer) with TSP (tri-sodium-phosphate) or a citrus cleaner to remove all dirt, oil, tar, grease, or contaminants and previous coatings not tightly bonded.
  - 2. Use general degreaser if needed, but ensure that any degreaser residue is removed completely.
  - 3. When surface is clean, rinse well with water and pick up all rinse water using industrial wet/dry vacuum.
- B. Super Therm<sup>®</sup> must be applied during proper temperatures (below) and the prescribed overcoat window of the coating over which it will be applied.
  - 1. Maximum Surface Temperature when applying: 150 degrees F (65 degrees C).
  - 2. Minimum Surface Temperature when applying: 40 degrees F (5 degrees C).
  - 3. Maximum Surface Temperature after curing: 300 degrees F (149 degrees C).
- C. Surface must be completely dry and clean. Very Important.

## PART 4 - APPLICATION INSTRUCTIONS

### 4.1 Super Therm®.

#### A. Mixing Instructions.

1. Prior to the application of Super Therm®, the coating shall be mixed mechanically or by hand for three minutes and then applied.
2. Super Therm® should not be diluted or thinned. Water should not normally be mixed with Super Therm®.
  - a. However, Super Therm® becomes dry in pail, then add small amount of water, remix, and continue application (maximum: 1 pint per 5 gallon pail).
3. Colors shall be mixed during the manufacturing process, unless otherwise instructed by manufacturer.

#### B. Application of Super Therm®.

1. Super Therm® can be applied by brush, roller, or airless sprayer.
  - a. If application is by brush, use a soft or medium bristle brush. Two coats will be required to achieve the desired thickness when using a brush.
  - b. If application is by roller, use a 3/4 inch nap roller. Two coats will be required to achieve the desired thicknesses when using a roller.
  - c. If application is by spray, use a standard airless sprayer (2 gallons/minute at 3,300 psi or more) with a carbon steel or titanium tip sized between .029 and .032.
    - (i) NOTE: All filters should be removed from both the gun handle and spray machine prior to application as they will trap the ceramics.
2. Super Therm® must be applied at no less than a total of 16 mils wet (400 microns) and 10 mils dry (250 microns) for each application. Spread Rate is 100 sq ft per gallon. (9 sq meter per gallon).
  - a. It will take a minimum of two passes to achieve the minimum 16 mils wet.
  - b. Once the required wet mils are attained, allow a minimum of 24 to 36 hours for coating to dry in conditions of 70 degrees F (21 degrees C) at 40% Relative Humidity. Additional time may be required dependent on temperature and humidity.
3. If Super Therm® is applied during a period of high humidity or if there is rain after application, bubbles may appear on the surface. Do not puncture the bubbles. This is normal and the coating will continue to cure with no effect on the performance or appearance of the coating. Bubbles will disappear without a trace or imprint.
4. After completion, all equipment should be cleaned with soap and water. Cleaned brushes and rollers can be reused.

## 4.2 Enamo Grip.

- A. Enamo Grip is a two-part polyurethane enamel coating. Prior to application, the Enamo Grip base must be mixed with the Enamo Grip curing agent.
1. Open the pail and mix the base with the curing agent in a ratio of 3 to 1 (3 parts base : 1 part curing agent) (ratio by volume, not by weight).
  2. After combining the base and the curing agent, the coating shall be mixed by hand for two (2) minutes or with a power drill and mixing blade using low-medium speed for a minimum of thirty (30) seconds with NO vortex.
  3. When mixing Enamo Grip, stir slowly and avoid forming a vortex that will draw humid air into the mixture. If this happens, it can bubble and/or shorten pot life.
  4. NOTE: Once container is opened, the coating has a pot life of 4-6 hours at 70°F (21°C) or 1 hour at 90°F (32°C).
- B. One coat of Enamo Grip should be applied over the entire exposed surface area of Super Therm®.
1. Enamo Grip should be applied as a protective topcoat after the final coat of Super Therm® has been applied.
  1. Enamo Grip should not be applied over Super Therm® until it is fully cured and moisture has evaporated from the coating. Use a moisture meter to determine that the moisture content is two percent (2%) or less.
- C. Enamo Grip should be applied at no less than a total of 8 mils (200 microns) wet/3.92 mils (98 microns) dry (200 sq.ft./gallon; 18 sq.m/gallon) per coat.
- D. If breaks are taken, spray systems should be flushed with solvent. After completion, spray system should be flushed and cleaned with solvent. After completion, brushes and rollers should be discarded.

## PART 5 - CLEAN UP

### 5.1 Clean Up Equipment.

- A. After completion, spray systems should be flushed and cleaned with MEK or other comparable solvents.
- B. After completion, brushes and rollers can be cleaned with MEK or comparable solvents, stored and reused.

### 5.2 Clean Up Area.

- A. Upon completion, the applicator shall clean up and remove from site all surplus materials, tools, appliance, empty cans, cartons and rubbish which result from painting work. Site shall be left in a neat and orderly condition.
- B. Remove all protective drop clothes and masking from surfaces not being painted. Provide touch-up around same areas as directed by MIA representative.
- C. Remove all splatters and drippings.
- D. Upon completion of the work, all staging, scaffolding and containers shall be removed from the site or destroyed in a manner approved by MIA.



- E. The applicator shall keep the area of the work in a clean condition and shall not permit blast cleaning materials to accumulate as to constitute a nuisance or hazard to the execution of the work or the operation of the existing facilities.

## **PART 6 - PROTECTION**

### 6.1 Protection.

- A. Diligence should be taken to ensure that vehicles, equipment, fixtures, miscellaneous hardware.
- B. Surfaces not to be coated will be marked, removed, or otherwise covered to protect against cleaning and coating application procedures and weather. Care shall be exercised to avoid lapping on glass or hardware. Finished surfaces shall be free from defects or blemishes.
- C. Protective coverings or drop clothes shall be used to protect floors, fixtures, and equipment.

## **PART 7 - INSPECTION**

### 7.1 Inspection.

- A. After application of each coating in the specified system and its surface has cured, measure its thickness with a property calibrated dry film thickness gauge. Follow standard method for measurement of dry paint thickness.
- B. Make as many determinations as needed to ensure the specified thickness are achieved and make adjustments to all surfaces having less dry film thickness than specified until the specified thickness is achieved.

## **PART 8 -- LIMITED WARRANTY**

- 8.1 Superior Products International II, Inc. warrants that the SPI Coating Product(s) is manufactured in accordance with published specifications and shall be free from defects in material and workmanship which would affect performance during normal usage when the Product(s) is used for its intended purpose and is properly applied and maintained.