FIVE STAR PRODUCTS, INC.
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DESIGN-A-SPEC™ GUIDELINES
FIVE STAR® EPOXY NOVOLAC COATING

CONTENTS

This document is provided for informational purposes only and as a general guideline for consideration by contractors and engineers. While every reasonable effort has been made to ensure that this information is accurate and authoritative, Five Star Products does not warrant the accuracy or completeness of this information, or for its appropriateness for any particular purpose. The user of this document remains solely responsible for the specification of all methods, materials and practices.

PART A - GENERAL CONDITIONS - COATINGS

1.01 SCOPE

The work covered by this document consists of furnishing all equipment, materials, labor and performing all operations required for the application of epoxy novolac coatings as directed by the engineer or owner.

1.02 QUALITY ASSURANCE

A. The manufacturer shall have been in the business of manufacturing similar products for over ten years, maintain a strict quality assurance program, offer technical services, and provide a representative at the jobsite for product training, prior to product installation, upon written request.
B. The contractor shall submit to the engineer or owner, at least three job references where the contractor has successfully completed similar applications.

1.03 DELIVERY, STORAGE AND HANDLING

A. All materials shall be delivered to the jobsite in their original, unopened packages, clearly labeled with the manufacturer's identification, printed instructions, and batch code.
B. Store and condition the specified product in accordance with the appropriate product data sheet.
C. For handling instructions, refer to the Safety Data Sheet.

1.04 PROJECT/SITE CONDITIONS

Refer to PART C - PREPARATION, ENVIRONMENTAL CONDITIONS, or contact the manufacturer directly for any physical or environmental limitations required by the product.

1.05 MEASUREMENT AND PAYMENT

A. Measurement of the coating application shall be on a square foot (square meter) basis of material applied.
B. Payment for the coating application shall be at the unit price bid on a square foot (square meter) basis. This payment shall constitute full compensation for all labor, materials, tools, equipment, and other items as necessary to complete the work as described in the contract documents. Progress payments will be made on the percentage of the work satisfactorily completed during each payment period in accordance with the provisions of the contract documents.

PART B - MATERIAL SPECIFICATION - COATINGS

2.01 MATERIALS

A. The concrete / steel coating material shall be a highly chemical resistant, epoxy novolac based pre-packaged coating consisting of thermosetting resins. The manufacturer shall be ISO 9001 certified and have at least ten years experience in the manufacture of concrete coatings. The manufacturer shall offer technical services and provide a representative at the jobsite for product training prior to product installation upon five days advance notice.

B. The concrete coating material shall be suitable for exposure to strong acids, bases and solvents and meet all the following typical performance criteria when cured at 70°F (21°C):

1.	Compressive Strength, ASTM D 695 7 Days	10,000 psi (70.0 MPa)
2.	Hardness, Shore D ASTM D 2240	80-90
3.	Tensile Strength, ASTM D 638	5,600 psi (38.6 MPa)
4.	Film Thickness	15-24 mils
5.	Pot Life at 70°F (21°C)	35 minutes
6.	In-Service Time (allow 3-5 days for maximum cure)	1-7 days
7.	In-Service Time (hydrocarbons)	24 hours
8.	Tack-Free Time	3 hours
9.	Color	Light Gray

The data shown above reflect typical results based on laboratory testing under controlled conditions. Reasonable variations from the data shown above may result.. Test methods are modified where applicable.

C. An acceptable product which meets these criteria is:

Five Star® Epoxy Novolac Coating

As manufactured by Five Star Products, Inc., Shelton, CT, 06484 (203) 336-7900.

D. Subject to meeting the performance criteria stated above, other products may be formally submitted to the engineer for approval up to three days prior to the bid date. All requests for approval shall contain certified test data verifying conformance with this

specification. Three references of successfully completed projects of similar nature and scope of the work detailed in this specification shall be provided, as well as a minimum ten-year history of use in the industry. The testing laboratory shall certify to any modifications made to the tests performed and provide details of modifications.

PART C – PREPARATION - COATINGS

3.01 CONCRETE SURFACES

A. Surfaces should be clean and sound. Remove dust, laitance, grease, curing compounds, impregnations, and waxes. Concrete should be sandblasted or prepare by other acceptable mechanical means. Five Star® Epoxy Novolac Primer should be applied to concrete surfaces prior to installation of coating. For further details on Concrete Surface Profiles, refer to ICRI Technical Guidelines No. 03732 ***Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays.***

B. Concrete must be a minimum of 7 days and coated with Five Star® Epoxy Novolac Primer prior to application of Five Star® Epoxy Novolac Coating.

C. All cracks and joints not subject to movement shall be chipped open and prepared as necessary; then filled with a suitable filler material. Leave the surface rough to ensure bond of the coating.

D. All cracks and joints subject to movement shall be treated as directed by the engineer.

E. Patch all honeycombed or spalled concrete, and holes with a compatible repair material. Leave the surface of the repair rough to ensure bond with the coating.

3.02 STEEL SURFACES

A. Steel surfaces should be clean, dry and blasted to an SSPC – SP6 finish. Remove all oils, paints, coatings, and debris from steel surfaces prior to coating application. Coating is self-priming for most metal surfaces.

3.03 ENVIRONMENTAL CONDITIONS

A. Condition and maintain all materials to between 65°F and 85°F (18°C and 29°C). Condition all surfaces that contact coatings to between 40°F and 90°F (7°C and 32°C) at time of application. Shade from direct sunlight, as necessary.

3.03 EQUIPMENT AND MATERIALS

A. All necessary tools, equipment and materials shall be in good condition and as close as possible to area being coated.

B. Appropriate clothing and safety equipment shall be worn to avoid breathing dust and prevent eye and skin contact with both dry and mixed repair materials.

3.04 MIXING

Drill and Paddle Mixer

A. Five Star® Epoxy Novolac Primer: Pour all of Component B into Component A and mix thoroughly for 2-3 minutes. For smaller amounts, mix Component A (resin) and Component B (hardener) in a 2:1 ratio by volume. Do not mix more material than can be applied within pot life of material, 30 minutes at 70°F (21°C).
B. Place mixed material immediately after mixing.
C. Five Star® Epoxy Novolac Coating: For optimum performance, all components should be conditioned to between 65°F and 85°F (18°C and 29°C). Premix both Component A (resin) and Component B (hardener) thoroughly before mixing. Place all of Component A and Component B into a suitable container. Component A and Component B are mixed in a 3:1 ratio by volume. Mix Component A and Component B with a slow speed mixer for no more than 3 minutes. Avoid air entrapment. Place mixed material immediately. Mix only that amount of material that can be placed within 35 minutes.

PART D – APPLICATION - COATINGS

4.01 PLACEMENT PROCEDURES

A. Primer: Apply Five Star® Epoxy Novolac Primer at a 3–5 wet mil thickness using roller, squeegee, or brush or sprayed using airless equipment. Maximum recommended thickness is 5 mils if topcoating. Do not puddle primer during placement. Apply primer evenly and allow to dry for 1–6 hours prior to coating placement. Coating may be applied after primer surface is tacky to the touch. Place coating within 1 to 30 hours of primer placement, depending on curing temperatures.
B. Coating: For single coat process apply Five Star® Epoxy Novolac Coating at 15-24 mil thickness with roller, squeegee or brush or may be sprayed using airless equipment. Apply material in even coats. Allow coating to self-level over area as it is applied. Do not puddle coating. Ensure wet edge is maintained during application.
C. For multiple coat process, apply initial base coat at approximately 10-15 mil thickness using roller, squeegee, or brush. Allow coating to self level over area as it is applied. Do not puddle coating. Ensure wet edge is maintained during application. Allow base coat to cure for approximately 30 minutes to 14 days, depending upon temperatures until base coat is tack free, then apply topcoat in similar manner. If topcoat cannot be applied within proper recoat window of base coat, solvent wipe all existing base coat surfaces thoroughly leaving no puddles of solvent then apply topcoat.
D. For skid resistant surfaces, broadcast oven dried sand uniformly over coating surfaces until rejection. Remove excess sand after curing by suitable method such as compressed air, vacuum, or broom.

PART E – POST PLACEMENT - COATINGS

5.01 CURING

A. Protect coating from temperature extremes, moisture, rain and freezing for 3– 5 days after application.
B. In service operation for hydrocarbons may begin in 24 hours after placement at 70°F (21°C). Allow 3-5 days for maximum cure at 70°F (21°C).

PART F – EXTREME WEATHER CONDITIONS - COATINGS

6.01 COLD WEATHER COATING

[Low temperatures delay the set, increase working time, delay the strength development and in –service time of epoxy products. The procedures below may help compensate for these conditions.]

A. Materials shall be conditioned as necessary so that the mixed material is between 65°F and 85°F (16°C and 29°C). Up to 48 hours of pre-conditioning may be necessary depending upon quantity of material. Store coating components in a warm or heated environment.
B. All surfaces in contact with coating must be preconditioned and maintained at a temperature between 40°F and 90°F (4°C and 32°C) for a minimum of 24 hours.
C. Heating shall be accomplished by indirect exposure. Where used, heated enclosures must be windproof and weatherproof. Combustion heaters must be vented and shall not be permitted to heat and dry the substrate or coating locally. *Caution: Exhaust gases may contaminate or cause carbonation within the enclosed environment.*

PART F – EXTREME WEATHER CONDITIONS - COATINGS

6.01 HOT WEATHER COATING

[High temperatures accelerate the set, decrease working time, and accelerate the strength gain of epoxy products. The procedures below may help compensate for these conditions.]

A. Materials shall be pre-conditioned as necessary so that the mixed material is between 60°F and 90°F (16°C and 32°C). Up to 48 hours of pre-conditioning may be required depending upon quantity of material. Store coating components out of direct sunlight in a cool, shaded area.
B. All surfaces in contact with coating must be pre-conditioned and maintained below 90°F (32°C) for a minimum of 24 hours. Apply coating at night or early morning when temperatures are lowest.
D. Wind breaks shall be provided when necessary to prevent rapid drying.