



Building with conscience.

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Sto Guide Specification 9000M
StoVentec® for Masonry Veneer Facades

Section 07 44 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 StoVentec for Masonry Veneer Facades to vertical above grade exterior wall construction. StoVentec for Masonry Veneer Facades is a drained, back-ventilated rainscreen wall system that incorporates a continuous air and moisture barrier, continuous noncombustible mineral wool insulation, sub-construction, reinforcing mesh, base coat, and adhesive for the masonry veneer applied to a carrier board that is manufactured from recycled glass.

Notes in italics, such as this one, are explanatory and intended to guide the design/construction professional 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

1.1 SUMMARY

- A. Provide air and moisture barrier, continuous noncombustible mineral wool insulation, sub-construction, recycled glass carrier board, primer, base coat, reinforcing mesh, and masonry veneer adhesive for vertical above grade exterior walls.
- B. Related Sections *(add/delete, depending on specific project requirements)*
 - 1. Section 03 30 00: Cast-in-Place Concrete
 - 2. Section 04 22 00: Concrete Unit Masonry
 - 3. Section 04 71 00: Manufactured Brick Masonry
 - 4. Section 05 40 00: Cold-Formed Metal Framing
 - 5. Section 06 16 00: Sheathing
 - 6. Section 07 21 00: Thermal Insulation
 - 7. Section 07 26 00: Vapor Retarders
 - 8. Section 07 27 00: Air Barriers
 - 9. Section 07 50 00: Membrane Roofing
 - 10. Section 07 62 00: Sheet Metal Flashing and Trim
 - 11. Section 07 80 00: Fire and Smoke Protection
 - 12. Section 07 90 00: Joint Protection
 - 13. Section 08 10 00: Doors and Frames
 - 14. Section 08 40 00: Entrances, Storefronts, and Curtain Walls
 - 15. Section 08 50 00: Windows

1.2 SUBMITTALS

- A. Manufacturer's specifications, details, installation instructions and product data
- B. Manufacturer's code compliance certification
- C. Manufacturer's standard warranty
- D. Applicator's industry training credentials
- E. Samples for approval as directed by architect or owner
- F. Prepare and submit project-specific engineering calculations
- G. Prepare and submit project-specific shop drawings

1.3 REFERENCES

- A. AAMA Standards
 - AAMA 509 Voluntary Test and Classification Method for Drained and Back-Ventilated Rainscreen Wall Cladding Systems

- B. ANSI Standards
 - A118.4 Specifications for Modified Dry-Set Cement Mortars
 - A118.7 Specifications for High Performance Cement Grouts for Tile Installation
- C. ASHRAE Standards
 - ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings
- D. ASTM Standards
 - A370-19 Standard Test Methods and Definitions for Mechanical Testing of Steel Products
 - C150 Standard Specification for Portland Cement
 - C482 Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste
 - C612 Standard Specification for Mineral Fiber Block and Board Thermal insulation
 - C1088 Standard Specification for Thin Veneer Brick Units Made from Clay or Shale
 - C1177 Specification for Glass Mat Gypsum for Use as Sheathing
 - 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
 - E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
 - E2178 Standard Test Method for Air Permeance of Building Materials
 - E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
 - E2570 Standard Test Methods for Evaluating Water-Resistive Barrier (WRB) Coatings Used under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage
- E. International Building Codes
 - IECC International Energy Conservation Code
- F. ICC Evaluation Service (ICC-ES), Acceptance Criteria (AC)
 - AC491 Self-drilling Tapping Screws Used with Aluminum
 - AC118 Tapping Screw Fasteners Used in Steel-to-steel Connections
- G. NFPA Standards
 - NFPA 220 Standard on Types of Building Construction
 - NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components
- H. European Standards (EN)
 - EN 10088-2 Standard for chemical composition Stainless Steel

- EN AW-6063 Standard for extrusion alloy
- EN 755-2 Standard specifies the mechanical property limits resulting from tensile testing applicable to aluminium and aluminium alloy extruded rod/bar, tube and profile
- EN 755-9 Standard for tolerances on dimensions and form for aluminium and aluminium alloy extruded profile
- I. Sto Corp.
 - Sto 90.M.xx StoVentec for Masonry Veneer Facades Design Guide and Detail Booklet

1.4 DESIGN REQUIREMENTS

NOTE: Coordinate this section with other material specification sections and detail drawings as applicable. Refer to Sto Design Guide and Detail Booklet for additional information

- A. Allowable deflection normal to the plane of the wall for back-up wall construction: L/400
- B. Comply with allowable whole building air leakage requirement of {insert air leakage resistance}
- C. Conform with applicable design wind pressure requirements of {insert design wind pressure}
- D. Conform with fire-resistive design requirements of {insert hourly fire-resistance rating}
- E. Comply with applicable U-value requirements of {insert U-value}
- F. Wind load and building height
 1. Design for maximum allowable deflection of L/400, or stiffer when required by veneer manufacturer, local building code, or design professional. Maximum allowable stud spacing: 16 inches (406mm) on center. System can achieve ultimate wind load capacity of: +120 / -90 lb/ft² (+5.75 / -4.31 kPa).
 2. Design for wind load in conformance with code requirements.
 3. The system is intended for use on vertical above grade walls up to 6-stories or 72ft (22m) in height, whichever is less.
- G. Joints
 1. Provide joints where they exist in the supporting wall construction - at expansion, control, and cold joints, at changes in support construction (e.g., masonry to frame wall), at junctures with dissimilar construction, at different substrates, at floor lines in multi-story wall construction, at changes in building height and other areas of stress concentration, and within areas of not greater than 144 ft² (13.4m²) with length or height not exceeding 18 ft (5.5m) for thin brick and with length/height or height/length ratio not greater than 2-1/2 to 1. Dark colored veneer units may require closer spacing due to increased thermal movement. Consult with design professional. Do not bridge expansion joints, control joints, or cold joints in wall construction with adhered masonry veneer. Size joints to correspond with anticipated movement. Align terminating edges of masonry veneer/carrier board with joint edges of through wall expansion joints and similar joints in construction. Refer to StoVentec for Masonry Veneer Façades Design Guide and Detail Booklet.
 2. Provide grout or pointing mortar for all masonry veneer joints (open joints are not permitted).
 3. Provide minimum 1/2 inch (13 mm) wide perimeter sealant joints at all penetrations through the rainscreen system (windows, doors, mechanical, electrical, and plumbing penetrations, etc.).
 4. Specify compatible backer rod and sealant or bond breaker and sealant to ensure two-sided adhesion.

5. Maintain air barrier continuity across the joints to prevent excess air leakage and water infiltration at joints.
 6. Size joints in accordance with anticipated movement
 7. Indicate location of joints, accessories, and accessory type on architectural drawings
- H. Grade Condition
1. Do not specify the StoVentec system below grade or for use on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure. Provide minimum 6-inch (152mm) clearance above grade or as required by code.
- I. Insulation Thickness
1. Standard mineral wool thickness up to 7 inches (178mm).
 2. Custom mineral wool thickness available where required by code or design documents.
- J. Sub-Construction
1. StoVentec brackets available in Aluminum (ALUM) and Stainless Steel (SS) brackets
 2. Bracket sizes, heights, spacing, and layout determined by design pressures on the project. See StoVentec Load Tables or contact Sto Corp.
- K. Masonry Veneer Size Limits Based on IBC and IRC
1. Maximum thickness: 5/8 inch (16mm); thicker units permitted if dimensioned for application by the thin set method (consult with veneer unit manufacturer)
 2. Maximum allowable weight: 15 lb/ft² (70 kg/m²)
 3. Maximum size: not to exceed 36 inches (914mm) in any face dimension and not more than 5 ft² (0.46m²)

1.5 PERFORMANCE REQUIREMENTS

NOTE: For detailed performance, test results and criteria, refer to StoVentec for Masonry Veneer Facades Testing Summary

- A. Air and Moisture Barrier
1. Vapor permeable air and moisture barrier: material air leakage less than 0.004 cfm/ft² (0.02 L/s/m²) when tested in accordance with ASTM E2178.
 2. Vapor permeable air and moisture barrier: assembly air leakage less than 0.00 cfm/ft² (0.2 L/s/m²) when tested in accordance with ASTM E2357.
 3. Water-resistive barrier in conformance with physical requirements of ASTM E2570
- B. Insulation
1. Non-combustible mineral wool insulation as defined by NFPA 220 in compliance with ASTM C612 Type IVA requirements with 0 flame spread and 0 smoke development when measured in accordance with ASTM E84
- C. Intumescent Tape
1. Nominal 75 lb/ft³ (1200 kg/m³) flexible intumescent material of exfoliated graphite that foams up under influence of pressure and temperature

NOTE: select one fire break method. Refer to applicable code for metal fire breaks and Sto guide details for others

- D. Fire Break

1. Metal Fire Break - Minimum 0.38mm corrosion resistant metal of sufficient dimension to overlap inner face of carrier board by minimum 10mm (~3/8in)
2. Composite Fire Break - Mineral Wool – Nominal 6 lb/ft³ (96kg/m³) density, minimum 4 in (~100mm) tall non-combustible mineral wool insulation lamella strip (fibers oriented perpendicular to wall), faced with intumescent tape, nominal 75 lb/ft³ (1200 kg/m³) flexible intumescent material of exfoliated graphite that foams up under influence of pressure and temperature
3. Dual Barrier Fire Break - Nominal 6 lb/ft³ (96kg/m³) density, minimum 4 in (~100mm) tall non-combustible mineral wool insulation lamella strip (fibers oriented perpendicular to wall), cut for compression fit between vertical T-Profiles, and combined with metal fire break, minimum 0.38mm corrosion resistant metal of sufficient dimension to overlap inner face of carrier board by minimum 10mm (~3/8in), faced with minimum 50mm (2in) tall intumescent tape

E. Sub-Construction

1. 2.5mm (~1/8in) Large - Fixed Point (FP) and 2.0mm (~1/16in) Small - Gliding Point (GP), Type 304 stainless steel wall brackets conforming to strength class S230 per EN 10088-2
2. 4.2mm (~3/16in) Large – Fixed Point (FP) and 3.2mm (~1/8in) Small – Gliding Point (GP) wall brackets, quality EN AW-6063 T66 aluminum, tolerance in accordance with EN 755-9 and 6005A-T5 aluminum, tolerance in accordance with ASTM A370-19
3. Minimum 2.0mm (~1/8in) Type 6063 T-66 or 6005A-T5 aluminium alloy T-Profiles and L-Profiles. EN AW-6063 T66 per EN 755-2, or 6005A-T6 with minimum tensile strength of 35534 psi (245 N/mm²) and 6005A-T5 aluminum, tolerance in accordance with ASTM A370-19

F. Carrier Board

1. Nominal ½ inch (12mm) carrier board made of expanded glass granulate with nominal density of 31.2 lb/ft³ (500 kg/m³) and thermal conductivity of 0.052 BTU/h-ft·°F (0.09 W/m·K) consisting of 90%+ recycled glass content

1.6 QUALITY ASSURANCE

A. Manufacturer Requirements

1. Air and moisture barrier, insulated wall cladding, and architectural finish system manufacturer for a minimum of thirty-five (35) years
2. Manufacturing facilities: ISO 9001 Certified Quality System and certified Environmental Management System

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 moisture barrier, curtain wall and rainscreen wall application, thin brick masonry veneer 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
6. Provide engineering calculations to verify conformance with project wind load resistance requirements and adequacy of attachment to back-up wall construction

7. Provide shop drawings with details at joints, seams, penetrations, and connections at foundation and roofing for air barrier continuity; spacing, layout and connections of sub-construction components; location and type of fire breaks; layout, connections, and joint spacing between wall sections; sill flashing, copings, jamb closures, and joint sealant type(s), size and locations
- C. Insulation Board Manufacturer Requirements
 1. Mineral wool board manufacturer for a minimum of 30 years
 - D. Masonry Veneer Manufacturer Requirements
 1. Provide masonry veneer units in conformance with the IBC and IRC size, weight, and durability requirements.
 2. Provide masonry veneer units in conformance with ASTM C1088 of type and quality suitable for environmental exposure conditions of project and certify suitability in writing.
 3. Provide masonry veneer units that comply with minimum 50 lb/in² (0.345 N/mm²) shear bond strength when tested in accordance with ASTM C482.
 - E. Mock-up Testing
 1. Construct full-scale mock-up of typical air/moisture 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 E283, ASTM E331 and ASTM E330, 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.
 - F. 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 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product. Store cartons and bundles of material inside in a dry area until ready for use on pallets. Store off the ground on pallets in a dry location out of direct sunlight during installation.
- B. Store portland cement-based products in a dry area off the ground out of direct sunlight
- C. Store wet products (pail products) in a dry area and protect from extreme heat, 90 degrees F (32 degrees C), freezing, and direct sunlight
- D. Store sealant (cartridge and sausage products) in a cool (less than 80 degrees F [26.7 degrees C]) dry area. Protect from heat, freezing, moisture, and direct sunlight. Store away from sources of ignition.
- E. Store accessories (mesh, tapes, fabrics, and pvc components in cartons) flat, off the ground in a dry location. Protect from direct sunlight. Store mesh roll cartons flat (not upright).

1.8 PROJECT/SITE CONDITIONS

- A. Provide a secure staging area for storage of sub-structure components, carrier board, and accessories, to protect from damage

- B. Provide supplementary heat for installation of portland cement based (bagged products) and coating (pail products) and sealant (cartridge and sausage products) in temperatures less than 40°F (4°C)
- C. Provide supplementary heat for installation of sub-construction in temperatures less than 25°F (-3.8°C)
- D. Maintain ambient and surface temperatures between 45 and 85°F (7 and 29°C) during application and drying period of masonry veneer adhesive – not less than 24 hours.
- E. Provide protection of surrounding areas and adjacent surfaces from application of products

1.9 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 (152 mm)
- B. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors, and other wall penetrations to provide a continuously connected air and moisture barrier
- C. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall
- D. Schedule work such that the air and moisture barrier is exposed to weather no longer than 180 days
- E. Install window and door head flashing immediately after windows and doors are installed
- F. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior
- G. Install sheet metal flashing and trim closures at terminations with windows, doors, and similar through wall penetrations
- H. Install sub-construction after air and moisture barrier is completely dry
- I. Install fire breaks at floor lines, openings, and other required locations
- J. Install continuous insulation between or over sub-construction
- K. Install sill flashings, copings, jamb closures, and sealant immediately after installation of the finished wall assembly
- L. Attach penetrations at locations identified on architectural drawings and attach to structural support
- M. Provide airtight and watertight seals to the air and moisture barrier at the plane of the air/moisture barrier and at penetrations through the wall to the cladding assembly

1.10 WARRANTY

- A. Provide manufacturer's standard warranty

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide air and moisture barrier, sub-construction, carrier board, primer, base coat, reinforcing mesh, masonry veneer adhesive, and accessories from single source manufacturer or approved supplier
- B. The following are acceptable manufacturers:
 - 1. Sto Corp. – air and moisture barrier, sub-construction, carrier board, primer, base coat, reinforcing mesh, masonry veneer adhesive, and accessories
 - 2. Owens-Corning – mineral wool insulation, mineral wool floor line fire barrier
 - 3. Rolf Kuhn – flexible intumescent tape

2.2 AIR AND MOISTURE BARRIER

Note: Select any of the listed joint treatment/rough opening protection/detail component options and top coat with the listed air and moisture barrier coating

- A. StoGuard®
 - 1. Joint Treatment, Rough Opening Protection, and Static Transition Detail Components:
 - a. Sto Gold Fill® – ready mixed coating applied by trowel or knife for rough opening protection of frame walls and joint treatment of sheathing when used with StoGuard Mesh. Also used as a detail component with StoGuard Mesh to splice over back flange of starter track, flashing, and similar ship lap details
 - b. Sto AirSeal™ with StoGuard Fabric and RediCorners - ready mixed coating applied by brush, roller, or spray for joint treatment of sheathing when used with StoGuard Fabric, and rough opening protection of frame walls when used with StoGuard Fabric and RediCorners. Also used as a detail component with StoGuard Fabric to splice over back flange of starter track, flashing, and similar ship lap details
 - c. Sto RapidGuard® - one component STPE rapid drying gun-applied treatment for sheathing joints, rough openings, seams, cracks, penetrations, and other static transitions in above grade wall construction
 - 2. Air and Moisture Barrier Coating
 - a. Sto AirSeal® – ready mixed vapor permeable air and moisture barrier coating for concrete, concrete masonry, wood-based sheathing, and glass mat gypsum sheathing
 - 3. Static or Dynamic Transition Detail Component
 - a. StoGuard Transition Membrane – flexible air barrier material for continuity at static transitions such as sheathing to foundation, dissimilar materials (CMU to frame wall), wall to balcony floor slab or ceiling, and shingle lap transitions to flashing. Also used for dynamic joints: floor line deflection joints, masonry control joints, and through wall joints in masonry or frame construction

2.3 INSULATION BOARD

- A. Owens Corning Thermafiber® RainBarrier 45 mineral wool insulation board in conformance with ASTM C612, Type IVA requirements, nominal 4.5 lb/ft³ density (0.28 kg/m³), and R-4.3 per inch (RSI - 0.74 per 25mm)

2.4 FLOOR LINE FIRE STOP

Note: A, B, and C are acceptable alternatives.

- A. Metal fire break
 - 1. Minimum 0.38mm corrosion resistant metal of sufficient dimension to overlap inner face of carrier board by minimum 10mm (~3/8in)
- B. Composite Fire Break - mineral wool insulation with surface mount intumescent tape:
 - 1. Owens Corning Thermafiber® RainBarrier HD mineral wool insulation board in conformance with ASTM C612, Type IVA requirements, nominal 6.0 lb/ft³ density (96.1 kg/m³), and R-4.3 per inch (RSI - 0.74 per 25mm) with glass fibers oriented perpendicular to the plane of the wall.
 - 2. Rolf Kuhn 2mm (~1/16in) ROKU® intumescent strip with adhesive backing (field applied over insulation – refer to Sto Details)
- C. Dual Barrier Fire Break – mineral wool insulation with metal fire break and intumescent tape
 - 1. Owens Corning Thermafiber® RainBarrier HD mineral wool insulation board in conformance with ASTM C612, Type IVA requirements, nominal 6.0 lb/ft³ density (96.1 kg/m³), and R-4.3 per inch (RSI - 0.74) with glass fibers oriented perpendicular to the plane of the wall.
 - 2. Minimum 0.38mm corrosion resistant metal of sufficient dimension to overlap inner face of carrier board by minimum 10mm (~3/8in) (field applied over insulation – refer to Sto Details)
 - 3. Rolf Kuhn 2mm (~1/16in) ROKU® intumescent strip with adhesive backing (field applied over metal fire break – refer to Sto Details)

2.5 SUB-CONSTRUCTION

- A. StoVentro stainless-steel (SS) or aluminum (ALUM) wall brackets, aluminum T-profiles, and aluminum L-profiles capable of complying with ANSI/ASHRAE 90.1-2016 and IECC-2018.
- B. Steel Classification: Structural Steel (SS)
 - 1. StoVentro Bracket – SS, material properties grade 304 or 316TI steel
- C. Aluminum Classification: Aluminum (ALUM)
 - 1. StoVentro Bracket – ALUM, material properties are 6063-T66 aluminum
 - 2. StoVentro T-Profile, material properties are 6063-T66 or 6005A-T5 aluminum
 - 3. StoVentro L-Profile, material properties are 6063-T66 or 6005A-T5 aluminum
- D. Spacing: Comply with Professional Engineer's project specific calculations for wall brackets and profiles
- E. Wall Brackets
 - 1. StoVentro Bracket – SS is a stainless-steel wall bracket. All brackets have a spring finger for insertion of StoVentro T or L Profiles, except the 40mm (~1-9/16") and 60mm (~2-3/8") depth brackets. Brackets range in depth from 40mm to 360mm, in 20mm increments (~1-9/16" - ~14 3/16") in (~13/16") increments. Brackets provide 30mm (~1-3/16") adjustability. Large Brackets (FP) transfer dead loads and wind loads to primary structure. Small Brackets (GP) transfer only wind loads to the primary structure.

2. StoVentro Bracket – ALUM is an aluminum wall bracket. A thermal break accessory is available with the brackets to minimize thermal bridging effects. Brackets range in depth from 40mm to 320mm, in 20mm increments (~1 9/16" - ~12 5/8") in (~13/16") increments. Brackets provide 30mm (~1 3/16") adjustability. Large Brackets (FP) transfer dead loads and wind loads to the primary structure. Small Brackets (GP) transfer only wind loads to the primary structure.
3. StoVentro Bracket – PHSS is specially designed bracket for Passive House wall construction that is free from thermal bridges and maximizes thickness of insulation that can be used in the wall assembly. Brackets range in depth from 200mm to 360mm, in 10mm increments (~7-7/8" – ~14-3/16") in (~3/8") increments. Brackets provide 30mm (~1 3/16") adjustability. Large Brackets (FP) transfer dead loads and wind loads to the primary structure. Small Brackets (GP) transfer only wind loads to the primary structure.

Note: StoVentro brackets of stainless-steel material were included in NFPA 285 Fire Test and corresponding proprietary Sto Corp design listings. StoVentro ALUM brackets and PHSS brackets were not included in NFPA 285 Fire Test. Contact Sto Corp. for status of design listings for each of these bracket materials and verify conformance of final wall assembly with NFPA 285 acceptance criteria.

- F. Support Profiles are aluminum rails/profiles. The profiles are the supporting sub-construction of the specified wall cladding. StoVentro L-Profiles are acceptable for use where the cladding panel fastener to edge distance design allows and used to stiffen outside corners at cantilevered sections.
 1. StoVentro T-Profiles come in lengths of 3m and 6m (~9'-10" and ~19'-7") and have a bearing surface of 90mm (~3 9/16") or 120mm (~4 3/4")
 2. StoVentro L-Profiles come in lengths of 3m and 6m (~9'-10" and ~19'-7") and have a bearing leg surface of 40mm (~1-9/16") and 50mm (2")

G. Thermal isolation

1. The optional components may be used with the use of StoVentro Bracket – ALUM, SS & PHSS
 - a. Thermal Blocking Element for SS and ALUM StoVentro brackets– 6mm (~1/4") thick thermal break accessory that isolates the wall bracket from thermal bridging effects of the primary structure, in two sizes to match the footprint of the large or small bracket.
 - b. Thermal Blocking Element for PHSS StoVentro brackets– 10 mm (~3/8") thick thermal break accessory that isolates the wall bracket from thermal bridging effects of the primary structure, in two sizes to match the footprint of the large or small bracket.
 - c. Thermal Sliding Element – 1mm (1/32") thick thermal break accessory that isolates the StoVentro 'T', 'L'-Profiles, or other StoVentro profiles from thermal bridging effects of the wall bracket.

Note: Thermal isolation elements were not included in NFPA 285 Fire Test. Contact Sto Corp. for status of design listing for each of these components.

H. Fasteners

1. StoVentro Sub-construction screw is a self-drilling, hexagonal head stainless steel screw with a hardened drill point and overtightening protection for attachment of StoVentro T-Profiles and StoVentro L-Profiles to StoVentro Brackets.
 - a. Size: 5.5mm x 22mm (~3/16" x 7/8"), 500 per box

- I. Sub-construction attachment to exterior building wall
 1. Attachment to steel studs
 - a. StoVentro bracket to steel stud attachment screw is a 1/4in-14 (6.35mm-14), high drilling capacity, self-drilling, hexagonal head, bi-metal (stainless steel + carbon steel) screw. For attachment of StoVentro Brackets to (18g-12ga) steel studs. Lengths of 1", 1-1/2", and 2" (25mm, 38mm, and 51mm), are available. The StoVentro bracket to steel stud attachment screw includes an integral stainless steel + EPDM bonded washer of 19/32" diameter. Performance data shall meet AC491 and AC118.
 2. Attachment to concrete, grout-filled CMU, and wood exterior building walls
 - a. Contact Sto Corp.

2.6 CARRIER BOARD

- A. StoVentec Carrier Board A+ (12mm [~1/2in]) is a lightweight composite board made of recycled glass granulate for use in the StoVentec for masonry veneer facades.

2.7 ACCESSORIES

- A. Sto Starter Profile PH-K for support of insulation board at base of wall
- B. Sto Edge Protection Profiles (G, GT) and Sto Roof Vent Profiles with integral glass fiber reinforcing mesh for protecting exposed ends and edges of 12mm (~1/2 in) carrier board
- C. Aluminum L-Rail Profile for protecting exposed ends and edges of 12mm (~1/2 in) carrier board
- D. Sto-Mesh Corner Bead Standard with integral glass fiber reinforcing mesh for outside corner reinforcement
- E. StoVentro Render Façade Screw - 5.5x24mm (~3/16 x 1in) flat head fasteners for carrier board to T-profile connection, 6.0x28mm (~1/4 x 1-1/8in) flat head fasteners for carrier board to steel stud connection
- F. Sto Ventilation Profile (ALU 30/40, ALU 40/100) for ventilation at base of wall
- G. Stainless steel flashing, trim, and corners (by others)
- H. Aluminum Trims and accessories (by others)
- I. Stainless steel fasteners for mounting brackets to steel stud, wood stud, concrete, or concrete masonry back-up wall construction (by others)
- J. Fasteners, impaling pins, or other attachment devices for mounting insulation, floor line fire break materials (by others)

2.8 PRIMER

Note: primer component is required over StoVentec Carrier Board A+ prior to the installation of base coat and mesh.

- A. Primer – StoPrime acrylic-based primer

2.9 BASE COAT

- A. Base Coat - Sto Primer/Adhesive is an acrylic-based material. It is a two-component product to be combined with Type 1 Portland cement.

2.10 REINFORCING MESHES

- A. Sto Mesh 6oz – nominal 6 oz/yd² (203 g/m²) glass fiber reinforcing mesh treated for compatibility with Sto materials

2.11 MASONRY VENEER ADHESIVE

- A. StoColl – polymer modified Portland cement adhesive mortar for masonry veneer in conformance with ANSI 118.4

2.12 MASONRY VENEER GROUT / POINTING MORTAR

- A. Polymer modified portland cement grout in conformance with ANSI 118.7

2.13 JOB MIXED INGREDIENTS (BY OTHERS)

- A. Water – clean and potable
- B. Portland cement – Type I in conformance with ASTM C150

2.14 MIXING

- A. Sto AirSeal – mix with a clean, rust-free high speed mixer to a uniform consistency
- B. StoColl - mix ratio with water: 8.5 quarts (8.1L) potable water to one 55 lb. (25kg) bag of adhesive. Mix with a slow speed electric drill and paddle. Pour water into a clean mixing container. Mix while slowly adding the product to the water. Mix for approximately 2 minutes, allow to set for approximately 5 minutes, then re-mix for approximately 30 seconds to achieve a uniform, lump-free consistency. Avoid retempering. Do not overmix. Keep mix ratio consistent
- C. Grout / Pointing Mortar – mix in conformance with manufacturer’s written instructions
- D. Mix only as much material as can readily be used
- E. Do not use anti-freeze compounds or other additives

PART 3 EXECUTION

3.1 ENGINEERING AND SHOP DRAWINGS

- A. Cladding sub-contractor shall provide shop drawings with details at joints, seams, penetrations, and connections at foundation and roofing for air barrier continuity; spacing, layout and connections of sub-construction components (including fixed or sliding point brackets) and connections (fixed or sliding point); location and type of fire breaks; layout, connections, and joint spacing between wall sections; sill flashing, copings, jamb closures, and joint sealant type(s)

3.2 ACCEPTABLE INSTALLERS

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

3.3 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 10 feet [6mm in 3.0m] deviation in plane.
- D. Report deviations from the requirements of project specifications or other conditions that might adversely affect the air and moisture barrier, sub-construction, insulation board, carrier board, or masonry veneer installation to the General Contractor. Do not start work until deviations are corrected.

3.4 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
- B. Repair cracks, spalls or damage in concrete and concrete masonry surfaces and level concrete and masonry surfaces to comply with required tolerances
- C. Apply conditioner (consult Sto) by spray or roller to chalking or excessively absorptive surfaces or pressure wash to remove surface chalkiness
- D. Remove fasteners that are not anchored into supporting construction and seal holes with air barrier material
- E. Seal over-driven fasteners with air barrier material and install additional fasteners as needed to comply with fastener spacing requirement
- F. Fill large gaps between sheathing or voids around pipe, conduit, scupper, and similar penetrations with spray foam and shave flush with surface (refer to Sto Details)
- G. Replace weather-damaged sheathing and repair or replace damaged or cracked sheathing

3.5 INSTALLATION

NOTE: The air/moisture barrier described below is one set of materials in the air barrier system and the moisture protection for the structure. Installation of the air/moisture barrier must be integrated with flashing and other air and moisture barrier materials to ensure that where water is likely to penetrate the wall assembly, it will be drained to the exterior at the source of the leak. Proper air barrier connections and integration of the air/moisture barrier through proper sequencing of work and coordination of trades is necessary for a complete air barrier system and complete moisture protection.

- A. Air/Moisture Barrier Installation over Exterior or Exposure I Wood-Based Sheathing (Plywood and OSB), Glass Mat Faced Gypsum Sheathing in Compliance with ASTM C 1177, and Concrete, or Concrete Masonry (CMU) Wall Construction
1. Transition Detailing
 - a. Detail transition areas with Sto RapidGuard or StoGuard Transition Membrane to achieve air barrier continuity. For illustrations of installation, refer to Sto Guide Details and [Sto RapidGuard Installation Guide](#) or [StoGuard Transition Membrane Installation Guide](#) (www.stocorp.com).
 2. Rough Opening Protection (select 1, 2 or 3 for frame construction; for concrete or concrete masonry rough openings with wood bucks and similar openings with complex 3-dimensional geometry, select no. 3, Sto RapidGuard):
 - a. Sto Gold Fill with StoGuard Mesh: apply 9 inch (229 mm) wide StoGuard Mesh at rough openings. Immediately apply Sto Gold Fill by spray or trowel over the mesh and spread with a trowel to create a smooth surface that completely covers the mesh (refer to Sto Detail 22s.20M).
 - b. Sto AirSeal with StoGuard Fabric: apply coating liberally by spray or roller to corners of openings, immediately place StoGuard RediCorners in the wet coating, and apply additional coating over the RediCorners to completely embed them. After all corners have been completed apply coating liberally to the entire rough opening, immediately place StoGuard Fabric in the wet coating, smooth any wrinkles with a brush or roller, and apply additional coating over the fabric to completely embed it. Overlap all seams minimum 2 inches (51 mm). Once completed top coat with additional coating as needed to completely seal the surface. Allow to dry and inspect for pinholes or voids. If pinholes or voids are present, seal with additional coating or Sto RapidGuard (refer to Sto Detail 22s.20F).
 - c. Sto RapidGuard: apply a fillet bead of material with a caulking gun at interior corners inside the opening to seal jamb/sill and jamb/head seams. Apply material in a zig-zag pattern along sill, jambs, and head to form a generous bead of material along the surface to be covered. Use a 6 inch (152 mm) wide plastic drywall knife to spread the material to a uniform thickness of 12-20 mils (0.3-0.5 mm) before the material skins. Treat the entire rough opening surface in this manner and overlap onto the face of the sheathing 2 inches (51 mm) minimum all the way around (refer to Sto Detail 22s.20RG)
 3. Sheathing Joint Treatment (select one)
 - a. Sto Gold Fill with StoGuard Mesh: place 4 inch (102 mm) wide mesh centered along sheathing joints and minimum 9 inch (229 mm) wide mesh centered and folded at inside and outside corners. Immediately apply Sto Gold Fill by spray or trowel and spread with a trowel to create a smooth surface that completely covers the mesh.
 - b. Sto AirSeal with StoGuard Fabric: apply coating liberally by spray or roller along sheathing joints and immediately place 4 inch (102 mm) wide fabric centered over the joints into the wet coating, and 6 inch (152 mm) wide fabric centered and folded at inside and outside corners into the wet coating. Smooth any wrinkles with a brush or roller and apply additional coating to completely embed the fabric. Overlap seams minimum 2 inches (51 mm).
 - c. Sto RapidGuard: apply to properly installed sheathing - joints butted for gypsum sheathing, and joints gapped for plywood and OSB sheathings (wood-based sheathing typically requires 1/8 inch [3 mm] spacing at edge and end joints). Apply a thick bead of Sto RapidGuard with a caulking gun along sheathing joints or apply in

a zig-zag pattern across and down the joints. Spread to a uniform thickness of 20-30 mils (0.5-0.6 mm) before the material skins. Spread 1 inch (25 mm) beyond the sheathing joint on each side. Follow the same procedure for inside and outside corners.

4. Air/Moisture Barrier Coating Installation

- a. Apply coating to the prepared substrate using airless spray equipment that pumps a minimum 1 gallon (3.8 L) per minute. Suggested tip size is .029. Pressure and tip size may vary depending on equipment used. Spray uniformly at thickness of approximately:
 - 50 wet mils to achieve minimum 30 mil DFT
 - 66 wet mils where 40 mil DFT is specified

If necessary, allow material to set slightly (up to 1 hour depending on weather and substrate conditions), and double back with a second pass to achieve total thickness. Alternatively, apply in two coats, allowing the first coat to fully dry.

CMU surfaces may require back rolling of the first pass with a 3/4 or 1 inch (19 or 25 mm) synthetic nap roller depending on porosity, joint profile, trueness of the wall surface, and other variables that may exist. Avoid excess build-up of wet material to prevent sag, especially on non-porous surfaces and during cold or damp weather. A VOID AND PINHOLE SURFACE must be achieved for the coating to properly function as an air and moisture barrier on CMU (and other wall surfaces).

5. Air /Moisture Barrier Connections and Shingle Laps

- a. Coordinate installation of connecting air barrier components with other trades to provide a continuous airtight membrane.
- b. Coordinate installation of flashing and other moisture protection components with other trades to achieve complete moisture protection such that water is directed to the exterior, not into the wall assembly, and drained to the exterior at sources of leaks (windows, doors and similar penetrations through the wall assembly).
- c. Splice-in head flashings above windows, doors, floor lines, roof/sidewall step flashing, and similar locations with StoGuard detail component to achieve shingle lap of the air/moisture barrier such that water is directed to the exterior.

NOTE: Windows and doors are typically installed following installation of the air/moisture barrier and work should be sequenced accordingly. Consult with window manufacturer for installation requirements to maintain air barrier continuity and for head, jamb, sill flashing and perimeter sealant requirements needed to prevent leaks into the wall assembly.

B. Sub-construction installation

1. Install Sub-construction in strict accordance with manufacturer's installation instructions and engineering shop drawings.
2. Install Sub-construction to be level, plumb, and in alignment with building features including corners, off-sets, and penetrations.
3. StoVentro Wall Brackets, StoVentro T-Profile, L-Profiles, or other StoVentro profiles
 - a. Mount wall brackets at maximum 16 inches (406) mm on center horizontally to supporting wall construction as indicated by engineering shop drawings.
 - i. Brackets must be laid out at 1/2-inch (12mm) increments vertically.

- ii. Tighten screws to structural wall to a snug tight condition and not stripped. Do not over-torque beyond manufacturer's recommendation. If installed using hand tools, verify for each installer at beginning of project using snug-tight criteria. Do not use stripped holes.
 - b. Attach StoVentro profile to wall brackets in accordance with engineering shop drawings, align plumb and level, and account for irregularities in supporting wall construction.
 - c. Establish and re-establish and restart bracket locations using laser or chalk-line at penetrations and other obstructions to establish alignment.
 4. Thermally isolate aluminum wall brackets by inserting thermal isolation materials between wall brackets and substrate.
 5. Attach T-Profiles and L-Profiles, or other StoVentro profiles, by use of StoVentro Sub-construction screw through pre-punched holes in the brackets
 6. To cut the aluminum profiles, use a miter saw, electric shears or Dremel rotary tool.
 7. The systems components should not be cut while installed on the building, unless using a shearing instrument.
 8. Provide a 10mm gap between profiles/rails for expansion when multiple lengths of profiles are installed.
- C. Carrier Board Installation
1. Determine the size and layout of carrier boards from project specific shop drawings. All carrier boards must end and begin at StoVentro T-Profile centerlines.
 2. Fasten carrier boards with StoVentro Render Façade Screws. Level carrier board, then fasten in each corner of the board to hold in place. Mark a reference point on the carrier board of the centerline of the T-Profile. Fasten the carrier board on the edges and in the field per project specification drawings or to meet project ultimate design pressure. Do not overdrive screws, ensure fasteners are flush with the carrier board.
 3. All carrier boards should be installed in a staggered/running-bond layout. At openings, cut the carrier board to an L-Shape.
 4. To cut carrier boards, score and cut board with knife, then flip and cut the back side of the carrier board. Boards can also be cut with a circular saw. Always observe proper PPE procedures when cutting carrier boards.
 5. Sto Edge Protection profiles must be used on exposed edges of carrier board (grade, sills, heads, jambs, top-of system, vertical edge transitions to other façade, and inside corners). Install Sto edge protection profiles after primer installation.
 6. At outside corners or jamb returns, a StoVentro L-Profile should be used to stiffen the corner. See StoVentec for Masonry Veneer Facade details and installation videos for proper installation. Sto Mesh Corner Beads must be used at outside corners and jamb returns.
 7. At cantilever, install a StoVentro L-Profile for cantilever lengths over 6" (152mm) and not more than 16" (406mm) in length. Review project specific drawings or StoVentec for Masonry Veneer Facade details to confirm maximum allowed ultimate design pressures.
- D. Primer Installation
1. Apply with brush, roller, or proper spray equipment to the carrier board surface to prepare the surface for Sto base coat and reinforcing mesh application.
- E. Base Coat and Reinforcing Mesh Installation

1. Apply minimum Sto Mesh Corner Beads or 9x12 inch (225x300 mm) diagonal strips of detail mesh at corners of windows, doors, and all penetrations through the system. Embed the strips in wet base coat and trowel from the center to the edges of the mesh to avoid wrinkles.
2. Embed Sto Edge Protection profiles in wet base coat and trowel from the inside to the edges of the mesh to avoid wrinkles.
3. 6 oz mesh application: Apply base coat over the carrier board with a stainless steel trowel to a uniform thickness of approximately $\frac{1}{8}$ inch (3 mm). Work horizontally or vertically in strips of 40 inches (1016mm), and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Overlap mesh not less than 2- $\frac{1}{2}$ inches (64mm) at mesh seams and at overlaps of detail mesh. Feather seams and edges. Double wrap all inside and outside corners with minimum 6 inch (152mm) overlap in each direction. Avoid wrinkles in the mesh. The mesh must be fully embedded so that no mesh color shows through the base coat when it is dry. Re-skim with additional base coat if mesh color is visible. Allow base coat to thoroughly dry before installing masonry veneer.

F. Masonry Veneer Installation

1. Mark layout lines in accordance with planning: generally taking into account pattern (e.g., running bond, stacked bond, etc.), size of grout joints, location of expansion joints and other start and stopping points of the installation, and aesthetics.
2. Use the proper size notched trowel for application:
 - a. Thin brick units up to $\frac{5}{8}$ inch (16mm) thick: $\frac{1}{4}$ x $\frac{3}{8}$ x $\frac{1}{4}$ inch (6x10x6mm) square notched trowel.
 - b. Thin brick units up to 2 inch (51mm) thick: $\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{2}$ inch (13x13x13mm) U-shaped or square notched trowel.
3. Spread the adhesive with flat side of the trowel to "wet-out" the prepared substrate. Then use the notched side of the trowel to spread additional adhesive with ribbons of adhesive oriented horizontally. Apply in a small area and immediately install thin brick before a "skin" forms on the adhesive. If adhesive skins, remove and discard the skinned adhesive, and re-apply fresh adhesive.
4. Just prior to placing units "back-butter" the units by applying fresh adhesive onto the back of the units in a thin layer with the flat side of the trowel, or with a margin trowel so it "wets out" the surface.
5. Immediately place units slightly offset from their final position in the freshly applied wall adhesive, then slide into place while applying firm pressure to fully bed the units in the adhesive so no voids exist in the adhesive. Use a straight edge to check for evenness of the surface when installing thin brick.
6. As units are placed, periodically remove a unit to verify full contact of adhesive with the substrate and the back of the unit, and full embedment (no voids) in the adhesive.
7. Before the adhesive dries scrape out any excess mortar in the grout joints or on the surface of the units. Allow to cure for at least 24 hours before grouting/pointing.

G. Grouting/Pointing Mortar Installation

1. Use an ANSI 118.7 compliant grout or pointing mortar in conformance with the manufacturer's instructions.

3.6 PROTECTION

- A. Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry
- B. Provide protection of installed materials from water infiltration, mechanical or other damage during and after construction

3.7 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 Guide ([reStore Program](#)) for detailed information on maintenance and restoration – cleaning, recoating, resurfacing and refinishing, or re-cladding
- D. Attic Stock: as part of the contract documents, purchase and leave with the owner [insert no.] of thin brick units of specific texture and color, which will be used later in case finish has to be repaired after the installation is complete

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