



Building with conscience.

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## **Sto Guide Specification 5600 StoTherm® ci Mineral**

### **Section 07 24 00**

*This guide 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 StoTherm ci Mineral to vertical above grade exterior wall construction. The StoTherm ci Mineral System is a water-drainage system that incorporates a continuous air and water-resistive barrier, adhesive, continuous mineral wool insulation, thermal dowel and fasteners, fiberglass mesh reinforced base coat, and a decorative and protective finish coat. For further design guidance refer to the StoTherm ci Mineral Design Guide and StoTherm ci Mineral Guide Details at <http://www.stocorp.com>*

## PART 1 GENERAL

### 1.1 SUMMARY

- A. Provide air and water-resistive barrier with continuous mineral wool insulation and finish system for vertical above grade exterior walls
- B. Related Sections *(add/delete, depending on specific project requirements)*
  - 1. Section 06 16 00: Sheathing
  - 2. Section 07 26 00: Vapor Retarders
  - 3. Section 07 27 00: Air Barriers
  - 4. Section 07 50 00: Membrane Roofing
  - 5. Section 07 62 00: Sheet Metal Flashing and Trim
  - 6. Section 07 90 00: Joint Protection
  - 7. Section 08 10 00: Doors and Frames
  - 8. Section 08 40 00: Entrances, Storefronts, and Curtain Walls
  - 9. Section 08 50 00: Windows

### 1.2 SUBMITTALS

- A. Manufacturer's specifications, details, installation instructions and product data
- B. Manufacturer's standard warranty
- C. Applicator's industry training credentials
- D. Samples for approval as directed by architect or owner
- E. Sealant manufacturer's certificate of compliance with ASTM C1382
- F. Prepare and submit project-specific details (when required by contract documents)

### 1.3 REFERENCES

- A. ASTM Standards:
  - C612 Standard Specification for Mineral Fiber Block and Board Thermal insulation
  - C920 Standard Specification for Elastomeric Joint Sealants
  - C1177 Specification for Glass Mat Gypsum for Use as Sheathing
  - C1382 Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish Systems (EIFS) Joints
  - E84 Test Method for Surface Burning Characteristics of Building Materials
  - E119 Method for Fire Tests of Building Construction and Materials
  - E283 Standard Test Method of Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences across the Specimen

- E330 Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
- E2178 Standard Test Method for Air Permeance of Building Materials
- E2273 Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad wall Assemblies
- E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
- E2568 Standard Specification for PB Exterior Insulation and Finish Systems
- E2570 Standard Test Method for Evaluating Water-Resistive Barrier (WRB) Coatings Used Under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage

- B. ICC Evaluation Reports
  - ICC-ESR 5027 StoTherm ci Mineral
- C. Sto Corp Publications
  - Design Guide: *StoTherm ci Mineral*
  - Detail Booklet: *StoTherm ci Mineral over Steel Frame*

## 1.4 DESIGN REQUIREMENTS

*Consult StoTherm ci Mineral Design Guide and StoTherm ci Mineral Detail Booklet for guidance on design and design details. Coordinate this section with other material specification sections and detail drawings as applicable.*

## 1.5 PERFORMANCE REQUIREMENTS

*Choose A or B below for vapor permeable or vapor impermeable air and water-resistive barrier*

- A. Air and Water-Resistive Barrier: vapor permeable air and water-resistive barrier with air leakage of less than 0.004 cfm/ft<sup>2</sup> (0.02 L/s/m<sup>2</sup>) when tested in accordance with ASTM E2178 and 0.04 cfm/ft<sup>2</sup> (0.2 L/s/m<sup>2</sup>) when tested in accordance with ASTM E2357
- B. Air and Water-Resistive Barrier: vapor impermeable air and water-resistive barrier with allowable air leakage of less than 0.004 cfm/ft<sup>2</sup> (0.02 L/s/m<sup>2</sup>) when tested in accordance with ASTM E2178
- C. Non-combustible Insulation: comply with ASTM C612 Type IV requirements
- D. Exterior Insulation and Finish System: comply with ASTM E2568 (except tensile bond strength)
- E. Meet requirements for use on combustible (Type V) and noncombustible (Types I, II, III, and IV) construction as stated in ICC ESR (see ICC-ESR 5027)
- F. Retain or add to hourly rating of existing hourly rated base wall assembly as demonstrated by testing in accordance with ASTM E119.

## 1.6 QUALITY ASSURANCE

- A. Manufacturer Requirements
  - 1. Air and Water-resistive Barrier and insulated wall cladding manufacturer for a minimum of thirty-five (35) years

2. Manufacturing facilities: ISO 9001 Certified Quality System and ISO 14001 certified Environmental Management System
  3. Member in good standing with EIMA (EIFS Industry Members Association)
  4. Maintain current ICC Evaluation Report (see ICC-ESR 5027)
- B. Contractor Requirements
1. Engaged in application of similar systems 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 air and water-resistive barrier and plaster application, and familiar with the requirements of the specified work
  4. Successful completion of minimum of 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 system in compliance with Sto's published specifications and details and the project plans and specifications
- C. Insulation Board Manufacturer Requirements
1. Mineral wool board manufacturer for a minimum of 30 years
  2. Recognized by Sto as being capable of producing mineral wool insulation board to meet Sto Specification requirements
- D. Mock-up Testing
1. Construct full-scale mock-up of typical air and water-resistive barrier and exterior cladding /window wall assembly with specified tools and materials and test air and water infiltration and structural performance in accordance with ASTM E 283, ASTM E 331 and ASTM 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

## 1.7 COMPLIANCE

- A. Air and Water-resistive Barrier
1. Meets or exceeds maximum allowable material air leakage requirements of the 2021 IECC based on independent laboratory testing in accordance with ASTM E2178
  2. Meets or exceeds maximum allowable assembly air leakage requirements of the 2021 IECC based on independent laboratory testing in accordance with ASTM E2357
  3. Meets requirements of ICC AC 212 for coatings used as WRBs over sheathing
  4. Listed as compliant with 2021 IBC, IRC, and IECC in a current ICC-ES Evaluation Report ([consult ICC ESR-1233](#))
  5. Meets VOC emission standard of South Coast AQMD Rule 1113 for Building Envelope Coatings
- B. EIFS Cladding

1. Complies with requirements of 2021 IBC Section 1407.4.1 as EIFS with drainage
  2. Complies with requirements of 2021 IRC Section R703.9 as EIFS with drainage
  3. Listed as compliant with 2021 IBC and IRC in a current ICC-ES Evaluation Report for use on buildings of any construction type (*consult ICC ESR-5027*)
  4. Textured finishes comply with emission standard of South Coast AQMD Rule 1113 for Architectural Coatings
- C. Joint Sealant for Use with EIFS
1. Conforms with ASTM D920: Type S, Grade NS, Use NT, A, M, Class 100/50
  2. Meets Federal Specification TT-S-00230C Type II
  3. Conforms with AAMA 808.3 (Type1) Exterior Perimeter Sealant

## 1.8 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.
- D. Store mineral wool in a dry location off the ground out of direct sunlight.

## 1.9 PROJECT/SITE CONDITIONS

*(Weather conditions affect application and drying time of most products. Hot or dry conditions limit working time and accelerate drying and may require adjustments in the scheduling of work 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 air and water-resistive barrier and insulation finish system products
- B. Provide supplementary heat for installation in temperatures less than 40°F (4°C)
- C. Provide protection of surrounding areas and adjacent surfaces from application of products

## 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 site grading such that the wall cladding assembly terminates above grade a minimum of 6 inches (150 mm)
- B. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors and other wall penetrations to provide a continuously connected air and water-resistive barrier
- C. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall

- D. Install window and door head flashing immediately after windows and doors are installed
- E. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior
- F. Install splices or tie-ins from air and water-resistive barrier over back leg of flashings, starter tracks, and similar details to form a shingle lap that directs incidental water to the exterior
- G. Install copings and sealant immediately after installation of the wall cladding finish coatings when they are dry, and such that, where sealant is applied against the wall cladding surface, it is applied against the base coat or primed base coat surface
- H. Schedule work such that the air and water-resistive barrier is exposed to weather no longer than 180 days
- I. Attach penetrations through the wall cladding to structural support and provide watertight seal at penetrations

### 1.11 WARRANTY

- A. Provide manufacturer's standard warranty

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Provide air and water-resistive barrier, insulation, coatings and accessories from single source manufacturer or approved supplier
- B. The following are acceptable manufacturers:
  - 1. Sto Corp. – air and water-resistive barrier, adhesive, reinforced base coat, finish coat, plaster accessories, joint sealant
  - 2. Rockwool® – specially designed rock wool insulation board for compatibility with Sto materials

### 2.2 AIR AND WATER-RESISTIVE BARRIER

*Refer to Sto Guide Details, Sto RapidGuard Installation Guide, and StoGuard Conformable Membrane Installation Guide to assist in selecting the proper detail components*

- A. StoGuard Detail Components
  - 1. Sheathing Joint Treatment, Rough Opening (RO) Protection, Counterflashing, and Penetrations:
    - a. Sto Gold Coat, Sto AirSeal, or StoGuard VaporSeal: brush, spray or roller applied air and water-resistive barrier coating used with StoGuard Fabric reinforcement
    - b. Sto RapidGuard: single component rapid drying gun-applied STPE detail component
    - c. Sto Gold Fill: trowel applied detail component used with StoGuard Mesh, glass fiber self-stick reinforcing mesh
    - d. StoGuard Conformable Membrane – self-adhered membrane flashing for use over prepared vertical above-grade concrete, concrete masonry, brick masonry, wood sheathing, glass mat gypsum sheathing, and cementitious sheathing
  - 2. Static Joints and Seams

- a. Sto RapidGuard: single component rapid drying gun-applied treatment for static joint transitions to dissimilar construction (i.e., masonry to frame wall), balcony floor slab-to-ceiling, and wall sheathing to foundation
3. Static and Dynamic Joints
  - a. StoGuard Conformable Membrane: self-adhered membrane flashing for use over prepared vertical above-grade concrete, concrete masonry, brick masonry, wood sheathing, glass mat gypsum sheathing, and cementitious sheathing used to:
    - Seal joints and seams in wall sheathing
    - Seal static joints between dissimilar materials
    - Flash exterior wall openings and protect rough openings
    - Seal between window flange and wall sheathing
    - Connect to above grade foundation waterproofing
    - Connect to roof membrane
    - Seal around wall penetrations such as pipes, scuppers, vents
    - Back masonry wall ties
    - Seal dynamic joints in wall construction

*Choose one coating and select application by Substrate (B1a, B2a, or B3), Medium Build (B1b, B2b, or B3), or High Build (B1c, B2c, or B3) as indicated*

B. Air and Water-resistive Barrier Coating

1. Sto Gold Coat: ready mixed vapor permeable air and water-resistive barrier coating applied
  - a. By substrate as follows:
    - Glass Mat Gypsum: apply one coat at minimum 10 mils WFT
    - Plywood: apply one coat at minimum 10 mils WFT
    - Cement Board: apply one coat at minimum 10 mils WFT
    - OSB: apply one or two coats at minimum 20 mils WFT. If applied by roller, apply two coats. Touch up any bare spots and raised OSB strands.
    - CMU: apply two or three coats at minimum 20-60 mils WFT.
    - Concrete: apply one coat at minimum 10 mils WFT
  - b. To a Medium-Build in one or two coats to achieve minimum 20 mils WFT (if applied by roller apply two coats to achieve minimum 20 mils WFT. For CMU substrates apply two or three coats to achieve 20-60 mils WFT).
  - c. To a High-Build in two or three coats to achieve 40 mils WFT (if applied by roller apply three or more coats as needed. For CMU substrates apply multiple coats to achieve 40-60 mils WFT).
2. Sto AirSeal: ready mixed vapor permeable air and water-resistive barrier coating applied
  - a. By substrate as follows:
    - Glass Mat Gypsum: apply one coat at minimum 20 mils WFT
    - Plywood: apply one coat at minimum 20 mils WFT
    - Cement Board: apply one coat at minimum 20 mils WFT
    - OSB: apply one or two coats at minimum 20 mils WFT. If applied by roller, apply two coats. Touch up any bare spots and raised OSB strands.
    - CMU: apply two or three coats at minimum 20-65 mils WFT.
    - Concrete: apply one coat at minimum 20 mils WFT

- b. To a Medium-Build in one or two coats to achieve minimum 40 mils WFT (if applied by roller apply two coats to achieve minimum 40 mils WFT. For CMU substrates apply two or three coats to achieve 40-65 mils WFT).
  - c. To a High-Build in one, two or three coats to achieve minimum 65 mils WFT (if applied by roller apply minimum three coats to achieve minimum 65 mils WFT).
3. StoGuard VaporSeal: Class 1 vapor retarder coating for use over prepared vertical above-grade concrete, concrete masonry, brick masonry, wood sheathing, cementitious sheathing, and glass mat gypsum sheathing, applied by airless spray in one or two coats to achieve minimum 80 mils total WFT

## 2.3 ADHESIVE

- A. Sto BTS Plus – factory blended one-component polymer-modified portland cement based high build adhesive

## 2.4 INSULATION BOARD

- A. Rockwool Frontrock® MD (Mono Density) stone wool insulation board in conformance with ASTM C612, Type IV requirements, nominal 8.5 lb/ft<sup>3</sup> density (136 kg/m<sup>3</sup>), 2ft x 4ft width x length (0.6 x 1.2 m), 2 inches (51 mm), 2.5 inches (64mm), 3 inches (76 mm) or 4 inches (102 mm) thick, and R-4.0 hr-ft<sup>2</sup>-F/Btu per inch (RSI - 0.70 m<sup>2</sup>-K/W)

## 2.5 THERMAL DOWEL AND FASTENERS

- A. Sto Thermo Dowel: 2-3/8 inch diameter (60 mm) Thermal Dowel with ¼ inch (6 mm) corrosion resistant star head type screw fastener for wood frame, steel frame, or masonry wall construction.

## 2.6 BASE COAT

- A. Sto BTS Plus – factory blended one component polymer modified portland cement based high build base coat. Also used as a leveler for concrete and masonry surfaces.
- B. Waterproof Base Coat (*choose one*)
1. Sto Flexyl – fiber reinforced acrylic based waterproof base coat mixed with portland cement (for use as a waterproof base coat over Sto BTS Plus for foundations, parapets, splash areas, trim and other projecting architectural features)
  2. Sto Watertight Coat – pre-packaged two component fiber reinforced acrylic based waterproof base coat (for use as a waterproof base coat over Sto BTS Plus for foundations, parapets, splash areas, trim and other projecting architectural features)

## 2.7 REINFORCING MESHES

- A. Medium Impact Resistance (impact resistance requirement: 25-49 in-lb [2.83-5.54J])
1. Sto Mesh – nominal 4.5 oz/yd<sup>2</sup> (153 g/m<sup>2</sup>), symmetrical, interlaced open-weave glass fiber fabric made with alkaline resistant coating for compatibility with Sto materials
- B. High Impact Resistance (impact resistance requirement: 90-150 in-lbs [(10.2-17J)])
1. Sto Mesh 6 oz – nominal 6.0 oz/yd<sup>2</sup> (203 g/m<sup>2</sup>), symmetrical, interlaced open-weave glass fiber fabric made with alkaline resistant coating for compatibility with Sto materials
- C. Ultra-High Impact Resistance (impact resistance requirement: greater than 150 in-lbs [17 J])



1. Sto Intermediate Mesh – nominal 11.0oz./yd<sup>2</sup> (373 g/m<sup>2</sup>), ultra-high impact, interwoven, open weave glass fiber fabric with alkaline resistant coating for compatibility with Sto materials *(recommended to a minimum height of 6'-0" [1.8m] above finished grade at all areas accessible to pedestrian traffic and other areas exposed to abnormal stress or impact).*
- D. Specialty Meshes
  1. Sto Detail Mesh – nominal 4.2 oz/yd<sup>2</sup> (143 g/m<sup>2</sup>), flexible, symmetrical, interlaced glass fiber fabric, with alkaline resistant coating for compatibility with Sto materials *(used for standard back wrapping, pre-wrapping, and aesthetic detailing such as reveals, chamfers, and trim)*

## 2.8 PRIMER *(optional component-choose one)*

- A. StoPrime Sand – acrylic based tintable primer with sand for roller application
- B. StoPrime Smooth – acrylic based tintable smooth primer

## 2.9 FINISH COAT

*(select one)*

- A. Stolit Lotusan Finish – integrally colored, factory blended textured Lotus-Effect Technology wall finish with graded marble aggregate
- B. Stolit HDP™ Finish – integrally colored, factory blended textured hydrophobic wall finish with graded marble aggregate
- C. Stolit Finish – integrally colored, factory blended, acrylic textured wall finish with graded marble aggregate
- D. Stolit X Finish – integrally colored, factory blended, acrylic based textured wall finish with graded marble aggregate and enhanced polymer technology for easy spread and float application
- E. Sto Essence DPR Finish – integrally colored, factory blended, acrylic textured wall finish with graded marble aggregate
- F. StoSignature Finishes – Stolit acrylic based textured wall finish applied with specialized techniques to achieve unique textures, impressions or effects. Refer to [www.stocorp.com](http://www.stocorp.com) for StoSignature Finishes Brochure and Installation Guides.
- G. Sto Specialty Finishes – acrylic based textured wall finishes with colored aggregates that create unique aesthetic effects.
- H. StoCast Finishes – Sto custom cast pre-formed decorative and protective finish and adhesive
  1. StoCast Wood
  2. StoCast Brick

## 2.10 JOB MIXED INGREDIENTS

- A. Water – clean and potable

## 2.11 ACCESSORIES

- A. Sto-Mesh Corner Bead Standard – one component PVC (polyvinyl chloride) accessory with integral reinforcing mesh for outside corner reinforcement.
- B. Sto Drip Edge Profile - one component PVC (polyvinyl chloride) accessory with integral reinforcing mesh that creates a drip edge and plaster return.
- C. StoSeal® STPE Sealant - high-movement, low modulus, non-sag one-component silyl-terminated polyether joint sealant in compliance with ASTM C920 and tested in accordance with ASTM C1382

## 2.12 MIXING

- A. Mix all products in conformance with manufacturer's written instructions.

# PART 3 EXECUTION

## 3.1 ACCEPTABLE INSTALLERS

- A. Prequalify under Quality Assurance requirements of this specification (section 1.6 B)

## 3.2 EXAMINATION

- A. Inspect all surfaces to receive the wall system. Surfaces must be fully cured, structurally sound, clean, dry and free of frost, damage, and all bond inhibiting materials, including dirt, dust, efflorescence, form oil and other foreign matter.
- B. Inspect sheathing surfaces for compliance with this specification, the applicable building code, and manufacturer requirements.
- C. Inspect surface plane for compliance with tolerance of not greater than ¼ inch in 8 feet [6mm in 2438 mm] deviation in plane.
- D. Report deviations from the requirements of project specifications or other conditions that might adversely affect the air and water-resistive barrier, insulation board, or insulation finish system installation to the General Contractor. Do not start work until deviations are corrected.

## 3.3 SURFACE PREPARATION

- A. Remove surface contaminants, repair cracks, spalls or damage in concrete and concrete masonry surfaces and level concrete and masonry surfaces to comply with required tolerances. Repair holes, gaps, over-driven fasteners in sheathing surfaces, and replace damaged sheathing

## 3.4 INSTALLATION

- A. Install air and water-resistive barrier, continuous insulation, and insulation finish system in conformance with manufacturer's written instructions. Refer to StoTherm ci Mineral Installation Guide and applicable product bulletins.

## 3.5 PROTECTION

- A. Provide protection of installed materials from water infiltration during and after construction

- B. Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry

### 3.6 CLEANING, REPAIR AND MAINTENANCE

- A. Clean and maintain the finished wall surface for a fresh appearance and to prevent water entry into and behind the system. Repair cracks, impact damage, spalls or delamination promptly
- B. Maintain adjacent components of construction such as sealants, windows, doors, and flashing, to prevent water entry into or behind the wall cladding assembly
- C. Refer to Sto reStore Repair and Maintenance Guide ([reStore Program](#)) for detailed information on restoration – cleaning, recoating, resurfacing and refinishing, or re-cladding

#### ATTENTION

Sto products are intended for use by qualified professional contractors, not consumers, as a component of a larger construction assembly as specified by a qualified design professional, general contractor or builder. They should be installed in accordance with those specifications and Sto's instructions. Sto Corp. disclaims all, and assumes no, liability for on-site inspections, for its products applied improperly, or by unqualified persons or entities, or as part of an improperly designed or constructed building, for the nonperformance of adjacent building components or assemblies, or for other construction activities beyond Sto's control. Improper use of Sto products or use as part of an improperly designed or constructed larger assembly or building may result in serious damage to Sto products, and to the structure of the building or its components. **STO CORP. DISCLAIMS ALL WARRANTIES EXPRESS OR IMPLIED EXCEPT FOR EXPLICIT LIMITED WRITTEN WARRANTIES ISSUED TO AND ACCEPTED BY BUILDING OWNERS IN ACCORDANCE WITH STO'S WARRANTY PROGRAMS WHICH ARE SUBJECT TO CHANGE FROM TIME TO TIME.** For the fullest, most current information on proper application, clean-up, mixing and other specifications and warranties, cautions and disclaimers, please refer to the Sto Corp. website, [www.stocorp.com](http://www.stocorp.com).