

# STONGARD TM GUIDE SPEC

 **SECTION 096723 - RESINOUS FLOORING**

* + - 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
1. Definitions: Elastomeric polyurea-polyurethane lining includes a penetrating, two-component, epoxy primer and a spray applied, high build, polyurea-polyurethane elastomeric coating.
2. Related Work
3. Division 3 Section Cast in Place Concrete
4. Division 7 Section Thermal and Moisture Protection

If allowance or unit price applies to Work of this Section, insert brief paragraph here to alert Contractor and reference appropriate Division 01 Section for specific details. If concrete substrates exhibit unacceptable moisture-vapor-emission rates, allowance or unit price can be used to plan for or control the costs of remedial procedures. See "Moisture and Flooring Failures" Article in the Evaluations.

* + - 1. SUBMITTALS
				1. Product Data: Submit manufacturer's technical data, installation instructions, and chemical resistance data for the elastomeric polymer lining. Include certification indicating compliance of materials with requirements.

Insert requirements for Shop Drawings if special color patterns are required.

Delete paragraph above if colors and other characteristics are preselected and specified or scheduled. Retain paragraph below with or without above.

* + - * 1. Samples for Verification: Submit, for verification purposes, 5-inch square samples of each type of elastomeric polyurea lining required, applied to a rigid backing, in color and finish indicated.

Delete paragraph below if not required.

* + - * 1. Product Schedule: Use special coatings designations indicated in Part 2 and room designations indicated on Drawings in product schedule.

Retain first paragraph below if Installer certification is required in "Quality Assurance" Article.

* + - * 1. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
			1. QUALITY ASSURANCE
				1. No request for substitution shall be considered that would change the generic type of specialty coating system specified (i.e. spray applied, high build, polyurea-polyurethane elastomeric coating). Equivalent materials of other manufactures may be substituted only on approval of Architect or Engineer. Request for substitution will only be considered only if submitted 10 days prior to bid date. Request will be subject to specification requirements described in this section.
				2. Installer Qualifications: Engage an experienced installer (applicator) who is experienced in applying systems similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and who is acceptable to special coatings manufacturer.

Retain subparagraph above or below if available for products selected; see "Installer Qualifications" Article in the Evaluations. Retain below with requirements for Installer certificates in "Submittals" Article.

Engage an installer who is certified in writing by special coatings manufacturer as qualified to apply specialty coating systems indicated.

Contractor shall have completed at least 5 projects of similar size and complexity.

* + - * 1. Source Limitations: Obtain primary materials, including primers, resins, hardening agents, grouting coats, and topcoats, through one source from a single manufacturer, with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.
				2. Manufacturer Field Technical Service Representatives: Resinous flooring manufacture shall retain the services of Field Technical Service Representatives who are trained specifically on installing the system to be used on the project.

Field Technical Services Representatives shall be employed by the system manufacture to assist in the quality assurance and quality control process of the installation and shall be available to perform field problem solving issues with the installer.

Revise paragraph below to suit Project or delete if unnecessary.

Delete paragraph and subparagraphs below if not required. If retaining, indicate location, size, and other details of mockups on Drawings or by inserts. Revise wording if only one mockup is required.

* + - * 1. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - * 1. Pre-installation Conference:

General contractor shall arrange a meeting not less than thirty days prior to starting work.

Attendance:

General Contractor

Architect/Owner's Representative.

Manufacturer/Representative.

If required by authorities having jurisdiction or Owner, insert fire-test-response-characteristic requirements to suit Project. See "Fire-Test-Response Characteristics" Article in the Evaluations.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.
				2. Store materials to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects. Store material per product data sheet.
			2. PROJECT CONDITIONS
				1. Concrete substrate shall be dense, free of voids, fins, honeycombs and other imperfections. Horizontal surfaces shall have a “once over” steel trowel finish (wood float, broom or machine trowel finishes are unacceptable). Finish concrete to the required grade, less allowance for overlayment thickness. A vapor barrier shall be present for concrete on or below grade to prevent osmotic pressure forces from affecting adhesion of overlayment. Cure concrete and conduct the following tests prior to application of overlayment:

Test for “bird baths,” if complete drainage is critical, by flooding horizontal surfaces with water and marking unacceptable areas. Unacceptable areas are to be corrected prior to application of overlayment.

Test for unacceptable moisture content in concrete by the “plastic sheet” method (Ref. ASTM D-4263). The number of test sites shall be representative of the scope of work.

Test for acceptable concrete surface tensile strength of 200 psi minimum by using a “pull-out test” (Ref. ASTM D-7234) in which a 1.0 inch diameter hole is cut into the concrete. Using a polymer adhesive, glue a 0.8 inch diameter dolly to the area cut in the concrete. The number of test sites shall be representative of the scope of work.

All patching and repair materials must be compatible with the overlayment and must be tested for acceptable surface tensile strength of 200 psi minimum by using “pull-out test” (Ref. A.3. above). The number of test sites shall be representative of the scope of work.

Test for substrate temperature by using a surface dial thermometer or equal. Temperature shall be within temperature parameters recommended by the lining material manufacturer.

Inspect for contamination, such as oil, grease, or chemical spills. Contamination must be removed prior to application of lining.

* + - * 1. Utilities, including electric, water, and finished lighting to be supplied by General Contractor.
				2. Job area to be free of other trades during, and for a period of 8 hours, after lining installation.
				3. Protection of finished lining from damage by subsequent trades shall be the responsibility of the General Contractor.

1.7 WARRANTY

* + - * 1. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of (1) full years from date of installation, or provide a joint and several warranty signed on a single document by material manufacturer and applicator jointly and severally warranting the materials and workmanship for a period of (1) full year from date of installation. A sample warranty letter must be included with bid package or bid may be disqualified.

If a special warranty is required, insert "Warranty" Article. Requiring a single-source warranty for application and materials from the manufacturer may ensure quality but will eliminate some manufacturers. Alternatively, a special warranty signed by the Installer and manufacturer can be required.

1. **PRODUCTS**

Copy Article below and re-edit it for each resinous flooring system required. Insert number to complete drawing designation for each system required. Use these designations on Drawings to show where each system is required.

* + - 1. SPECIAL COATINGS

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products.

* + - * 1. Available Products: elastomeric polyurea-polyurethane traffic bearing lining system. Subject to compliance with requirements, products that may be incorporated into the Work include,

Retain above for nonproprietary or below for semiproprietary specification. Refer to Division 01 Section "Product Requirements."

* + - * 1. Products: Subject to compliance with requirements:

Stonhard, Inc.; Stongard® TM.

* + - * 1. System Characteristics:

Color and Pattern: 12 Standard Colors.

Wearing Surface: Textured.

Overall System Thickness: 50 to 80 mils

Revise subparagraph below to suit Project or delete if unnecessary.

* + - * 1. System Components: Manufacturer's standard components that are compatible with each other and as follows:

Primer:

Delete first subparagraph below if unnecessary.

Material Basis: Stonhard Stonchem Epoxy Primer

Resin: Epoxy

Formulation Description: (2) two component 100 percent solids.

Application Method: Squeegee and roller.

Number of Coats: (2) two.

Filler: Patch and fill bug holes in conjunction with primer.

Traffic bearing lining:

Material design basis: Stongard TM

Resin: Polyurea-polyurethane elastomeric.

Delete first subparagraph below if unnecessary.

Formulation Description: High build material formed by reacting an amine and hydroxyl terminated resin with an isocyanate.

Application Method: Spray or squeegee and roller applied, provisions in part 3.

Thickness of Coats: 45 to 75 mils

Number of Coats: 1

Texture

Material Design Basis: Stonhard Medium Texture or Texture 6

Material: Silica or Aluminum Oxide

Product Description: Angular Anti Slip Texture

Application Method: Broadcast, provision in part 3

Retain subparagraph below if primer is required. Some systems are self-priming. Some manufacturers offer optional primers.

Various topcoat options are available for resinous flooring systems. Revise first subparagraph below to suit Project.

Top coat:

Material design basis: Stongard top coat

Resin: polyurethane.

Delete first subparagraph below if unnecessary.

Formulation Description: Aliphatic polyurethane.

Type: pigmented.

Finish: standard.

Number of Coats: one.

Note: Components listed above are the basis of design intent, all bids will be compared to this standard including resin chemistry, color, wearing surface, thickness, and installation procedures, including number of coats. Contractor shall be required to comply with all the requirements of the Specifications and all of the components required by the Specifications, whether or not such products are specifically listed above.

* + - * 1. The polyurea-polyurethane elastomer shall be formed by reacting an amine and hydroxyl terminated resin with an isocyanate. The reacted polyurea-polyurethane elastomer shall have the following application properties.

Gel Time 1 hour

Cured for foot traffic 5 hours

Delete paragraph and subparagraphs below for proprietary or semiproprietary specification where product designations establish criteria for physical properties. If retaining and specific criteria are required for each component coat of the system, revise to suit Project.

* + - * 1. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

Subparagraphs below are examples only and are based on test methods required in ASTM C 722 and manufacturers' literature. Manufacturers' testing procedures differ; revise test methods indicated and insert additional requirements to suit Project.

Tensile Strength: 2,700 psi per ASTM D 638.

Elongation: 125% per ASTM D 638

Abrasion Resistance: 0.035 gm maximum weight loss per ASTM D 4060.

Low Temperature Flexibility Test: -20oF/-29oC Pass per ASTM D 522.

If necessary, insert requirements for metal or plastic cove caps for integral cove base or other materials required for resinous flooring systems selected.

1. **EXECUTION**
	* + 1. HAND APPLICATION
				1. Material shall be mixed at 2 parts polyol to1 part isocyanate on a volumetric basis using the following pieces of equipment:

Graduate portioning containers

Jiffy mixer and drill

5 gallon buckets

15 mil notched squeegee

Nap rollers

Stonhard Spraycaster

Heating bands based on availability

* + - 1. SPRAY EQUIPMENT
				1. The type and condition of the spray equipment is critical to produce a high quality polyurea-polyurethane lining with the proper physical properties. Use of any spray equipment which does not comply with this section of the specification is strictly prohibited without the written approval of an authorized technical representative.
				2. Spray pump and heating unit shall be WIWA Duo Mix 230, as manufactured by WIWA Wilhelm Wagner LP, 3734A Cook Blvd, Chesapeake, VA 23323, (757) 436-2223. Other manufacturer models may be acceptable for specific projects subject to written approval by the Stonhard Technical Service Department.
				3. Spray gun shall be a WIWA 500F Airless as manufactured by WIWA Wilhelm Wagner LP.
				4. Spray gun shall have one port of entry for the mixed two-component lining system. The spray gun shall be fed by a ¼” swiveling WHIP hose that contains mixed material.
			2. ADDITIONAL REQUIREMENTS
				1. Drum heaters are required to heat material if material temperature is below 65oF/18oC.
				2. The following minimum services shall be provided to run the spray equipment and heaters:

Electric: Single phase, 110 or 220 volt

Compressed Air: 185 CFM @ 90 psi, treated to assure dry air supply.

* + - 1. PREPARATION
				1. Substrate: Concrete preparation shall be by mechanical means and may include use of a scabbler, scarifier, shot blast, sand blast, water blast or sand injected water blast machine for removal of bond inhibiting materials such as curing compounds or laitance. Outside corners shall be ground to remove sharp corners. Route all cracks and joints to form a “V” groove.
				2. Surrounding steel preparation shall be abrasive blasted to near white metal, according to SSPC-SP10.
			2. APPLICATION
				1. General: Apply each component of elastomeric polyurea-polyurethane lining system in compliance with manufacturer's directions to produce a uniform monolithic lining of the thickness indicated.
				2. Primer: Mix and apply primer over properly prepared substrate with strict adherence to manufacturer's installation procedures and coverage rates.
				3. Bug Hole Filler: Mix and apply bug hole filler as part of the priming in strict accordance with manufacturer’s installation procedure.
				4. Inside Radius: Mix and apply radius filler material forming a minimum ½” radius in strict accordance with manufacturer’s installation procedures.
				5. Cracks & Joints: Fill all cracks and joints with compatible elastomeric filler material in strict accordance with manufacturer’s instructions.
				6. Lining: Spray apply elastomeric polyurea-polyurethane lining at a 2:1 ratio over properly cured primer with strict adherence to manufacturer’s installation procedures including but not limited to:

Primary Heat: 90 - 100°F/°C

Hose Heat: 125°F/°C

Spray Pressure: 2,000 – 2,300 psi with no greater than 300 psi pressure differential between sides.

* + - * 1. Lining: Drill mix and squeegee and roller apply elastomeric polyurea-polyurethane lining at a 2:1 ratio over properly cured primer with strict adherence to manufacturer’s installation procedures including but not limited to:

Pre mix the polyol

Mix 2 parts polyol with 1 part isocyanate

Mix heated material (90 – 100oF) for 60 seconds and 90 seconds for unheated material

Apply the desired amount of material on the substrate.

* + - 1. ENGINEERING DETAILS
				1. Points of Termination:

Edges shall be chased to “lock” the lining into the concrete.

Tank perimeters shall be treated in one of three methods as specified by the Owner prior to bid:

Lining shall terminate at tank perimeter without sealing perimeter edge, to allow detection of leaks that may occur under the tank.

Lining shall terminate at tank perimeter with a compatible elastomer sealing the interface between the lining and the tank.

Lining shall lap and seal onto the perimeter of the tank by bridging over compatible elastomer at the tank/slab interface to compensate for possible movement.

Equipment support legs shall be treated in one of the two methods described in 2.b. or 2.c. above as specified by the Owner prior to bid.

Trench drains shall be treated in one of three methods as specified by the Owner prior to bid:

Steel angle trench lip must be anchored to prevent movement between the steel and concrete. Lining shall be chased to “lock” the lining where it terminates at the angle. Steel angle will be coated with the lining system or a material compatible with the lining material or will remain uncoated at Owner’s option.

Prefabricated polymer or alloy trenches must be anchored to prevent movement between the concrete and trench. Lining shall be chased to “lock” the lining where it terminates at the trench.

Concrete trench will be lined to maintain monolithic protection. “Cold Joint” will be treated by lining manufacturer to assure bridging of potential cracks.

Pipe drains shall be treated by chasing the lining to “lock” in place at point of termination. Pipe drain must be anchored to prevent movement between concrete and trench.

Pipe chases shall be treated by having the lining lap and seal onto the perimeter of the pipe chase.

* + - * 1. Joints and Cracks:

Control joints shall be treated by lining manufacturer to assure bridging of potential cracks and to maintain monolithic protection.

Cold joints or construction joints shall be treated by lining manufacturers to assure bridging potential cracks and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.

Vertical and horizontal expansion/contraction joints shall be treated by installing backer rod and compatible sealant before lining is installed to assure bridging of joint movement and to maintain monolithic protection.

Cracks in vertical or horizontal concrete substrates shall be treated by lining manufacturer to assure bridging of cracks and to maintain monolithic protection.

* + - * 1. Corners:

Inside corners shall be treated with either an elastomeric or epoxy mortar radius (½” minimum) prior to application of the lining.

Outside corners shall be ground to remove sharp corners as part of surface preparation.

* + - 1. FIELD QUALITY CONTROL
				1. The right is reserved to invoke the following material testing procedure at any time, and any number of times during period of lining application.
				2. The Owner will engage service of an independent testing laboratory to sample materials being used on the job site. Samples of material will be taken, identified and sealed, and certified in presence of Contractor.
				3. Testing laboratory will perform tests for any of the characteristics specified, using applicable testing procedures referenced herein, or if none are referenced, in manufacturer's product data.
				4. If test results show materials being used do not comply with specified requirements, Contractor may be directed by Owner to stop work; remove non-complying materials; pay for testing; reapply lining materials to properly prepared surfaces which had previously been coated with unacceptable materials.
				5. Thickness Test: Apply polyurea-polyurethane lining material onto a polyethylene board with the number of spray gun passes to be used during installation. After the material cures for a few minutes, remove the material from the board and measure thickness. If thickness is not within the nominal specified range, adjust number of spray gun passes and repeat test.
				6. Retained Field Samples: Return field samples used for thickness test to lining manufacturer, who shall retain samples as part of the manufacturer’s project record.
			2. CURING, PROTECTION AND CLEANING
				1. Cure elastomeric polyurea-polyurethane lining system in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 1 hour.
				2. Protect elastomeric polyurea-polyurethane lining system from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.
				3. Cleaning: Remove temporary covering and clean elastomeric polyurea-polyurethane lining system just prior to final inspection. Use cleaning materials and procedures recommended by resinous lining manufacturer. General Contractor is responsible for cleaning prior to inspection.

END OF SECTION 098000