Sto Textured Finish System for Concrete, Masonry and Stucco

Specification F300

Section 09540

This specification is intended for use by the design/construction professional and any user of Sto products to assist in developing project specifications and to provide guidance on the application of Sto Textured Wall Finishes to sound, vertical, above grade concrete, masonry or Portland cement plaster/stucco wall construction. Sto Textured Wall Finishes function as decorative and protective wall finishes. As with any wall finish the proper integration of other components of construction, in particular, the use of flashing to direct water to the exterior, is essential. Notes in italics, such as this one, are explanatory and intended to guide the design professional/specifier and user in the proper selection and use of materials. This specification should be modified where necessary to accommodate individual project conditions.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Materials and installation of textured wall finish system.

1.02 RELATED SECTIONS *(add/delete, depending on specific project requirements):*

A. Section 03300: Cast-In-Place Concrete

B. Section 03400: Precast Concrete

C. Section 04200: Unit Masonry
D. Section 06115: Sheathing
E. Section 07190: Vapor Barriers

F. Section 07500: Membrane Roofing

G. Section 07195: Air Barriers
H. Section 07620: Sheet Metal Flashing and Trim

I. Section 07920: Sealants and Caulking

J. Section 08400: Exterior Entrance Doors

K. Section 08500: Exterior Windows

L. Section 09220: Portland Cement Plaster
M. Section 09260: Gypsum Board Systems

1.03 REFERENCED DOCUMENTS *(add/delete depending on specific project requirements)*

A. ASTM Standards:

1. C 150 Specification for Portland Cement
2. C 926 Standard Specification for Application of Portland Cement-Based Plaster
3. C 1063 Standard Specification for Installation of Lathing and Furring for Portland Cement Plaster
4. D 4258 Standard Practice for Surface Cleaning Concrete for Coating
5. D 4259 Standard Practice for Abrading Concrete
6. D 4261 Standard Practice for Surface Cleaning Concrete Unit Masonry for Coating
7. E 283 Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences Across the Specimen.
8. E 330 Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
9. E 331 Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

1.04 DESIGN REQUIREMENTS

A. Structural (wind and axial loads)

1. Design for maximum allowable deflection, normal to the plane of the wall, of L/360.

2. Design for wind load in conformance with code requirements.

B. Moisture Control

1. Prevent the accumulation of water into or behind the finish, either by condensation or leakage into the wall construction, in the design and detailing of the wall assembly.

a. Provide corrosion resistant flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly, including, above window and door heads, beneath window and door sills, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, and at the base of the wall.

b. Air Leakage Prevention—see preface to Sto Specification A100G if an air barrier is desired or required in the wall construction.

c. Vapor Diffusion and Condensation-- perform a dew point analysis of the wall to determine the potential for accumulation of moisture in the wall assembly as a result of water vapor diffusion and condensation. Adjust insulation thickness and/or other wall assembly components accordingly to minimize the risk of condensation. Avoid the use of vapor retarders on the interior side of the wall in warm, humid climates.

d. On framed wall construction provide a code compliant moisture barrier over sheathing. Note: building codes vary with respect to the type moisture barrier required and the number of layers. For example, the Uniform Building Code

(UBC) requires two layers of Type 1 Grade D building paper over wood-based sheathings. Check the applicable code for the appropriate type. On masonry wall construction determine the need for dampproofing or waterproofing on the basis of the exposure conditions and the type wall assembly, whether cavity or single wythe, grouted or ungrouted masonry units.

e. Protect sills of rough openings with barrier membrane.

C. Grade Condition

1. Do not specify the finish for use below grade or on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure.

D. Sloped surfaces, including trim, projecting architectural features and reveals.

1. All trim and projecting architectural features must have a minimum 1:2 [27°] slope along their top surface. All horizontal reveals must have a minimum 1:2 [27°] slope along their bottom surface. Increase slope for northern climates to prevent accumulation of ice/snow and water on surface. Where trim/feature or bottom surface of reveal projects more than 2 inches (51 mm) from the face of the wall plane, protect the top surface with waterproofing. Periodic inspections and increased maintenance may be required to maintain surface integrity of finish on weather exposed sloped surfaces. Limit projecting features to easily accessible areas and limit total area to facilitate maintenance and minimize maintenance burden.

2. Do not use finish on horizontal or near horizontal weather exposed surfaces such as tops of parapets, projecting ledges, sills, or other projecting features. Protect such surfaces with metal coping or flashing with drip edge.

E. Joints

1. Indicate location of joints and joint type on architectural drawings.

2. Provide appropriate sealant at joints and terminations of finish with adjoining construction or dissimilar materials.

3. Prevent application of finish over isolation, expansion, cold or control joints in construction.

4. Prevent application of finish along inside edges of joint. Apply to outside face of wall only.

F. Substrates

1. Provide surface plane tolerance not to exceed ¼ inch in 10 feet (6 mm in 3m). Provide for repair of surface defects and leveling or resurfacing of surfaces that do not meet required tolerances.

2. *Concrete—prevent the use of form oil, curing compounds or other bond breakers that inhibit bond to the surface or provide for their removal.*

3. *Concrete Masonry—provide open texture concrete masonry units with flush joints.*

4. *Brick—provide absorbent brick with flush joints.*

5. *Portland Cement Plaster/Stucco—provide installation in conformance with ASTM C 926 (except omit finish installation and follow this specification).*

1.05 PERFORMANCE REQUIREMENTS

A. *(see appropriate Sto Product Bulletin for finish performance data)*

1.06 SUBMITTALS

A. Manufacturer's specifications, details, installation instructions and product data.

B. Manufacturer's standard warranty.

C. Samples for approval as directed by architect or owner.

D. Contractor’s list of project references.

E. Prepare and submit project-specific details (when required by contract documents).

1.07 QUALITY ASSURANCE

A. Manufacturer requirements

1. Textured wall finish system manufacturer for a minimum of twenty (20) years.
2. Manufacturing facilities ISO 9002 certified.
3. Single source manufacturer of surface repair/leveler materials, waterproofing and textured wall finish.

B. Contractor requirements

1. Licensed, insured and engaged in application of textured wall finishes for a minimum of three (3) years.
2. Knowledgeable in the proper use and handling of Sto materials.
3. Employ skilled mechanics who are experienced and knowledgeable in textured wall f Inuit application, and familiar with the requirements of the specified work.
4. Successful completion of minimum three (3) projects of similar size and complexity to the specified project.
5. Provide the proper equipment, manpower and supervision on the job site to install the finish system in compliance with Sto's published specifications and details and the project plans and specifications.

C. Provide field sample, minimum 8’x8’ (2.4 x 2.4 m) of textured wall finish system as reference standard.

D. Mock-up Testing *(for projects of sufficient size or complexity)*

1. Construct full-scale mock-up of typical stucco/window wall assembly with specified tools and materials and test air and water infiltration and structural performance in accordance with ASTM E 283, E 331 and E 330, respectively, through independent laboratory. Mock-up shall comply with requirements of project specifications. Where mock-up is tested at job site maintain approved mock-up at site as reference standard. If tested off-site accurately record construction detailing and sequencing of approved mock-up for replication during construction.

E. Inspections

1. Provide independent third party inspection where required by code or contract documents.
2. Conduct inspections in accordance with code requirements and contract documents.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.

B. Protect coatings (pail products) from freezing and temperatures in excess of 90°F (32° C). Store away from direct sunlight.

C. Protect Portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

1.09 PROJECT/SITE CONDITIONS

(Weather conditions affect application and drying time of materials. Hot or dry conditions limit working time and accelerate drying and may require adjustments in application and scheduling to achieve desired results; cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing.)

A. Maintain ambient and surface temperatures above 40°F (4°C) during application and drying period, minimum 24 hours after application of materials.

B. Provide supplementary heat for installation in temperatures less than 40°F (4°C) such that temperatures are maintained as in 1.09A. Prevent concentration of heat on uncured materials and vent fumes and other products of combustion to the outside to prevent contact with installed materials.

C. Provide protection of surrounding areas and adjacent surfaces from application of materials.

1.10 COORDINATION/SCHEDULING

(The work in this section requires close coordination with related sections and trades. Sequence work to provide protection of construction materials from weather deterioration.)

A. Provide minimum 28 day cure of concrete, concrete masonry units, brick and stucco before the installation of finish system.

B. For load bearing concrete masonry and stud wall assemblies, commence the finish system installation after completion of all floor, roof construction and other construction that imposes dead loads on the walls to prevent excessive deflection (and potential cracking) of the substrate.

C. Sequence interior work such as drywall installation prior to finish installation to prevent stud distortion (and potential cracking) of stucco substrates.

D. Provide site grading such that the finish terminates above grade or finished grade a minimum of 8 inches (203 mm) or as required by code.

E. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall and provide sill flashing. Coordinate installation of wall assembly moisture barrier with windows and doors to provide weather proofing of the structure and to prevent moisture infiltration and excess air infiltration.

F. Install window and door head flashing immediately after windows and doors are installed.

G. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior.

H. Install copings and sealant immediately after installation of the finish and when finish is dry.

I. Attach penetrations through finish to structural support and provide watertight seal at penetrations.

1.11 WARRANTY

A. Provide manufacturer's standard warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sto Corp.

B. Provide textured wall finish and leveling, resurfacing, and waterproofing materials from single source manufacturer.

2.02 SURFACE CONDITIONER *(optional component depending on substrate condition)*

A. Sto Plex W—water based acrylic surface conditioner for highly absorbent or chalking concrete or masonry surfaces.

2.03 FABRIC REINFORCEMENT

A. Sto Mesh—nominal 4.5 oz/yd^2 (153 g/m^2), symmetrical, interlaced open-weave glass fiber fabric made with minimum 20 percent by weight alkaline resistant coating for compatibility with Sto materials.

2.04 LEVELER *(select one, depending on substrate condition)*

A. Sto Leveler—fiber reinforced polymer modified cement based leveler for patching and resurfacing concrete and masonry surfaces (up to ½" [12 mm] in two coats).

B. Sto BTS-Plus—polymer modified cement based leveler for resurfacing concrete and masonry surfaces (up to 1/8" [3 mm] in two coats).

2.05 WATERPROOFING *(use to waterproof sloped sills, trim and other projecting features, and where necessary to waterproof the wall assembly, depending on wall assembly type and exposure conditions.)*

A. Sto Flexyl—acrylic based fiber reinforced waterproof membrane mixed with Portland Cement for concrete, masonry and stucco surfaces.

2.06 JOB MIXED INGREDIENTS

A. Water—clean and potable.
B. Portland cement—in compliance with ASTM C 150, Type I.

2.07 PRIMER

A. Sto Primer—acrylic based tinted primer.

(Note: priming is recommended to provide uniform substrate absorption and finish color, to improve adhesion and water resistance, and to retard efflorescence. Priming is required over waterproofing and forSto Granitex finish.)

2.08 FINISH *(select one from among the Sto textured wall finish products)*
A. Sto acrylic or silicone enhanced textured wall finish.

(Note: see appropriate Sto Product Bulletin for detailed information on finishes. Elastomeric textured wall finishes are recommended to provide best performance over cracks that may occur in stucco.)

2.09 MIXING

A. Sto Leveler--mix ratio with water: 6-7 quarts (5.7-6.6 L) of clean water per 60 pound (27 kg) bag of Sto Leveler. Pour water into a clean mixing pail. Add Sto Leveler, mix to a uniform consistency, using a low speed electric drill mixer, and allow to set for

approximately 5 minutes. Adjust mix if necessary with additional Sto Leveler or water and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent and mix each batch separately. Do not exceed maximum amount of water in mix ratio.

(Note: Sto Leveler may also be mixed with a mortar mixer by adding clean water to the mixer, then Sto Leveler. Mix three to six bags per batch.)

B. Sto BTS Plus--mix ratio with water: 7-9 quarts (6.6-8.5 L) of water per 60 pound (27 kg) bag of Sto BTS Plus. Pour water into a clean mixing pail. Add Sto BTS Plus, mix to a uniform consistency and allow to set for approximately 5 minutes. Adjust mix if necessary with additional Sto BTS Plus or water and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent. Do not exceed maximum amount of water in mix ratio.

C. Sto Flexyl--mix ratio with Portland cement: 1:1 ratio by weight. Pour Sto Flexyl into a clean mixing pail. Add Portland cement, mix to a uniform consistency and allow to set for approximately five minutes. Adjust mix if necessary with additional Sto Flexyl and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent.

D. Primer--mix with a clean, rust-free high speed mixer to a uniform consistency.

E. Finish--mix with a clean, rust-free high speed mixer to a uniform consistency. A small amount of water may be added to adjust workability. Limit addition of water to amount needed to achieve the finish texture.

F. Mix only as much material as can readily be used.

G. Do not use anti-freeze compounds or other additives.

PART 3 EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. Pre-qualify under Quality Assurance requirements of this specification (section 1.07.B).

3.02 EXAMINATION

A. Inspect surfaces for:

1. Contamination—algae, curing compounds, dirt, dust, efflorescence, form oil, fungus, grease, laitance, mildew or other foreign substances.
2. Surface absorption, chalkiness or weak surface condition.
3. Cracks—measure crack width and record location of cracks.
4. Damage, deterioration and surface defects—spalls, scaling, honeycombs, bugholes, pitted surfaces and other voids.
4. Moisture content and moisture damage--use a moisture meter to determine if the surface is dry enough to receive the textured finish system and record any areas of moisture damage.

5. Plumbness/trueness/squareness—record areas that are not plumb, true and square or not in compliance with specified tolerances.

B. Report deviations from the requirements of project specifications or other conditions that might adversely affect the finish system installation to the General Contractor and provide for their correction.

3.03 SURFACE PREPARATION

A. Concrete (Cast-in-Place and Precast)

1. Provide a surface that is water absorbent, free of surface contamination such as algae, curing compounds, dirt, dust, efflorescence, form oil, fungus, grease, laitance, mildew or other foreign substances, straight and true to line and plane. Remove form ties and trim projecting concrete so it is even with the plane of the wall. Remove form release agents by washing with a trisodium phosphate detergent and thoroughly rinsing with clean water. Remove efflorescence by mechanically scraping or abrading the surface with a wire brush. Refer to ASTM D 4258 for cleaning practice and other cleaning methods that may apply.

B. Concrete Masonry Units and Brick

1. Provide a surface that is free of surface contamination such as algae, dirt, dust, efflorescence, oil, fungus, grease, mildew or other foreign substances, straight and true to line and plane. Remove projecting joint mortar so it is even with the plane of the wall. Remove grease, oil and dirt by washing with a trisodium phosphate detergent and thoroughly rinsing with clean water. Remove efflorescence by mechanically scraping or abrading the surface with a wire brush. Refer to ASTM D 4261 for cleaning practice and other cleaning methods that may apply.

C. Portland Cement Plaster/Stucco

1. Provide a surface that is free of surface contamination such as algae, dirt, dust, efflorescence, oil, fungus, grease, mildew or other foreign substances, straight and true to line and plane. Remove grease, oil and dirt by washing with a trisodium phosphate detergent and thoroughly rinsing with clean water. Remove efflorescence by mechanically scraping or abrading the surface with a wire brush.

D. Painted, Non-absorbent or Weak Concrete or Brick Surface, Painted Concrete Masonry, Brick and Stucco

1. Where the surface is painted or non-absorbent, where a weak surface condition exists, or where bond-inhibiting material cannot be removed following the surface cleaning methods described in 3.03 A, B or C above, prepare the surface by mechanical abrasion. Use sandblasting, waterblasting, wire brushing, chipping or other appropriate means to remove the weakened surface condition, paint, surface contamination or any other bond-inhibiting material and to provide a roughened surface profile. Refer to ASTM D4259 for mechanical abrasion practice.

(Note: when the surface is prepared by mechanical abrasion as in section 3.03 D, resurfacing is generally required [section 3.05]. For 3.03 A, B, C and D above, where

bond inhibiting material cannot be removed, where concrete or masonry surface irregularities are such that more than 1/2 inch [12 mm] of leveler must be applied, or where the surface is too dense or non-absorbent to receive the finish system by any of the surface preparation methods described above, install furred or self-furred lath in accordance with ASTM C 1063 as a base for Portland cement plaster/stucco and the finish.

3.04 SURFACE CONDITIONING *(optional component, depending on surface condition, for use over chalking or excessively absorbent concrete, concrete masonry, brick or stucco)*

A. Apply surface conditioner uniformly by roller or spray application to the prepared surface.

3.05 REPAIR OF SURFACE DEFECTS *(as required by surface conditions)*

A. Patching

1. Repair surface defects such as spalls, honeycombs, bugholes, pitting or other voids in the surface by preparing the areas as described under surface preparation (Section 3.03). Pre-moisten (no standing or glistening water) the prepared area and apply appropriate leveler in one or multiple applications to fill the void until it is flush with the surface. Moist cure the patch when hot or dry weather conditions exist.

B. Crack Repair

1. Repair static surface cracks up to 1/16 inch wide (1.6 mm) by centering a 4-6 inch (100-150 mm) wide strip of reinforcing fabric over the length of the crack and fully embedding the fabric in the leveling material. Feather the edges so the build-up in material will not be noticeable.

3.06 RESURFACING

(Note: new concrete, concrete masonry, brick, and stucco require minimum 28 day cure before the installation of leveler or finish. Resurfacing is required over concrete masonry, brick and where surfaces have been prepared by mechanical abrasion as in section 3.04 D to provide a surface that is sufficiently smooth, uniform and plumb to receive the finish for an aesthetically acceptable appearance. Cast-in-place concrete may also require resurfacing depending on the degree to which it is out of plane or the number of surface irregularities. Pre-cast concrete and stucco generally do not require resurfacing, except in cases where smooth or fine aggregate finishes [<1.0 mm] are used. Depending upon the trueness of the wall surface, the frequency of architectural breaks in the wall such as pilasters, changes in plane or other aesthetic features, and the area of wall to be finished, the leveler used to resurface the wall may need to be thick [generally up to ½" (12 mm) for large unbroken wall surfaces], or thin [generally up to 1/8" (3 mm) for wall surfaces of limited dimension or walls with many architectural breaks]. The reinforcing fabric may be embedded in the leveling coat as a gage for controlling thickness and to improve crack resistance and aesthetics. The reinforcing fabric must be completely embedded such that the fabric color does not show through the leveling coat. For best results always prepare a field mock-up panel for approval as a reference standard.)

A. Installation over prepared concrete, concrete masonry, brick and stucco:

1. Pre-moisten concrete masonry units and absorbent concrete or brick prior to the placement of leveler.

2. Apply the leveler with a stainless steel trowel and with sufficient pressure to ensure intimate contact with the prepared substrate and complete coverage to an approximate thicknes of 1/8--1/4 inch (3-6 mm). Where reinforcing mesh is used embed the reinforcing mesh in the wet leveler and trowel from the center to the edges of the fabric. Trowel the leveling coat smooth such that the fabric is fully embedded and no fabric color shows through. Overlap fabric seams minimum 2-1/2 inches (64 mm). Reskim areas where fabric color shows through, or, apply a second coat of leveler if necessary to completely hide the fabric color or to completely level the surface.

3. When applying a second coat of leveler apply it as soon as the first coat is firm enough to receive the second coat without damage. Apply the second coat with sufficient pressure to ensure intimate contact with the first coat to an approximate thickness of 1/8 to 1/4 inch (3--6 mm) as needed to bring the surface to the desired thickness. Use a rod or straight edge to bring the surface to a true, even plane. Fill depressions in plane with additional leveler.

4. The finished surface must be true, square and level to within ¼ inch in 10 feet (6 mm in 3 m).

5. Moist cure after the leveler has set by lightly fogging the surface for at least 48 hours. Fog as frequently as required during the 48 hour period to prevent loss of moisture from the leveler. Avoid eroding the surface with excess moisture. If relative humidity exceeds 75% the frequency of moist-curing can be diminished.

3.07 WATERPROOFING

A. Apply waterproofing to prepared surfaces by trowel to an approximate thickness of 1/16 inch (1.6 mm). When applying to sloped sills, trim or other projecting features embed reinforcing fabric in the waterproofing material and extend fabric minimum 4 inches (100 mm) above and below the projecting feature and feather the edges. Completely embed the fabric so no fabric color shows through. Overlap fabric seams a minimum of 2-1/2 inches (64 mm).

(Note: waterproofing is required for sloped sills, trim and other features that project more than 2 inches (51 mm) from the plane of the wall surface and for the bottom surface of horizontal reveals with more than 2 inches (51 mm) recess. Minimum required slope of the surface is 1:2 [27°]. In certain cases where waterproofing of the entire surface is desired or required by exposure conditions or the type wall assembly [for example, single wythe open cell concrete masonry], the waterproofing application may take the place of resurfacing [section 3.05.)

3.08 PRIMING.

A. Apply primer evenly with brush, roller or proper spray equipment over the clean, dry surface and allow to dry thoroughly before applying finish.

(Note: priming is recommended to provide uniform substrate absorption and finish color, to improve adhesion and water resistance, and to retard efflorescence. Priming is required over waterproofing and forSto Granitex finishes.)

3.09 FINISHING

A. Apply finish directly over the primed wall surface. Apply finish by spraying or troweling with a stainless steel trowel, depending on the finish specified. Follow these general rules for application of finish:

1. Allow the substrate to dry minimum 28 days.
2. Avoid application in direct sunlight.
3. Apply finish in a continuous application, and work to an architectural break in the wall.
4. Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying. Adjustments in the scheduling of work may be required to achieve desired results; cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing. Adjust work schedule and provide protection.
5. Float "R" (rilled texture) finishes with a plastic trowel to achieve their rilled texture.
6. Do not install separate batches of finish side-by-side.
7. Do not apply finish into or over joints or accessories. Apply finish to outside face of wall only.
8. Do not apply finish over irregular or unprepared surfaces, or surfaces not in compliance with the requirements of the project specifications.

3.10 PROTECTION

A. Provide protection of installed materials from water infiltration into or behind them.

B. Provide protection of installed leveler from dust, dirt, precipitation, and freezing.

C. Provide protection of installed primer and finish from dust, dirt, precipitation, freezing and continuous high humidity until fully dry.