General Specification for Coating Concrete Floors with LiquaTile 1143

PART 1: GENERAL

1.0 GENERAL AND RELATED DOCUMENTS

1.01 The proper installation of a "Resinous Flooring System" requires the cooperation of many different parties. These parties may include the following or even more:

1.01.01 Facility (Decision Maker, May be Owner, Manager, or Representative)
1.01.02 Architect (Design Company)
1.01.03 Engineer (Design and Engineering Company)
1.01.04 Manufacturer (Manufacturer of Coatings Products)
1.01.05 Application Contractor (Coatings Application Contractor)
1.01.06 Coatings Inspector (Independent Coatings Inspector)

1.02 Detail drawings and layout plans shall be provided by Facility defining the work area, design, color placement, and other details for the project to the Application Contractor. All colors are to be approved by Facility before the project starts. The time line for all steps (work) to complete the project will be approved by Facility before any work begins to ensure the project can be complete in a timely manner to their schedule. Any delays in the project are a matter between the Application Contractor and Facility and in no way be any liability to Wolverine Coatings Corporation.

1.03 Application Contractor shall include a Quality Assurance Plan (QAP) detailing witness, hold and inspection points of the project.

1.04 Application Contractor shall include written work procedures including provisions for material storage and handling, surface preparation, environmental control, wall and floor joint detail, control and expansion joint detail, sequence of application, application methods, applicator qualification (NACE, SSPC, Journeyman, or Other), touch-up and repair methods, curing, and inspection of the coating system.

1.05 Application Contractor shall include cleaning and coating verification forms for daily inspection records.

1.06 The QAP submitted by the Application Contractor and approved by Facility shall be followed. The completed (QAP) when completely signed off shall be delivered to Facility and a copy of the (QAP) signed by the Application Contractor shall be delivered to Wolverine Coatings Corporation.

1.07 The Application Contractor shall ensure timely delivery so products will be available at project site when required for installation so as not to delay job progress.

1.08 Application Contractor shall store materials in accordance with **Wolverine Coatings Corporation's** recommendations. Storage site should be a dry, secure, and protected area in such a manner as to prevent damage. The temperature of the storage site should be maintained in accordance with product recommendations. Damaged or deteriorated materials shall be removed from the premises and not used.

1.09 Application Contractor (unless otherwise agreed upon by the parties to change) to deliver coating system materials to Facility job site in **Wolverine Coatings Corporation's** original, unopened containers, bearing **Wolverine Coatings Corporation's** name and label and the following information:

1.09.01 Product name
1.09.02 Product description
1.09.03 Batch number under which product was produced
1.09.04 Basic mixing instructions

1.10 Wolverine Coatings Corporation Related Documents

1.10.01 Epoxy Resin Systems Safe Handling Guide (TIB)
1.10.02 Preparing Concrete to Receive Coatings or Linings (TIB)
1.10.03 Basic Concrete Repair (TIB)
1.10.04 Treatment of Cracks and Joints (TIB)
1.10.05 Mixing Guide (TIB)
1.10.06 Video (VID) - Mixing Tutorial – Resinous Materials
1.10.07 Guide for Applying Polymer Coatings or Linings with Squeegee, Roller, and Brush (TIB)
1.10.08 All Detail Drawings (TDD)

PART 2: SCOPE

2.0 SCOPE – PROJECT

2.01 This specification covers the basic requirements for surface preparation and application of a **Wolverine Coatings Corporation "Resinous Flooring System"** on a concrete surface.

PART 3: INTENT

3.0 INTENT

3.01 The intent of this specification is to provide directions and guidance to help ensure the proper and complete installation of a **Wolverine Coatings Corporation "Resinous Flooring System".** It is also the intent of this specification to provide basic information on surface preparation, and on application of the products in question. It is not intended to be an exhaustive specification to include all work and material necessary for

completion of the work. An incidental item of material, labor, or detail required for the proper execution or completion of the work and omitted from this specification, but obviously required by governing codes, local regulations, trade practices, operational functions, and good workmanship (both skill and latest published industry standard practices) shall be provided as part of the contract work, even though not specifically detailed or mentioned in this specification.

3.02 The Application Contractor's proposal (bid) should be based upon this specification and the technical information provided by **Wolverine Coatings Corporation's** most current Technical Data Sheets (TDS) for the specified materials, Technical Data Bulletins (TIB), and Technical Detail Drawings (TDD). It is also assumed, and the responsibility of the Facility to determine, that all persons installing coating systems such as these have the required background, technical knowledge and equipment to perform said tasks in a satisfactory manner and in accordance with SSPC "Good Painting Practices" Vol. 1, 4th edition, SSPC-10 (Procedures for applying thick film coatings and surfacing over concrete floors), SSPC-TR 5/ ICRI Technical Guideline 03741 / NACE 02203 (Design, Installation, and maintenance of protective polymer flooring for concrete) and or NACE "Recommended Practices".

PART 4: MATERIALS

4.0 MATERIALS

4.01 1st Coat (Primer Coat) **BondTite 1101** by **Wolverine Coatings Corporation** applied at a rate of 8.0-12.0 mils wet (100% Solids AHC Fluoro-Polymer Modified Epoxy).

4.02 Joint and Crack Filling- **IntegraFlex 1921** by **Wolverine Coatings Corporation** Flexible Joint Sealant 100% solids two-component polymer.

4.03 Small Divot Repair- **FlashPatch 1221** (preferred) or make a mixture of **BondTite 1101** by **Wolverine Coatings Corporation** mixed with 200nm Fumed Silica for small areas no larger than the size of a quarter and not deeper than 1/8". Create a mix in consistency of peanut butter and applied by a steel blade (putty knife or trowel) in a manner to force mixture into bottom of divots and leveling with the surface of the prepared concrete surface.

4.04 Spall Repairs- Areas larger than the size of a quarter and/or deeper than 1/8" shall be filled with TrowelEase 1162 mortar (preferred) or a mixture of **BondTite 1101** by **Wolverine Coatings Corporation** mixed with clean silica sand at a rate to create a mix in consistency of a mortar and applied by a steel blade (putty knife or trowel) in a manner to force mixture into bottom of spalled areas or divots and leveling with the surface of the prepared concrete surface. A trowel lubricant, such as ethanol or other suitable material, can be used to smooth the patch.

4.05 2nd Coat (Finish Coat) **LiquaTile 1143** by **Wolverine Coatings Corporation** applied at a rate of 28.0-32.0 mils wet (100% Solids Chemically Fused Liquid Ceramic).

PART 5: EXECUTION

5.0 EXECUTION

5.01 Substrate Conditions: The Application Contractor shall test the concrete properties and report any areas which are unsuitable for coating.

5.02 Facility shall ensure any new concrete shall have the following properties:

- Minimum compressive strength of 3000 psi.
- Minimum surface tensile strength of 250 psi.
- No curing component, form release agents, or other contamination shall be present on the surface.
- A waterproofing vapor barrier is required below concrete.
- Finish shall be steel or wood toweled once over lightly.
- Minimum 28-day cure at 75˚F (24˚C) prior to coating application. Contact **Wolverine Coatings Corporation's** Technical Department prior to concrete placement (pour) for specific recommendations for any fast track project that will not allow proper cure.
- Floor flatness tolerance as determined by ASTM E 1155, "Standard Method for Determining Floor Flatness and Levelness Using the F-Number System", should have a minimum FF of 30, 3/16 inch as determined by the 10 ft. straight edge method. (ACI 117 gives information on both systems.)
- Expansion joints shall be of non-asphalt type.
- Concrete shall be finished to grade of desired finished floor.

PART 6: SUBSTRATE PREPARATION

6.0 PREPARATION OF CONCRETE SUBSTRATE

6.01 Contaminated concrete shall be cleaned and prepared to remove contaminants, existing coatings, week surface layers, laitance, dust, or debris by an effective and appropriate method.

6.02 A representative trial area acceptable to all parties shall be prepared and used as a standard. Facility may choose to make this optional.

6.03 Mask off adjoining surfaces not to receive fluid-applied coatings to effectively prevent spillage or overspray of liquid materials outside coating area.

6.04 Concrete Surfaces designated for coating system shall be prepared by removal of all oil, grease, dirt, debris, water or other contaminates in accordance with ASTM D 4258 AND SSPC-SP 1.

6.05 Abrasive grit blast, diamond grind all surfaces to be coated, to remove all laitance, efflorescence with SSPC-SP 12 / NACE No. 6 or ASTM D 4259. Concrete surfaces prepared should have a minimum profiled surface that equates to the industry standard table values below.

Resinous Floor Topping/Overlay Thickness	ICRI Surface Profile Number
0 - 3 mils	CSP 1 – 3
4 - 10 mils	CSP 1 – 3
10 - 40 mils	CSP 3 – 5
50 mils – 1/8"	CSP 4 – 6
1/8" – 1"	CSP 5 – 9

6.06 Compressed Air & Abrasives

6.06.01 If compressed air is used, the compressed air supply shall be completely free of all oil, water and other contaminates and provide the required volume of air at 100 psi or greater.

6.06.02 Abrasives used shall be clean, a uniform grade and of an appropriate size to obtain the specified surface finish and profile. Do not use contaminated abrasive.

6.07 Thoroughly clean all prepared blasted surfaces to remove all dust and debris after dry blasting, or diamond grinding.

6.08 Repair and remove or fill cracks, voids, honeycombs, fins and other surface irregularities using a recommended patching material **FlashPatch 1221**, **BondTite 1101 mixture with 200nm Fumed Silica,** or **IntegraFlex 1921** (see section 4) by Wolverine Coatings Corporation.

6.09 Grind all form ties or other metallic protrusions below the surface and then patch or fill with appropriate materials **(see section 4)** by Wolverine Coatings Corporation.

6.10 All expansion joints and moving cracks which have opened to a width of 1/16" (1.6mm) or greater must be repaired with **IntegraFlex 1921** by Wolverine Coatings Corporation.

6.11 Immediately prior to application of the concrete primer (1st Coat), thoroughly vacuum clean all surfaces to be coated effectively removing all remaining dust.

6.11.01 Vacuum cleaning a roughened concrete surface is the only known effective method of removing dust from deep pits, cracks, crevices, bug holes, etc. and is considered a mandatory procedure.

PART 7: INSPECTION / TESTING / QUALITY ASSURANCE

7.0 INSPECTION / TESTING / QUALITY ASSURANCE

7.01 If the representative trial area mentioned in Section 6 was installed it shall be used as a standard.

7.02 Surface strength shall be tested after surface preparation by using a "pull-off" type adhesion tester such as the Elcometer Model 106 or German Instruments adhesion tester with a minimum 0-1000 psi. Frequency of tests performed shall be determined by Facility.

7.03 An approved moisture test must be performed prior to coating as no warranty is given in cases of failure caused by moisture (or MVT) in the substrate. Consult **Wolverine Coatings Corporation** for approval of specific tests.

7.04 For coatings which are rated as water tight (such as primary or secondary chemical containment areas), before completed coatings on horizontal surfaces are covered by protection or other work, test for leaks with 2-inch depth of water, to which a suitable dye may be added if necessary, maintained for 24 hours. Repair any leaks revealed by examination of substructure, and repeat test until no leakage is observed.

7.05 Remove all oil, grease, and dirt. Water or other contaminates in accordance with ASTM D 4258 and SSPC-SP 1.

7.06 Facility, Architect, Engineer, Manufacturer, Application Contractor, and Coatings Inspector shall be allowed free access to inspect All work in progress. Any work not conforming to the specification or not meeting the approval of the Facility, Architect, Engineer, Manufacturer, or Coatings Inspector shall be removed or corrected and / or reinstalled at no extra cost.

7.07 It will be the Application Contractor's responsibility to perform first line inspection of all aspects of the surface preparation and coating application work and to assure conformance with all pertinent specifications. The Application Contractor's supervisor shall not participate in the physical work, but should limit his activities to supervision, coordination and communication with the Owner's site personnel and to thoroughly inspect the surface preparation and coating installation work.

7.08 All pot lives (or gel times), re-coat and cure times are based on laboratory conditions and quantities (typically 72˚F and 50% RH). Higher or lower temperatures, humidity, or volume of mixed materials can dramatically affect these properties, so be aware of the application conditions.

7.09 Film Thickness Measurement: It is possible to check the application of successive coats, in accordance with SSPC-PA 2, SSPC-PA9 (Measurement of dry organic coatings thickness on cementitious substrates using ultrasonic gages). However, very few contractors have this equipment. Wet Film Thickness can be calculated by examining the amount of product used (gallons) over the known area (ft^2). It is also wise to periodically check wet film thickness during application using a wet film thickness gauge.

7.10 Film Thickness Requirements

7.10.01 The **BondTite 1101** by **Wolverine Coatings Corporation** shall have a (DFT) dry film thickness no less than 8.0-12.0 mils

7.10.02 The **LiquaTile 1143** by **Wolverine Coatings Corporation** shall have a (DFT) dry film thickness no less than 28.0-32.0 mils

7.11 System:

1. Primer: 100% Solids AHC Fluoro-Polymer Modified Epoxy
2. Joint Repair: 100% Solids Flexible Hybrid Polymer
3. Small Surface Repair: 100% Solids Hybrid Polymer Fast Setting Repair
4. Large Surface Repair: 100% Solids Flexible Epoxy Patching Mortar
5. Top Coat: 100% Solids Chemically Fused Liquid Ceramic

Product	Generic Type	Estimated 1 Gal. Coverage Wet
BondTite 1101	100% Solids AHC Fluoro-Polymer Modified Epoxy	160 Sq. Ft. @ 10.0 mils
IntegraFlex 1921	100% Solids Flexible Hybrid Polymer	As needed
FlashPatch 1221	100% Solids Hybrid Polymer Fast Setting Repair	As Needed
TrowelEase 1162PK	100% Solids Flexible Epoxy Patching Mortar	As Needed
LiquaTile 1143	100% Solids Chemically Fused Liquid Ceramic	53 Sq. Ft. @ 30.0 mils

Bids are to be based on the specified coatings and colors. ALL materials used on this job must be manufactured or approved by Wolverine Coatings Corporation.

PART 8: APPLICATION METHODS

8.0 APPLICATION METHODS

8.01 All materials that are applied shall be applied as per this **Wolverine Coatings Corporation** Specification, (TDS) Technical Data Sheet for each material, (TIB) Technical Information Bulletins, and (TDD) Technical Detail Drawings. NO EXCEPTIONS ALLOWED. If you have a question you shall contact **Wolverine Coatings Corporation's** technical department for assistance. No work shall be carried forward until the question is resolved and fully understood by All parties.

8.02 It is important and worth stressing to double check for proper preparation including preparation of substrate, detail drawings of joints and planar changes in substrate, and proper priming of substrates.

8.03 Below or at grade concrete walls and slabs that will be internally lined or coated must have a sheet or plastic vapor barrier installed on the unprotected side of the concrete. To minimize outgassing problems all coatings should be applied when the surface temperature of the concrete is declining.

8.04 Materials shall be applied to produce a uniform monolithic wearing surface within specified thickness tolerances, uninterrupted except at divider strips, saw joints or other types of joints, if any, indicated or required.

8.05 If the trial area mentioned above was completed then the final finish shall match the trial area finish. Regardless, the final finish should be free from visible defects such as unevenness, inclusions, patchiness, wrinkles, streaks, roller streaks, roller hairs or other trash, squeegee or float marks or dry spray patterns.

8.06 Mix separately packaged components in accordance with **Wolverine Coatings Corporation's** written and video recommendations and minimize inclusion of air during mixing.

8.07 Apply coatings material to substrate and adjoining surfaces indicated to receive coating. Apply in accordance with **Wolverine Coatings Corporation** recommendations to obtain thickness specified and using applicators and techniques best suited for slope and type substrate to which applied.

8.08 Permit coating to cure under conditions that will not contaminate or deteriorate material. Block off traffic and protect coating from physical damage.

8.09 Detailing shall be done at all moving cracks and joints to prevent cracking of the flooring. (See **Wolverine Coatings Corporation** Technical Detail Drawings)

8.10 Working cracks, expansion joints, and control joints shall be detailed in one of the following ways:

8.10.01 Keying and installation of non-reinforced flexible joint compound.
8.10.02 Keying and installation of metal reinforcing mesh and the specified flooring resins and aggregates.

8.11 Due to the inconsistent nature of concrete, surface porosity can vary greatly. A primer should always be used to reduce the occurrence of outgassing and pinholes. Extreme cases of surface porosity may require multiple coats of primer. Application Contractor should bring any suspected extreme porosity to the attention of the Facility immediately.

PART 9: HEALTH AND SAFETY

9.0 HEALTH AND SAFETY

9.01 (All parties) Read **Wolverine Coatings Corporation** Safety Data Sheets (SDS) and container labels of the materials being used for detailed health and safety information. Be sure All workers have a full understanding of the health and safety information before any work begins.

9.02 The Application Contractor will establish the number of air exchanges per hour required to maintain a safe working atmosphere during all phases of work. The Application Contractor will include details of his safety program for the project in his bid.

9.03 All abrasive blasters, all applicators and their helpers will wear appropriate respiratory protection equipment. The type of respiratory protection will depend upon the nature of the application and material hazard, and shall eliminate dust, fumes, mists, organic vapors, acids and alkaline contaminates.

9.04 The Application Contractor must comply with all Federal, State, Local, and Facility regulations pertaining to safety, environmental protection and other regulations in order to meet the strictest governed requirements, SSPC-PA10 (Guide to safety and health requirements for industrial painting projects).

PART 10: REFERENCE STANDARDS

REFERENCES & STANDARDS:

1. **ACI: American Concrete Institute**
   38800 Country Club Drive
   Farmington Hills, MI 48331 USA
   Phone: (248) 848-3700
   www.aci.org

2. **ASTM International: American Society for Testing and Materials**
   100 Barr Harbor Drive
   PO Box C700
   West Conshohocken, PA USA 19428-2959
   Phone: (610) 832-9500
   www.astm.org

3. **ICRI: International Concrete Repair Institute**
   3166 S. River Road, Suite 132
   Des Plaines, IL USA 60018
   Phone: (847) 827-0830
   www.icri.org

4. **NACE International: National Association of Corrosion Engineers**
   1440 South Creek Drive
   Houston, TX USA 77084-4906
   Phone: (281) 228-6200

www.nace.org

5. **SSPC: The Society for Protective Coatings**
   40 24th Street, 6th Floor
   Pittsburgh, PA USA 15222-4656
   Phone: (412) 281-2331
   www.sspc.org

6. **Wolverine Coatings Corporation**
   5969 Highway 221
   Roebuck, SC USA 29376
   Phone: (864) 587-3144
   www.wolverinecoatings.com