

# General Guide Specification

## SECTION 09800 - SPECIAL COATINGS / FLEXIBLE LINING

### General Specification for Special Elastomeric Coating Systems EnviroLastic® AR 200 HD, AR 425, AR 520 SS, AR 520 PW and AL 450 SS

#### PART 1 - GENERAL

##### 1.01 Related Documents

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions apply to this section.

##### 1.02 Description of Work

- A. This Section specifies the application of special coating / lining systems to items and surfaces scheduled, including surface preparation, bug-hole filling, prime coats and top coats. The primary coating material shall be a solvent free, fast-setting (6-60 seconds), 100% polyurea elastomeric coating and lining system formulated to be used for applications requiring a seamless, flexible, waterproof, abrasion and impact resistant surface that may be applied on a multitude of substrates in low temperature and high humidity.
- B. Types of Special Coating / Lining Systems required for the Project include the following:
  - 1. EnviroLastic® AR 425: two-component, 100% solids, pigmented, fast-cure, aromatic polyurea with 425% elongation and 15 second gel time.
  - 2. EnviroLastic® AR 200 HD: heavy-duty, two-component, 100% solids, pigmented, fast-cure, aromatic polyurea with 200% elongation and 6 second gel time.
  - 3. EnviroLastic® AL 450: two-component, 100% solids, pigmented, fast-cure, aliphatic polyurea with 450% elongation and 60 second gel time.
  - 1. EnviroLastic® AR 520 SS: two component, 100% solids, pigmented, aromatic polyurea with 60 second gel time to allow for broadcasting of aggregate.
  - 2. EnviroLastic® AR 520 PW: two component, 100% solids, pigmented, aromatic polyurea with 60 second gel time. Potable Water approved.

##### 1.03 References and Standards

- A. All references and standards listed shall be the latest revisions.
- B. American Society for Testing and Materials (ASTM)
  - 1. ASTM E-1907: Calcium Chloride Test for Moisture Vapor Transmission.

2. ASTM E-337: Test Method for Measuring Humidity with a Psychrometer.
  3. ASTM D- 4541: Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
  4. ASTM D-5162: Standard Practice for Discontinuity (Holiday) Testing of Non-Conductive Protective Coating on Metallic Substrates.
  5. ASTM D-4787: Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates.
- C. Society of Protective Coatings (SSPC)
1. SSPC SP-10: Near White Metal Blast.
  2. SSPC- VIS 1: Visual Standard for Abrasive-Blast Cleaned Steel.
  3. SSPC SP-7: Surface Preparation Specification, Brush-Off Blast Cleaning.
  4. SSPC TU-13: Surface Preparation of Concrete.
  5. SSPC TU-2: Design, Installation and Maintenance of Coating Systems for Concrete Used in Secondary Containment.
- D. National Association of Corrosion Engineers (NACE)
1. NACE Standard RP0178: Fabrication Details, Surface Finish Requirements, and Proper Design Considerations for Tanks and Vessels to be Lined for Immersion Service.
  2. NACE No. 2: Near-White Metal Blast Cleaning.
  3. NACE Standard RP0188: Discontinuity (Holiday) Testing for Protective Coatings.
  4. NACE Standard RP0892: Linings Over Concrete for Immersion Service.
  5. NACE No. 6: Surface Preparation of Concrete.
  6. NACE 6G197: Design, Installation and Maintenance of Coating Systems for Concrete Used in Secondary Containment.
- E. International Concrete Repair Institute (ICRI)
- A. ICRI Technical Guidelines 03730: Surface Preparation Guidelines for the Repair of Deteriorated Concrete Resulting from Reinforced Steel Corrosion.
  - B. ICRI Technical Guidelines 03731: Guide for Selecting Application Methods for the Repair of Concrete Surfaces.
  - C. ICRI Technical Guidelines 03732: Guide for Selecting and Specifying Surface Preparation for Sealers, Coatings and Membranes.

#### **1.04 Submittals**

- A. Submit manufacturer s technical data, MSDS and product literature indicating that the products comply with specified requirements. If submitted material is not as specified, submit complete test results from independent lab for all tests listed.
- B. Submit 2 sample coupons (6" x 6") that are representative of the finished coating surface, texture, and color. Approved samples shall serve as basis for acceptance of the work for the duration of the project.
- C. Submit Material Manufacturer s and Equipment Manufacturer s written certification of Approved Contractor, Contractor s qualifications, and list of project references.

- D. Submit sample joint warranty certificate.

### **1.05 Quality Assurance**

- A. Single Source Responsibility: Provide primers and undercoat materials produced by the same manufacturer, or recommended by manufacturer, for each type of Special Coating / Flexible Lining specified to ensure compatibility, and proper chemical and mechanical bond.
- B. Manufacturer: A company specializing in manufacturing industrial grade polyurea coatings with a minimum 5 year documentable satisfactory experience.
- C. Applicator: A company specializing in applying polyurea coatings with a minimum 5 years satisfactory documented experience, and coating manufacturer s certification showing evidence of annual recertification of its applicators. Applicator must have completed a 40 hour certification program in the use of heated plural-component pumping equipment, and the specified polyurea material.

Applicator must own the plural component pumping equipment.

Applicator must furnish references of projects of similar field conditions at least 5 years old, including name, address and telephone number.

- D. Equipment Requirements: Equipment must be a plural component impingement mixing unit capable of consistently producing at 2+ gallons per minute at 2500 psi, 160°F.
- E. Substitutions: Manufacturers seeking approval of products other than the specified system must supply cured samples, full product information, project histories and references, technical data with specifications, MSDS and certifications regarding conformity of performance properties from an independent testing laboratory. The product being submitted for approval must meet all requirements of the performance properties specified within this specification (Appendix A-D). Contractors seeking approval to install substitute materials shall provide documented proof of training and approved status by equipment and material manufacturers. Compliance with the above quality assurances must be provided in written form at least fourteen (14) days before bids are received. Omission or nonconformance of any item will result in rejection of the request.

### **1.06 Delivery, Storage and Handling**

- A. Deliver product in the manufacturer s original, new, unopened packages and containers, clearly marked with manufacturer s identification, printed instructions, lot numbers and shelf life expiration date for each component.
- B. Store materials not in use in tightly covered containers in a dry, well-ventilated area at an ambient temperature between 50°F- 90°F, away from sunlight, heat, or other hazards.

## **1.07 Project Conditions**

- A. For temperatures below 35°F, consult manufacturer.
- B. Concrete must be free of excessive moisture vapor transmission (MVT), and negative side water intrusion. Substrates in contact with ground must have a properly installed, effective vapor barrier. A 28-day cure time is not always indicative of an adequate cure for coating purposes. Concrete must have 3 pounds or less of MVT when tested per ASTM E-1907. Do not place Special Coating / Lining System over metal pan decks, split slab membranes, or other locations containing trapped moisture without prior approval from manufacturer.
- C. Concrete to receive Special Coating / Lining System shall have been designed and installed as approved by Architect / Engineer to minimize random cracking, curling, and slab deflections, and shall contain properly designed control and isolation joints as approved by Architect / Engineer. Concrete shall have proper slope to drains as indicated on the drawings, and proper levelness as specified.
- D. Do not apply sealers or membrane curing agents to concrete. Moisture curing of concrete or the use of sodium silicate-based curing compounds is recommended.
- E. Concrete must be sound with a minimum of 3,000 psi compressive strength, and a minimum tensile strength of 350 psi. Substrates containing lightweight aggregates or of steel joist construction are not recommended.
- F. Provide adequate ventilation, scaffolding, lighting and clean, drinkable water supply.
- G. Special Coating / Lining Systems shall be installed prior to installation of any floor-supported equipment or cabinetwork, plumbing fixtures, radiators, paint and other decorative finishes, etc.
- H. Surfaces shall be kept free of traffic once surface preparation has begun, and no trades shall be permitted in areas during the application and curing of the coating.
- I. Protect adjacent surfaces from damage resulting from work of this trade. If necessary, mask and / or cover adjacent surfaces, fixtures, equipment, etc. by suitable means.
- J. Do not apply material over frozen or ice capped surfaces.
- K. Do not apply coating / lining system over oil soaked or chemically contaminated substrates.

## **1.08 Warranty**

- A. Contractor shall provide a one (1) year limited joint warranty on a single document, with the manufacturer, against defects of material and workmanship. Warranty shall commence on the Date of Substantial Completion.
- B. Any defective work discovered during the one year warranty period shall be corrected by

the Contractor in accordance with the manufacturer at no additional expense to the Owner.

- C. The one (1) year limited joint warranty excludes failure caused by moisture vapor transmission (MVT), negative-side moisture migration, failure of the substrate, abuse, conditions that exceed the limitations of the materials, sufficiency of the design, incidental and consequential damages, and other causes beyond the Contractor's control.

## **PART 2 - PRODUCTS**

### **2.01 System Performance Requirements**

- A. **Material Compatibility:** Provide coating, repair materials, primers, bug hole fillers, finish coat and related materials that are compatible with one another and the substrates indicated under conditions of service required as recommended by the manufacturer.
- B. **Special Coating / Lining System** must meet or exceed all of the physical properties, test results, and certifications per Product Data Sheets Attached to this specification.

### **2.02 Acceptable Manufacturers**

- A. The Sherwin-Williams Company  
11410 Alameda Drive  
Strongsville, OH 44149  
Phone: 440-846-4107  
Fax: 440-846-4349  
website: [www.sherwin-williams.com](http://www.sherwin-williams.com)

### **2.03 Materials**

- A. **Special Coating / Lining Systems:**
  - 1. EnviroLastic® AR 425 (See Attached Product Data Sheet)
  - 2. EnviroLastic® AR 200 HD (See Attached Product Data Sheet)
  - 3. EnviroLastic® AR 520 SS (See Attached Product Data Sheet)
  - 4. EnviroLastic® AL 450 SS (See Attached Product Data Sheet)
  - 5. EnviroLastic® AL 520 PW (See Attached Product Data Sheet)

### **2.04 Related Materials**

- A. **Repair and Resurfacing Materials for Concrete:**
  - 1. As approved by manufacturer.
- B. **Sealants for Concrete and Steel:**
  - 1. Sherwin-Williams ProSelect Stampede
- C. **Primers for Concrete and Steel:**
  - 1. Sherwin-Williams Corobond Conductive Epoxy Primer
  - 2. Sherwin-Williams Corobond HS Epoxy Primer

3. Sherwin-Williams Corobond LT Epoxy Primer
- D. Special Topcoat (Optional):
  1. [Contact Sherwin-Williams for recommendations.]

## **PART 3 - EXECUTION**

### **3.01 Site Inspection and Testing**

- A. Perform Calcium Chloride Tests in accordance with ASTM F-1869.
- B. Ensure that environmental and site conditions are suitable for application and curing. Temperature of the surface to be coated must be at least 5° above the dew point temperature of the air. Check dew point in accordance with ASTM E-337 or by using approved digital instrument.
- C. Special Coating / Lining System will follow the contours of the substrate. Notification that the substrate is ready to be coated indicates the Owner's acceptance of the substrate's levelness, pitch to drains, etc.
- D. Inspect surfaces for contamination and other critical factors at time of installation. Surfaces to receive coatings must be structurally sound, thoroughly dry and concrete fully cured before coatings are applied. Report in writing to Architect / Engineer, with copy to manufacturer, of deficiencies that could impair work. Do not proceed with coating application until unsatisfactory conditions have been corrected.

### **3.02 Concrete / Steel Repairs**

- A. Concrete:
  1. Concrete must be structurally sound and free of all voids and delaminations. Refer to Section 03300 or 03730 for repair procedures, or, if not available, follow ICRI Technical Guidelines 03730 and 03731, or manufacturer's recommendations.
  2. Cracks in excess of 1/16" shall be routed and sealed in accordance with manufacturer's recommended details.
- B. Steel:
  1. Steel substrate shall be structurally sound.
  2. All welds shall be continuous and ground smooth or filled. Weld spatters, burrs, gaps, skip welds, slag, etc. shall be removed. Sharp edges shall be ground smooth. Adhere to NACE standard RP0178, latest revision.

### **3.03 Surface Preparation**

- A. Concrete:
  1. Degrease as necessary using high pressure water and biodegradable detergents. Rinse thoroughly.

2. Remove all existing coatings and linings by best (acceptable) method available. Only well-bonded coatings and linings may remain. Consult manufacturer.
3. Remove all laitance, contamination, curing compounds, by shotblasting wet or dry, grit blasting, or other method approved by manufacturer to achieve a profile equal to 80 - 100 grit sandpaper (ICRI 1-3). Acid etching is not an acceptable means of surface preparation.
4. Surface must be clean, sound, and dry prior to application.
5. Refer to ICRI Guide 03732 and NACE No. 6 / SSPC-SP 13.
6. Key-in all termination points not in natural termination points in accordance with manufacturer s details.

**B. Steel:**

1. Remove all existing coatings and linings by best (acceptable) method available. Only sound well-bonded liners may remain. Consult manufacturer.
2. Degrease as necessary using high pressure water and biodegradable detergents. Rinse thoroughly.
3. Provide a Near White Metal blast to SSPC-SP-10 or NACE 2, with a 3 mil anchor profile for immersion, 2 mil for less severe conditions. Determine profile per SSPC-VIS 1.
4. Avoid flash rusting. If flash rust occurs, all traces shall be removed per SSPC SP-7.

**3.04 Priming / Bug-Hole Filling / Sealing**

- A. Prime with the appropriate primer system, following manufacturer s recommendations and coverage rates. Steel substrates may not require priming unless marginal conditions exist.
- B. Fill all bug-holes with the appropriate filler, following manufacturer s recommendations and detail drawings. Press material firmly into all voids.
- C. Seal perimeter of all penetrations, supports, etc., and at all inside corners at changes in plane (i.e., wall/slab intersections) in accordance with manufacturer s detail drawings.

**3.05 Installation**

- A. Apply detail coat 5" wide by 30 mils thick over all cracks, profile changes, pipe penetrations, etc. in accordance with manufacturer s details.
- B. Apply Special Coating / Lining System in a single application in accordance with manufacturer s instructions and detail drawings to a total thickness of (10 mils to 250 mils) or greater. Spray apply only through required equipment. Maintain an even distance from surface providing a uniform application with a 50% overlap from one pass to the next.
- C. Thicknesses of Special Coating / Lining System:
 

1. Pedestrian Traffic	40-60 mils
2. Vehicular	60-80 mils
3. HD Vehicular / High Abuse	70-125 mils
4. Immersion Service	60-100 mils

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|----|---------------------------|------------|
| 5. | Walls (non-immersion)     | 30-60 mils |
| 6. | Below Grade Waterproofing | 50-60 mils |

- D. Extend coating system up onto vertical surfaces minimum of 3" where shown, and terminate per manufacturer s detail drawings. Produce a clean edge without overspray on uncoated surfaces.
- E. To overlap detail coat or coating / lining system more than 16 hours old abrade areas requiring overlap, scrub in MEK until surface is tacky. Allow solvent to flash off. of 2'-6" over existing prepared coating / lining. If longer than 12 hours, refer to manufacturer s recoat instructions.
- F. Apply special topcoats (if specified) per manufacturer s written instructions.
- G. Repairs or re-coating after recoat window:
  1. Abrade surface to be repaired and 6" beyond the repair area to roughen and dull surface.
  2. Scrub in MEK material and allow to dry.
  3. Reapply Special Coating / Lining System or other approved material as soon as area is dry.
  4. Reapply special topcoats (if specified).

### **3.06 Cleaning**

- A. Cleanup: At the end of each work day, remove rubbish, empty containers, rags and other discarded items from the site. After completing work, clean glass and spattered surfaces. Remove spattered coatings by washing, scraping, or other methods, being careful not to scratch or damage adjacent finished surfaces.

### **3.07 Field Quality Control (Optional)**

- A. Holiday Testing: Test the entire surface of protective liner by spark testing at 100 volts per dry mil of lining thickness as per NACE Standard RP0188 or ASTM D-5162 (steel) or ASTM D-4787 (concrete). Mark and repair per manufacturer s recommendations.
- B. Adhesion Testing: Per manufacturer s recommendations following ASTM D 4541.
- C. Mil Thickness Testing: Positest Magnetic Dry Film thickness gauge for nonferrous coatings over ferrous metals.
- D. Skid Resistance: Provide mock-ups of various textures to use for quality control. If skid resistance tests are required, conform to ASTM D-2047.