



## New Polyaspartic Coating Technology Hits a Home Run at Florida Baseball Facility

Champion Stadium – Spring Training Facility of the Atlanta Braves – at Wide World of Sports Disney World was in trouble. Water was seeping through cracks in the concrete, and it was beginning to damage the superstructure. There was just one thing to do – call in the professionals.

Contractors Gary Roy and Marcy Roy of Shield Coatings and Waterproofing asked Ken Jane, president of Epoxy Floor Solutions Co., and Brad Higgins, East Coast director of technical support for Tufflex Inc., to look into the problem. After a thorough examination of the 125,000 square foot stadium, they discovered that a membrane between the structural concrete slab and the topping slab had failed in areas, allowing water to seep through. To stop the leaks they needed teamwork.

The contractors worked with Tripp Ishmael, director of the polymers division of Elastomer Specialties Inc. (ESI). Together, they recommended applying a new external membrane to the concrete topping. The topcoat they suggested was a specially formulated color coat based on polyaspartic coating technology from Covestro LLC.

Polyaspartics provide the faster dry times and higher film builds needed to develop the waterproof coat. The final result is an exceptionally durable, UV stable coating that can be applied quickly and cost-effectively. In the case of Champion Stadium at Wide World of Sports Disney World, the new coating technology meant the team could be back on the field – and fans back in the stands – within a very short period of time.

The common walkways and patios were first prepared with a dust-free shot blasting to achieve a good mechanical profile and clean surface. The vertical and horizontal surfaces in the seating areas were cleaned using hydro-demolition, with 15,000 to 20,000 psi of water on an oscillating tip. Once the debris was vacuumed out, a two-component, moisture tolerant epoxy primer was then applied.

Applying the new membrane was simple, thanks to a multi-material broadcast from Tufflex. Because the Tufflex product is based on an internally catalyzed, water cured technology, all the cracks were filled in a single lift using a trowel and squeegee. Approximately two hours after application, the membrane reached a gel stage and was ready for the polyaspartic color coat.

Because the finish coat needed to stand up to years of heavy pedestrian and cart traffic as well as torrential rains, soda pop, ketchup and mustard, it was tested by stadium personnel prior to application. Project managers weren't surprised to find that the flexible 0-VOC polyaspartic color coat from Covestro outperformed traditional polyurethane in that it retained its sheen for a much longer time, and was far easier to clean.

According to Brad Higgins, "We are so convinced of the quality of the Covestro products, and ESI's ability to formulate the raws to our needs, that we have embarked on a whole new program of systems and specifications that will incorporate these materials."

In the end, there were no runs, no drips, and no leaks – all adding up to a winning combination for the contractors, the Atlanta Braves, and the facility at Disney World.

# SSPC Paint Specification No. 39<sup>+</sup>

## Performance-Based Two-Component, Weaterable Aliphatic Polyurea Topcoat Specification, Fast or Moderate Dring

### Scope

This specification contains performance requirements for a two-component, weaterable polyurea topcoat. The coating may be fast or moderately fast drying.

Coatings meeting the requirements of this specification are generally suitable for exposures in Environmental Zones 1A (interior, normally dry), 1B (exterior, normally dry), 2A (frequently wet by fresh water, excluding immersion), and 2B (frequently wet by salt water, excluding immersion). Resistance of polyurea topcoats in Environmental Zones 3B (chemical exposure, neutral), and 3C (chemical exposure, alkaline) can vary based upon formulation. The coating manufacturer should be contacted for specific chemical resistance data if required.

The specified coating is intended for application by single-component airless spray, electrostatic spray, or plural-component equipment, depending upon its formulation. This coating is intended for use as a topcoat over suitably primed ferrous metal and cementitious substrates.

### Description

The resins used in the coating shall result in a polyurea product that is comprised primarily of polyamine and crosslinkers for polyurethanes that react to form a polyurea.

### Coating Type:

The two types of polyurea coatings are differentiated by drying time (per ASTM D 1640).

- Type 1 (Fast Drying): A Type 1 coating dries to handle in less than 30 minutes.
- Type 2 (Moderate Drying): A Type 2 coating dries to handle from 30 minutes to 2 hours.

### Resin Types:

A coating meeting the requirements of this specification shall be a hindered aliphatic polyurea, non-hindered aliphatic polyurea, or hybrid coatings.

### Weathering Levels:

This specification contains three levels of accelerated weathering (Levels 1A, 2A and 3A) and two levels of outdoor weathering performance (Levels 1N and 2N). Table 1 specifies the amount of time the coating must perform, before noticeable color and gloss change, in order to achieve the defined performance level. A certain level of accelerated weathering does not necessarily correspond to a particular level of atmospheric weathering. The specifier shall stipulate the requirements for outdoor weathering, accelerated weathering, or both. These are two independent, complementary tests for measuring coating performance. If no performance level and/or specific weathering test is specified, Level 3A for accelerated weathering (longest accelerated exposure) will be assumed.

Polyurea topcoats are available in a wide range of color and gloss. Procurement documents shall state the desired level of performance, exposure method, color and gloss. For example, a specifier may require Level 2N outdoor exposure, initial gloss greater than 80, matched to a specific color.

This specification addresses performance properties of only white and pastel colored individual coatings. Because dark pigments are more sensitive to ultraviolet degradation, testing of individual coatings in deep tones and safety colors is necessary to establish their color and gloss retentive properties.

### Composition

This is a performance-based coating specification, therefore the manufacturer is given wide latitude in the selection of materials and manufacturing processes.

### Resin Definition:

The reactive components used in the coating shall be comprised primarily of polyamine and crosslinkers for polyurethanes resins that react to form a polyurea.

### Reference Standards

The standards referred in this specification are listed in sections 3.3 through 3.8 in the complete specifications.

### Weathering Requirements

#### Weathering Resistance:

Two weathering test procedures are described below. Test data may not be available for the desired color and gloss specified. Performance levels are established using whites and light colors. Outdoor testing is preferred. If outdoor weathering test data is not available for the desired color and gloss specified, accelerated test data shall be used until outdoor weathering data becomes available. It is left to the discretion of the specifier whether to accept outdoor data from a similar color or to use UV-A data in lieu of outdoor weathering data.

**Table 1**  
Summary of Performance Testing Results to be Reported

Exposure Test	Performance Level	Exposure Tin	Measurement Test/ Minimum Criteria <sup>b</sup>	
			Color Change ASTM D 2244 (Color change in $\Delta E$ ) <sup>a</sup>	Maximum Gloss Reduction from Original Reading per ASTM D 523
Accelerated Weathering <sup>c</sup> ASTM D 4587 Cycle 2	Level 1A	500 h	< 2.0	20%
	Level 2A	1000 h	< 3.0	30%
	Level 3A	2000 h	< 3.0	40%
South Florida Weathering ASTM D 1014	Level 1N	12 mo	< 2.0	35%
	Level 2N	24 mo <sup>d</sup>	< 3.0	50%
<b>TEST METHOD</b>			<b>CRITERIA</b>	
Solvent resistance (ASTM D 5402)		100 double rubs with MEK	No visible topcoat on cloth	
Pull-Off Adhesion (ASTM D 4541, Type III or IV)			Avg. of 3 pulls > 4.1 MPa (600 psi) 2 pulls, each > 4.1 MPa (600 psi) 1 pull > 3.4 MPa (500 psi)	
Dry-Through (or Dry-To-Handle) Time (ASTM D 1640)			Type 1	Less than 30 minutes
			Type 2	30 minutes to 2 hours

- a** Smaller values of color change (less than 2.0  $\Delta E^*$ ) may be visible to the eye, but the noticeable change maximum of 3.0  $\Delta E^*$  specified herein is deemed acceptable for most industrial and marine applications. More stringent gloss and color retention requirements should be specified as needed.
- b** These values do not apply to deep tones and safety colors.
- c** Either outdoor or accelerated testing will fulfill the requirements of this standard. The user must stipulate the type of testing to be used. Both tests are not required unless specified.
- d** South Florida testing is ongoing. 24-month testing was completed in July 2003 and testing is continuing to obtain 48-month data.

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