

# STONCHEM 441 GUIDE SPEC

SECTION 09800 - SPECIAL COATINGS

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This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

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**PART I GENERAL**

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Definitions: Elastomeric polyurea lining includes a penetrating, two-component, epoxy primer and a spray applied, high build, polyurea-polyurethane elastomeric coating.

1.03 SUBMITTALS

A. 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.

B. Samples: Submit, for verification purposes, 4-inch square samples of each type of elastomeric polyurea lining required, applied to a rigid backing, in color and finish indicated.

1.04 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain primary lining materials including primers, resins, hardening agents, finish or sealing coats from a single manufacturer with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Contractor shall have completed at least five projects of similar size and complexity; Stonhard or approved equal. Provide secondary materials only of type and from source recommended by manufacturer of primary materials.

B. Pre-Installation Conference

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

2. Attendance

a. General Contractor

b. Architect/Owner's Representative

c. Manufacturer/Installer's Representative

1.05 DELIVERY, STORAGE AND HANDLING

A. Material shall be delivered to job site and checked by lining manufacturer for completeness and shipping damage prior to job start.

B. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches.

C. Material shall be stored in a dry, enclosed area protected from exposure to moisture. Temperature of storage area shall be maintained between 50 to 90oF/10 to 32oC.

1.06 PROJECT CONDITIONS

A. 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 30 days minimum and conduct the following tests prior to application of overlayment:

1. 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.

2. 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.

3. 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.

4. 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.

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

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

B. Utilities, including electric, water, and finished lighting to be supplied by General Contractor.

C. Job area to be free of other trades during, and for a period of 8 hours, after lining installation.

D. Protection of finished lining from damage by subsequent trades shall be the responsibility of the General Contractor.

1.07 PROJECT CONTROL

A. Manufacturer shall be responsible for supervising and controlling the installation of the special coatings covered by this specification.

1.08 WARRANTY

A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of one (1) full year from date of installation.

**PART II PRODUCTS**

2.01 COLORS

A. Colors: Available in manufacturer's light gray.

2.02 ELASTOMERIC POLYUREA-POLYURETHANE LINING SYSTEM

A. The elastomeric polyurea-polyurethane lining system shall be Stonchem 441 as manufactured by Stonhard, Maple Shade, NJ, (800) 257-7953, [www.stonhard.com](http://www.stonhard.com), comprised of a penetrating two-component epoxy primer and a two-component, high build, polyurea-polyurethane elastomeric lining.

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.

a. Gel Time 1 hour

b. Cured for foot traffic 5 hours

2. Physical Properties: Provide lining system in which physical properties of topping, when tested in accordance with standards or procedures referenced below, are as follows:

# Tensile Strength 2,700 psi

**(ASTM D-638)**

**Hardness 50**

**(ASTM D-2240, Shore D)**

**Bond Strength >400 psi**

**(ASTM D-7234) (100% concrete failure)**

**Abrasion Resistance 0.035 gm max. weight loss**

**(ASTM D-4060, CS-17)**

**Elongation 125%**

**(ASTM D-638)**

**Tack Free Time 1 hour**

**(@ 70°F/21°C)**

**Low Temperature Flexibility Test -20°F/-29°C Pass**

**(ASTM D-522)**

**Coefficient of Friction 0.9 dry**

**(ASTM F-1679)**

**Cure Rate 1 hour tack free**

**(@ 70°F/21°C) 5 hours for foot traffic**

**24 hours for chemical service**

2.03 ENGINEERING DETAILS

A. POINTS OF TERMINATION

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

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

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

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

c. 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.

3. 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.

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

a. 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.

b. 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.

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

5. 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.

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

B. JOINTS AND CRACKS

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

2. 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.

3. 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.

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

C. CORNERS

1. Inside corners shall be treated with either an elastomeric or epoxy mortar radius (½” minimum) prior to application of the lining.
2. Outside corners shall be ground to remove sharp corners as part of surface preparation.

**PART III EXECUTION**

3.01 SPRAY EQUIPMENT

A. The type and condition of the spray equipment is critical to produce a high quality polyurea 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.

B. 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.

C. Spray gun shall be a WIWA 500F Airless as manufactured by WIWA Wilhelm Wagner LP.

D. 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.

3.02 ADDITIONAL REQUIREMENTS

A. Drum heaters are required to heat material if material temperature is below 65°F/18°C.

B. The following minimum services shall be provided to run the spray equipment and heaters:

1. Electric: Single phase, 110 or 220 volt

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

3.03 PREPARATION

A. 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.

B. Surrounding steel preparation shall be abrasive blasted to near white metal, according to SSPC-SP10.

3.04 APPLICATION

A. 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.

B. Primer: Mix and apply primer over properly prepared substrate with strict adherence to manufacturer's installation procedures and coverage rates.

C. Bug Hole Filler: Mix and apply bug hole filler as part of the priming in strict accordance with manufacturer’s installation procedure.

D. Inside Radius: Mix and apply radius filler material forming a minimum ½” radius in strict accordance with manufacturer’s installation procedures.

E. Cracks & Joints: Fill all cracks and joints with compatible elastomeric filler material in strict accordance with manufacturer’s instructions.

F. Lining: Spray apply elastomeric polyurea lining at a 2:1 ratio over properly cured primer with strict adherence to manufacturer’s installation procedures including but not limited to:

1. Primary Heat: 90 - 100°F/°C

2. Hose Heat: 125°F/°C

3. Spray Pressure: 2,000 – 2,300 psi with no greater than 300 psi pressure

differential between sides

3.05 FIELD QUALITY CONTROL

A. The right is reserved to invoke the following material testing procedure at any time, and any number of times during period of lining application.

B. 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.

C. 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.

D. 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.

E. 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.

F. 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.

3.06 CURING, PROTECTION AND CLEANING

A. 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.

B. 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.

C. 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.

END OF SECTION

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