

Specifying Concrete Floor Coatings and Treatments: Aggressive Environments

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Agenda

- ❑ Selection Criteria for Aggressive Environments
- ❑ Concrete Coatings and Treatments Options
- ❑ Review Specific Functional Spaces and Selection Options
- ❑ Specification, Details, and Installation Monitoring
- ❑ Maintenance

Aggressive Environments

(A) **Light service** refers to exposure conditions such as light traffic (i.e., foot traffic and light rubber wheeled carts), moisture, nonaggressive chemicals or freeze/thaw cycles.

(B) **Severe service** refers to exposure conditions such as heavy machinery traffic (i.e., forklifts, heavy trucks, or steel wheeled carts), deleterious chemicals, immersion or thermal shock (e.g., hot water washing or steam cleaning).

(C) **Severe service** (concrete): Environments in which surfaces and applied coatings have significant exposure to traffic, chemicals, or changes in temperature.

^{A, B} NACE/SSPC JOINT SURFACE PREPARATION STANDARD NACE No. 6/SSPC-SP 13 “Surface Preparation of Concrete”)

^C SSPC Coatings Specification No. 44 (Wastewater)

Aggressive Environments Evaluation

Service Conditions

- Chemical exposure
 - Organic or Inorganic Acids
 - Caustics/Alkalies
 - Oils/Hydrocarbons
 - Oxidizing Agents
 - Solvents
- Temperature & duration of exposure
- Abrasion and impact
- Heavy Traffic

Installation Conditions

- Condition of the substrate
- Environment during installation

Selection Criteria for Aggressive Environments

1. Performance

- Abrasion**
- Chemical Resistance**
- Thermal Exposure
- Slip Resistant/Texture
- Installation Schedule
- Installation Environment
- Ability to Resurface
- Maintenance Schedule
- Service Life

2. Aesthetics

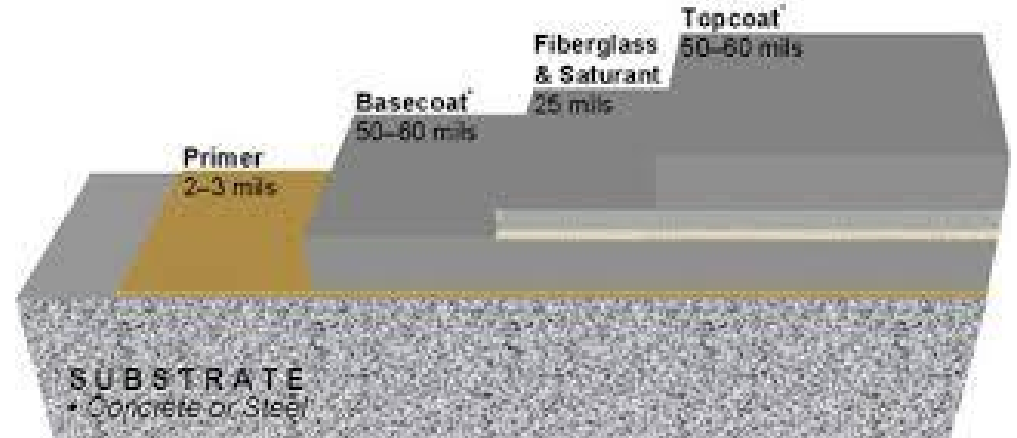
- Color(s)
- Gloss
- Design

3. Cost

- Initial
- Maintenance
- Cost of Replacement

Systems Overview

1. Coatings (thin film)
2. High Build Resinous Systems
 - a. Slurry/self-leveling
 - b. Broadcast
 - c. Troweled
3. Reinforced Systems



* F-4 powder mixed with resin

Thin Film Coatings

Performance Benefits

- ❑ Protects concrete from wear
- ❑ Protects concrete for chemical attack
- ❑ Texture options
- ❑ Gloss/Sheen options
- ❑ Wayfinding (safety)
- ❑ Low installed cost

Limitations

- ❑ Limited wear
- ❑ Generally not breathable
- ❑ Not good for thermal shock (CTE)
- ❑ Reflects concrete surface profile

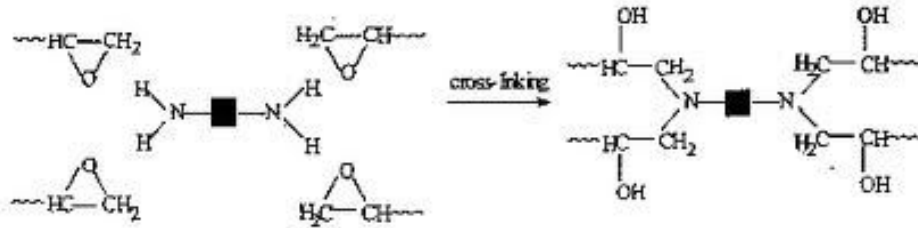
Resin Chemistry

Polymer Backbone and Reactive Crosslink

- Epoxy/Curing Agents
- Novolacs
- Polyester/Vinyl Ester
- Polyurethane/Polyethers
- Methyl Methacrylate
- Polyurea/Polyaspartic
- Hybrids/UV-Cure

Functionality

- Speed of Cure
- Cure Temperature
- Chemical Resistance
- Abrasion Resistance
- Flexibility
- Adhesive/Cohesive Strength
- UV stability



Resin Chemistry - Chemical Resistance

	Alkalis		Acids			Solvents		Bleach
	Strong	Weak	Inorganic	Organic		Organic	Inorganic	
				Weak	Moderate			
Epoxy	Good	Good		Good	Good	Varies		Good
Novolac	Good	Good	Good	Good	Good	Good	Good	Good
Methylmethacrylate		Good		Good	Good	Good	Good	
Polyaspartic	Good	Good		Good	Varies	Varies		
Polyester		Good		Good	Good	Good	Good	Good
Polyurea	Good	Good		Good	Varies	Varies		
Urethane	Good	Good	Good	Good	Good	Good	Good	Good
Vinyl Ester		Good	Good	Good	Good			Good

Chemical Resistance Testing

Applied on Substrate:

- **ASTM D6943** - Standard Practice for Immersion Testing of Industrial Protective Coatings and Linings (Replaced: ASTM C868)
- **NACE TM0174** - Laboratory Methods for the Evaluation of Protective Coatings and Lining Materials on Metallic Substrates in Immersion Service (substitute concrete as the substrate)
- **ASTM D4398** - Standard Test Method for Determining the Chemical Resistance of Fiberglass-Reinforced Thermosetting Resins by One-Side Panel Exposure

Free Film or Specimens:

- **ASTM C267** - Standard Test Methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes
- **ASTM C413** - Standard Test Method for Absorption of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- **ASTM D543** - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents

Broadcast, Slurry, Trowel Flooring

Performance Benefits

- ❑ Resurfaces Concrete
- ❑ High Impact/Point Load Capacity
- ❑ Thermal Shock Prevention (CTE α)
- ❑ Cove Base Option
- ❑ Waterproof Option
- ❑ Variable Texture Capability
- ❑ Cover Control Joints

Limitations

- ❑ Multi step installation process
- ❑ Thinner systems may reflect substrate unevenness
- ❑ May not be breathable

Aggregates

Types of Aggregate

- Powders
- Cement (reactive)
- Silica Sand
- Mica/Graphite
- Fiberglass
- Colored Quartz
- Paint Chips



Application Methods

- Broadcast
- Slurry/Self-Leveling
- Mortar
- Combination



Performance Impact

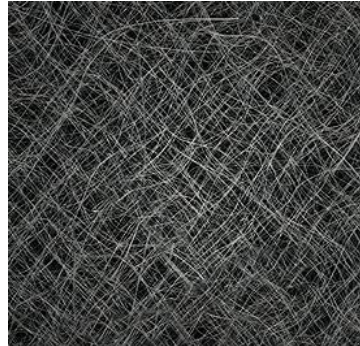
- Thickness
- Texture
- Aesthetics
- Permeability
- Impact Resistance
- Abrasion Resistance
- Chemical Resistance



Reinforced System

Performance Benefits

- ❑ All Mortar Benefits plus:
- ❑ Higher capacity to withstand thermal movement
- ❑ Improves system physical properties



Limitations

- ❑ Multi step installation process
- ❑ Reinforcement must be completely saturated and embedded
- ❑ Higher cost as reflected by labor



Standards for Physical Performance Properties

ASTM D4060 - Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

ASTM C307 - Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing

ASTM D412 - Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

ASTM D638 - Test Method for Tensile Properties of Plastics

ASTM C580 - Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes

ASTM C579 - Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes

ASTM D5045 - Test Methods for Plane-Strain Fracture Toughness and Strain Energy Release Rate of Plastic Materials

ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)

ASTM E96 - Test Methods for Water Vapor Transmission of Materials (Permeability)

ASTM D7234 - Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers

ASTM C531 - Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes

ASTM C884 - Test Method for Thermal Compatibility Between Concrete and an Epoxy-Resin Overlay

ASTM E1356 - Test Method for Assignment of the Glass Transition Temperatures by Differential Scanning Calorimetry

ASTM D4587 - Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings

Physical Properties Comparison

Polymer	Epoxy	Polyester	Vinyl Ester	Polyurethane/ Polyurea	Polysulfide
Physical Strength	High	High	High	Low to Medium	Low to Medium
Elongation	Low	Low	Low	Medium to High	Medium to High
Impact Resistance	Medium	Medium	Medium	Medium to High	Medium to High
Abrasion Resistance	Medium to High	Medium to High	Medium to High	Medium to High	Medium
Adhesion to Concrete	High	Medium	Medium	Medium	Medium
Cure Shrinkage	Low	High	High	Low	Low
Permeability	Low	Low	Low	Medium	Medium
UV Resistance	Low	Medium to High	Medium	Low to High	High
Creep	Low to Medium	Low to Medium	Low to Medium	High	High
Temperature Limit	Medium to High	Medium to High	Medium to High	Medium	Medium

Understanding the Need

Application Area

- Secondary Containment

Performance/Aesthetics

- Heavy chemical exposure
- Light foot & wheeled traffic

System Options

- Coatings
- Reinforced Systems
- Mortars



Secondary containment requirements are addressed by the Environmental Protection Agency (EPA) through the Resource Conservation and Recovery Act (RCRA) contained in title 40 of the Code of Federal Regulations (CFR) part 264, the 2006 Uniform Fire Code (UFC) in standard 60.3.2.8.3 and in the 2012 International Fire Code (IFC) in 5004.2.

The EPA refers to the need for secondary containment in two different areas: Subpart I, **Use and Management of Containers** (40 CFR 264.175), which covers portable storage containers, such as 55-gallon drums, for hazardous waste, and the second in Subpart J, **Tank Systems** (40 CFR 264.193), which covers large stationary containers, such as tank systems, for hazardous waste. Facilities that store hazardous materials may also be required to meet the either the UFC or IFC depending on what the locality has adopted.

Understanding the Need

Application Area

- Drum Storage
- Chemical Storage



Performance/Aesthetics

- Abrasion
- Impact Resistance
- Chemical Exposure

System Options

- Mortar Systems



Understanding the Need

Application Area

- Forklift Charging

Performance/Aesthetics

- Wheeled traffic
- Sulfuric Acid Exposure

System Options

- Self-Leveling Systems
- Mortars



Understanding the Need

Application Area

- Manufacturing

Performance/Aesthetics

- High Point Loading
- High Impact
- Potential Slip Resistance

System Options

- Mortars
- Self-Leveling Systems



Understanding the Need

Application Area

- Food Processing

Performance/Aesthetics

- Heavy Traffic
- Slip Resistance
- Organic Acid Exposure
- Steam Cleaning

System Options

- Mortars



Understanding the Need

Application Area

- Collection Centers

Performance/Aesthetics

- High Abrasion
- Assorted Chemical Exposure

System Options

- Iron Filled Mortar
- Iron Top Concrete



Understanding the Need

Application Area

- Parking Decks
- Garages

Performance/Aesthetics

- Pneumatic Tire Traffic
- Shear Forces on Turns
- Slip Resistance
- Hot Tire Pickup

System Options

- Traffic Deck Membrane and Wear Course
- High Build Textured Systems



Understanding the Need

Application Area

- Mineral Leaching
- Electrowinning
- Chemical Processing

Performance/Aesthetics

- Sulfuric Acid
- Organic Solvents
- Texture/slip resistance
- Wet environment

System Options

- Mortars
- Reinforced Systems
- Coatings under grates



Understanding the Need

Application Area

- Wastewater Treatment
- Water Treatment

Performance/Aesthetics

- Chlorides
- Sulfuric Acid

System Options

- High Build Resinous Flooring
- Coating (non-traffic)



SSPC Coating Specification No. 44

Liquid-Applied Organic Polymeric Coatings and Linings for Concrete Structures in Municipal Wastewater Facilities, Performance-Based

	Adhesion	Abrasion	WVT	Permeance	CLE	Absorption	Tensile	Exposure Duration
	ASTM D7234	ASTM D4060	ASTM D1653	ASTM E96	ASTM C531	ASTM C413	ASTM D2370/C307	ASTM D6943/C267
7. Chemical Storage	LS>200psi SS>300psi	<100 mg CS17 1Kg x1000 cycles	<2 g/m ² per 24hrs	<0.19 metric perms	<5.6 x 10 ⁻⁵ /F	<1.5% in 30 days after 7 day cure	N/A	72 hr Immersion (stored chemicals)
8. Secondary Containment	LS>200psi SS>300psi	<100 mg CS17 1Kg x1000 cycles	<2 g/m ² per 24hrs	<0.19 metric perms	<5.6 x 10 ⁻⁵ /F	<1.5% in 30 days after 7 day cure	>1000 psi	72 hr Immersion (containment)

Understanding the Need

Specialty Retail

- ❑ Paper & Pulp Industry

Performance/Aesthetics

- ❑ Chemical Exposure
- ❑ Wet Environment
- ❑ High Abrasion

System Options

- ❑ Mortar Systems
- ❑ Coatings under grates



Cost

Flooring and Installation Costs are secondary to the cost of failure.

- Employee Safety
- Production Disruption
- Asset protection

Factors Affecting Cost

- System Manufacturer
- Chemistry
- System Complexity
- Labor Requirement/Rate
- Square Footage
- Install Schedule

Specifying for Performance and Quality

1. Concrete

- Sub Grade
- Vapor Retarder
- Concrete Mix
 - Aggregates
 - Acid Resistance
 - Fly Ash
 - W/C <0.45
- Finish/Flatness/Pitch
- Curing Process
- Joints

2. Surface Preparation

- Surface Prep
- Inspection (soundness, contaminants, moisture)

3. Installation

- Certified Contractor + Material Manufacturer
- Mock-up & Approval
- Chemical Testing
- Trades Scheduling
- Install in climatized condition
- Material sampling, coupons, retains
- Protection

Division 3/7 Concrete and Joints

- ❑ **ACI 302.1R-15** Guide to Concrete Floor and Slab Construction
- ❑ **ACI 224.3R** Joints in Concrete Construction
- ❑ **ASTM C 33** Standard Specifications for Concrete Aggregates
- ❑ **ASTM E1745** Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
- ❑ **ASTM E1155** Standard Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers
- ❑ **ACI 308R** Guide to Curing Concrete
- ❑ **ASTM C920** Standard Specification for Elastomeric Joint Sealants
- ❑ **ACI 224.1R** Causes, Evaluation, and Repair of Cracks in Concrete Structures

Division 9 Flooring - Surface Preparation

- ❑ **Joint NACE Publication 02203/ICRI Technical Guideline 03741/SSPC-TR 5 Technical Committee Report:** “Design, Installation, and Maintenance of Protective Polymer Flooring Systems for Concrete”
- ✓ **NACE/SSPC Joint Surface Preparation Standard NACE No. 6/SSPC-SP 13** “Surface Preparation of Concrete”
- ❑ **ICRI Guideline No. 310.1R–2008** (formerly No. 03730) Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion
- ❑ **ICRI Guideline No. 310.2R–2013** Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair

Surface Preparation

Caution! The texture and appearance of the profile obtained will vary depending on the concrete strength, the

Material to be applied	Concrete Surface Profile									
	CSP 1	CSP 2	CSP 3	CSP 4	CSP 5	CSP 6	CSP 7	CSP 8	CSP 9	CSP 10
Sealers, 0 to 3 mils (0 to 0.075 mm)	■	■	■	■	■	■	■	■	■	■
Thin films, 4 to 10 mils (0.01 to 0.025 mm)	■	■	■	■	■	■	■	■	■	■
High-build coatings, 10 to 40 mils (0.025 to 1.0 mm)	■	■	■	■	■	■	■	■	■	■
Self-leveling toppings, 50 mils to 1/8 in. (1.2 to 3 mm)	■	■	■	■	■	■	■	■	■	■
Polymer overlays, 1/8 to 1/4 in. (3 to 6 mm)	■	■	■	■	■	■	■	■	■	■
Concrete overlays and repair materials, >1/4 in. (>6 mm)	■	■	■	■	■	■	■	■	■	■

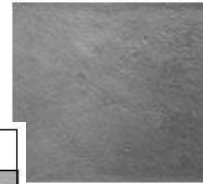


Fig. 6.1: CSP 1
(acid-etched)

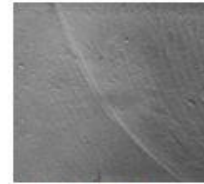


Fig. 6.2: CSP 2
(grinding)

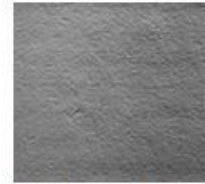


Fig. 6.3: CSP 3
(light shotblast)

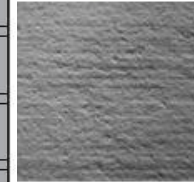


Fig. 6.4: CSP 4
(light scarification)

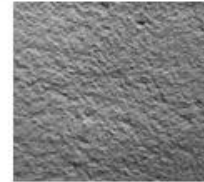


Fig. 6.5: CSP 5
(medium shotblast)

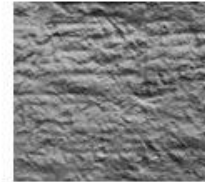


Fig. 6.6: CSP 6
(medium scarification)

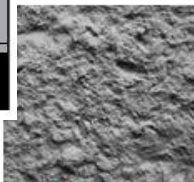


Fig. 6.7: CSP 7
(heavy abrasive blast)



Fig. 6.8: CSP 8
(scabbled)

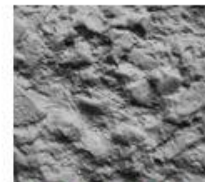


Fig. 6.9: CSP 9
(heavy scarification—
rotomilled)

Fig. 6.10: CSP 10
(handheld concrete
breaker followed by
abrasive blasting)

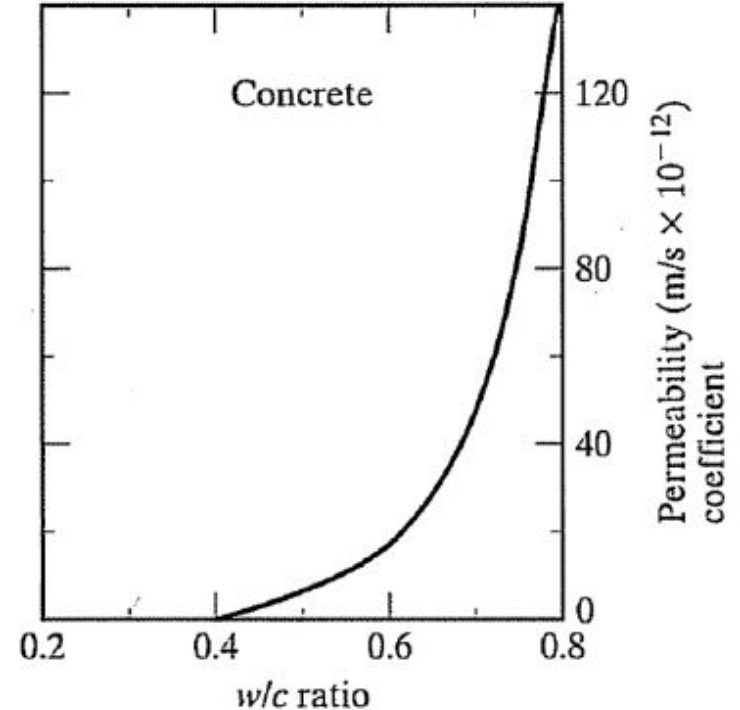
Surface Preparation

Minimum Acceptance Criteria for Concrete Surfaces After Surface Preparation NACE/SSPC Joint Surface Preparation Standard NACE No. 6/SSPC-SP 13

Property	Test Method	Light Service^(A)	Severe Service^(B)
Surface tensile strength	ASTM D7234	1.4 MPa (200 psi) min.	2.1 MPa (300 psi) min.
Surface tensile strength (C)	ASTM C1583	<u>1.4 MPa (200 psi) min.</u>	1.7 MPa (250psi) min.
Surface profile	ICRI No. 310.2	CSP 2 min.	CSP 3 min.
Surface cleanliness	ASTM D4258 (Visible dust)	No significant dust	No significant dust
Residual contaminants (D)	ASTM F21	Water droplets <u>will wet surface</u> immediately <u>forming</u> a continuous, uniform film	Water droplets <u>will wet surface</u> immediately <u>forming</u> a continuous uniform film
pH (acid etching)	ASTM D4262	(pH of rinse water) -1, +2 ^(E)	(F)

Division 9 Flooring - Moisture Testing

- ❑ **ASTM D4263** Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
- ❑ **ASTM F1869** Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
- ❑ **ASTM F2170** Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes



Division 9 Flooring - Installation

- ❑ **Joint NACE Publication 02203/ICRI Technical Guideline 03741/SSPC-TR 5 Technical Committee Report:** “Design, Installation, and Maintenance of Protective Polymer Flooring Systems for Concrete”
- **SSPC-TU 2/NACE 6G197** “Design, Installation, and Maintenance of Coating Systems for Concrete Used in Secondary Containment”
- ❑ **SSPC Guide 20** Guide for Applying Thick Film Coatings and Surfacing Over Concrete Floors
- ❑ **SSPC PA No. 7** Applying Thin Film Coatings to Concrete
- ❑ **SSPC TG NO. 12** Guide for Illumination of Industrial Coating Project
- ❑ **ACI 503R** Use of Epoxy Compounds with Concrete
- ✓ **Manufacturer's Installation Instructions**

Division 9 Flooring - Slip Resistance

- ❑ **ANSI A137.1** Standard Specification for Ceramic Tile (Slip Resistance-TCNA)
- ❑ **ANSI/NFSI B101.0** Walkway Surface Auditing Procedure for the Measurement of Walkway Slip Resistance
- ❑ **ANSI/NFSI B101.1** Test Method for Measuring Wet SCOF of Common Hard-Surface Floor Materials
- ❑ **ANSI/NFSI B101.2** Test Method for Determining the Impact on Wet Dynamic Coefficient of Friction of Various Chemical or Physical Walkway Surface Treatments
- ❑ **ANSI/NFSI B101.3** Test Method for Measuring Wet DCOF of Common Hard-Surface Floor Materials (Including Action and Limit Thresholds for the Suitable Assessment of the Measured Values)
- ❑ **ANSI/NFSI B101.4** Test Method for Measuring the Wet Barefoot Condition of Flooring Materials or Products
- ❑ **ANSI/NFSI B101.5** Standard Guide for Uniform Labeling Method for Identifying the Wet Static Coefficient of Friction (Traction) of Floor Coverings, Floor Coverings with Coatings, and Treated Floor Coverings
- ❑ **ANSI/NFSI B101.6** Standard Guide for Commercial Entrance Matting in Reducing Slips, Trips and Falls
- ❑ **ANSI/NFSI B101.7** Standard Test Method for Lab Measurement of Footwear Outsole Material Slip Resistance.
- ❑ **ANSI/NFSI B101.8** A Floor Safety Management Program for Slip, Trip, and Fall Prevention
- ❑ **ASTM D2047** Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine **(Lab)**
- ❑ **ASTM F609** Standard Test Method for Using a Horizontal Pull Slipmeter (HPS) **(Dry)**
- ⇒ **ASTM F1677** Standard Test Method for Using a Portable Inclined Articulated Strut Slip Tester (PIAST) **(W)**
- ⇒ **ASTM F1679** Standard Test Method for Using a Variable Incidence Tribometer (VIT) **(W)**
- ❑ **ASTM F2508** “Standard Practice for Validation, Calibration, and Certification of Walkway Tribometers Using Reference Surfaces”

Division 9 Flooring - Slip Resistance

Slip Resistant - the provision of adequate slip resistance to reduce the likelihood of slip for pedestrians using reasonable care on the walkway surface under expected use conditions.

Slip Resistance - the relative force that resists the tendency of the shoe or foot to slide along a walkway.



National Floor Safety Institute (NSFI)

Texture



Standard Guide for Concrete Coating Finish Texture*

Designation	Finish texture (Average Maximum Peak Heights) (mils)	Finish texture (Average Maximum Peak Heights) (microns)
CFT-A	2 - 6 mils	50 - 165 microns
CFT-B	7 - 18 mils	166 - 465 microns
CFT-C	19 - 30 mils	466 - 775 microns
CFT-D	31 - 50 mils	776 - 1270 microns



*Under Development

Details - Joints

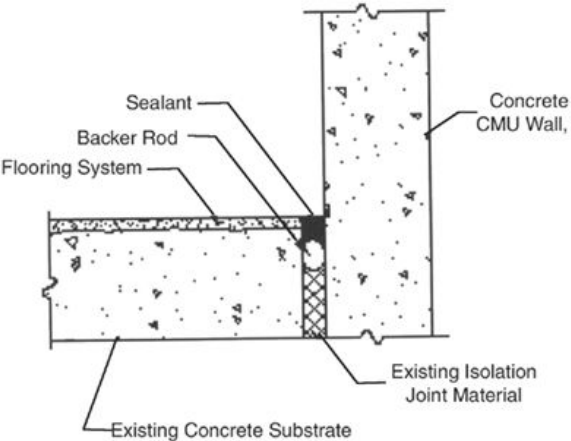
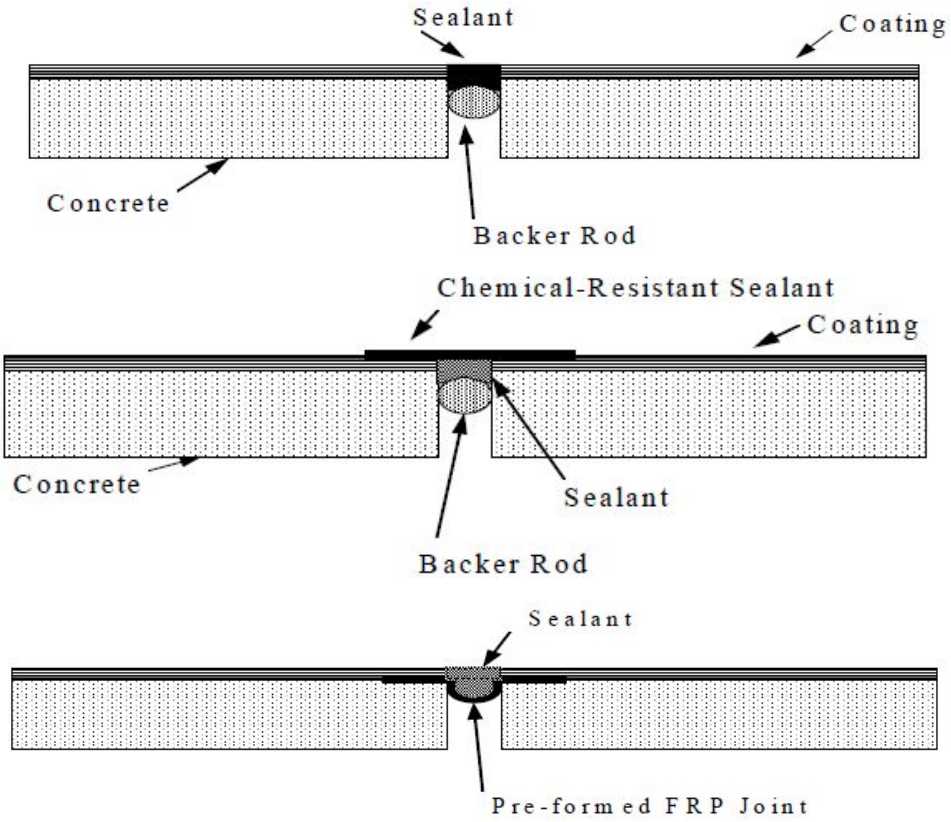
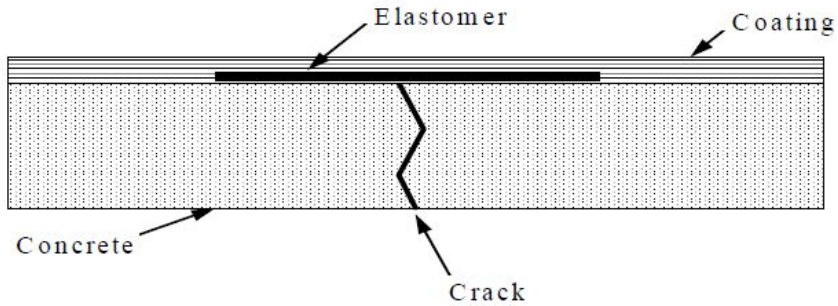
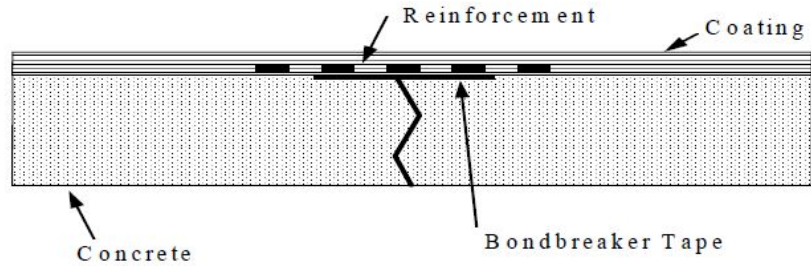


Figure 3: Isolation (Expansion) Joint at Floor/Wall Junction



Details - Joints (cover)



Details - Drains

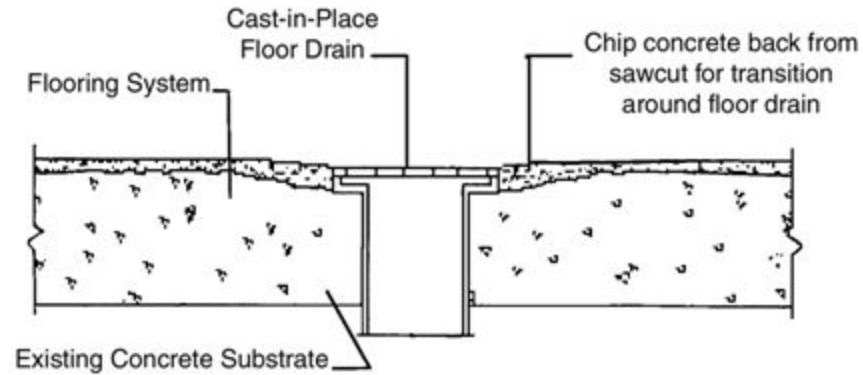


Figure 10: Floor Termination Design at Floor Drain

Details - Cove Base

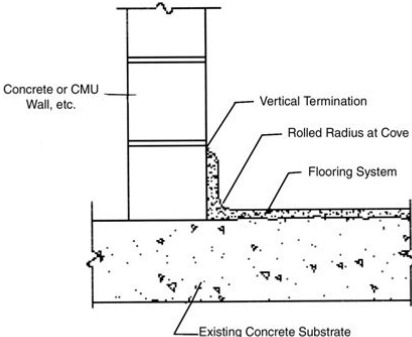


Figure 13: Rolled Radius Cove Base Detail

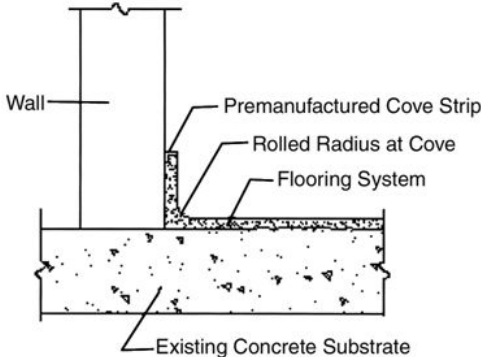


Figure 14: Cove Strip Cove Base Detail

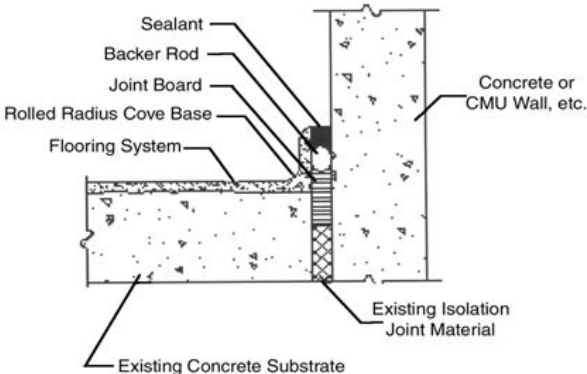


Figure 17: Isolation (Expansion) Joint and Cove Base Detail at Floor/Wall Junction

Installation Quality

1. **SSPC Guide for Planning Coatings Inspection**
2. **SSPC Monitoring and Controlling Ambient Conditions during Coating Operations**
3. **SSPC Development and Use of Quality Control Forms in Coatings Contracting**

- Limit Substitutions at bid stage
- Qualify Installer (Manufacturer or 3rd party - SSPC QP8)
- Single Sourced Systems
- Mockups
- Details
- General contractor meeting
- Independent testing -CCI (Hold Points) (SSPC QP5 or NACE III)
 - Surface Prep and Substrate Repairs
 - Moisture in Concrete
 - System Conformity (Materials, thickness, color)
 - Adhesion (Adhesion, Cohesion)
- Protection

Maintenance/Warranty

- ❑ Monitor High Wear and Traffic Areas
- ❑ Recommend: Multicolored systems to signal wear through
- ❑ Establish Chemical Spill Clean-up Procedures
- ❑ Establish Repair Procedures, especially in chemical exposure areas

Renovation/Renewal Considerations

In aggressive environments, it is expected the life of the system will be limited. Surface preparation and cleaning become critical to the performance for the new installation.

Summary

- ❑ Select a flooring system that will withstand the aggressive environment, then determine the installation conditions that must be met.
- ❑ Consider the requirements of each area of use independently. Consider combined chemical exposure, frequency, duration and temperature.
- ❑ A detailed specification is your roadmap to a successful installation.
- ❑ Qualify your installer based upon your system of choice.
- ❑ Quality installations start with the substrate.
- ❑ Plan, monitor and document the installation.

Additional Resources

- ❑ SSPC.org
- ❑ NACE.org
- ❑ NTMA.com
- ❑ ICRI.org
- ❑ [Concrete.org \(ACI\)](http://Concrete.org)
- ❑ NSFI.org
- ❑ 4Specs.com
- ❑ [Linkedin Groups](#)
 - ❑ [Epoxy Resinous Floors - Protective Coatings & Epoxy Systems](#)
 - ❑ [Resinous Flooring Professional](#)
 - ❑ [Seamless Flooring](#)

Questions?

Thank you for your attention.

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Recognition

- ❑ American Restore
- ❑ Corrosion Technology Systems
- ❑ Crossfield/Dex-o-Tex
- ❑ DeFelsko Corporation
- ❑ Durex Coverings, Inc.
- ❑ FloorChem, Inc.
- ❑ Florock Polymer Flooring/Crawford Laboratories, Inc.
- ❑ HP Spartacote/ LATICRETE International, Inc.
- ❑ International Concrete Repair Institute
- ❑ ITW PolySpec/Thiokol
- ❑ Key Resin Company
- ❑ National Floor Safety Institute
- ❑ Prime Coat Coating Systems
- ❑ Resdev Limited
- ❑ Scoons Contract Services
- ❑ Sherwin-Williams/General Polymers
- ❑ Sika Corp.
- ❑ Stonhard Group
- ❑ Surface Technology (UK)
- ❑ Techcoat Contractors, Inc.

Learning Objectives

1. Provide perspective with respect to aggressive environments and then review floor coating requirements to meet the performance demands.
2. Recognize the various polymeric chemistries available for flooring systems and what benefits they provide to the system installation and performance.
3. Review key guidance documents for the specification and detailing flooring systems for aggressive environments.
4. Understanding the importance of installation, inspection and maintenance considerations to the immediate and long term performance of the flooring system.