



Building with conscience.

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Sto Guide Specification 9000R StoVentec™ Render

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 Render to vertical above grade exterior or interior wall construction, ceilings, or soffits. StoVentec Render is a drained, back-ventilated rainscreen wall system from a single source that incorporates a continuous air and water-resistive barrier, continuous noncombustible mineral wool insulation, and sub-construction for an architectural finish system (render) applied to a carrier board that is manufactured from recycled glass.

PART 1 GENERAL

1.1 SUMMARY

- A. Provide air and water-resistive barrier, continuous noncombustible mineral wool insulation, sub-construction, recycled glass carrier board, and architectural finish system components
- B. Related Sections *(add/delete, depending on specific project requirements)*
 - 1. Section 05 40 00: Cold-Formed Metal Framing
 - 2. Section 06 16 00: Sheathing
 - 3. Section 07 21 00: Thermal Insulation
 - 4. Section 07 26 00: Vapor Retarders
 - 5. Section 07 27 00: Air Barriers
 - 6. Section 07 50 00: Membrane Roofing
 - 7. Section 07 62 00: Sheet Metal Flashing and Trim
 - 8. Section 07 80 00: Fire and Smoke Protection
 - 9. Section 07 90 00: Joint Protection
 - 10. Section 08 10 00: Doors and Frames
 - 11. Section 08 40 00: Entrances, Storefronts, and Curtain Walls
 - 12. Section 08 50 00: Windows
 - 13. Section 09 25 13: Acrylic Plastering

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. Prepare and submit project-specific engineering calculations
- F. 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 Rain Screen Wall Cladding Systems
- B. ASTM Standards

C612	Standard Specification for Mineral Fiber Block and Board Thermal insulation
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
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

C. NFPA Standards

NFPA 220	Standard on Types of Building Construction
NFPA 285	Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

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: $L/360$
- 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. Joint requirements:
 1. at existing movement joints in back-up wall construction
 2. at through wall joints in back-up wall construction
 3. at dissimilar back-up wall construction (e.g., frame wall to masonry wall)
 4. at floor line deflection joints in steel frame construction
 5. at floor lines in multi-level wood-frame construction

6. at intervals of not more than 82 feet (25m) in the field of walls with length to width ratio not in excess of 2.5 to 1

NOTE: when using dark colors (LRV < 50) decrease the span between joints to accommodate thermal expansion and contraction. Decrease joint spacing as needed to accommodate render application in discrete panels and to avoid cold joints.

7. at junctions or abutments to dissimilar building components – windows, doors, alternative facade materials, pipe, scupper and similar through wall penetrations
8. Size joints in accordance with anticipated movement
9. Indicate location of joints, accessories and accessory type on architectural drawings

1.5 PERFORMANCE REQUIREMENTS

NOTE: For detailed performance, test results and criteria, refer to StoVentec Render Testing Summary

A. Air and Water-Resistive Barrier

1. Vapor permeable air and water-resistive barrier in compliance with ASTM E2178 allowable air leakage of 0.004 cfm/ft² (0.02 L/s/m²) and ASTM E2357 allowable air leakage of 0.04 cfm/ft² (0.2 L/s/m²)
2. 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 E136 and C612 Type IV 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 - Sto Lamella - nominal 8.5 lb/ft³ (136kg/m³) density, minimum 4 in (102mm) 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 – Sto Lamella, nominal 8.5 lb/ft³ (136kg/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. StoVentre Brackets –

- a. Steel: Small (GP) and Large (FP), 2.0mm (~1/16in) thickness, Zn-Al-Mg galvanized steel (HSLAS-F Gr 80 + ZM115),
 - b. Aluminum: Small (GP) and Large (FP), 3.2mm (1/8 in)-4.2mm (3/16 in) thickness, 6063-T66 aluminum alloy
2. Profiles - Minimum 2.0mm (~1/8in) Type 6063 T-66 or 6005A-T5 aluminum alloy T-Profiles and L-Profiles
- 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 (0.12 W/m·K) consisting of 90%+ recycled glass content
- G. Architectural Finish System
1. ASTM E2568, Table 1, compliant finish system, consisting of ready mixed acrylic-based high build base coat, treated glass fiber reinforcing mesh, nominal 6 oz/yd² (203.4 g/m²), and acrylic-based textured finish.

1.6 QUALITY ASSURANCE

A. Manufacturer Requirements

1. Air and water-resistive barrier, insulated wall cladding, and architectural finish system manufacturer for a minimum of thirty-five (35) years
2. Manufacturing facilities: ISO 9001:2015 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 water-resistive barrier, curtain wall and rainscreen wall 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. Mock-up Testing

1. Construct full-scale mock-up of typical air/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 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.

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 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. 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 water-resistive 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 water-resistive 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 water-resistive 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 water-resistive 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 ten-year warranty

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide air and water-resistive barrier, sub-construction, carrier board, finish system components, and accessories from single source manufacturer or approved supplier
- B. The following are acceptable manufacturers:
 - 1. Sto Corp. – air and water-resistive barrier, sub-structure, lamella, carrier board, finish system components, and accessories
 - 2. Rockwool – mineral wool insulation
 - 3. Rolf Kuhn – flexible intumescent tape

2.2 AIR AND WATER-RESISTIVE BARRIER

Note: Select any of the listed joint treatment/rough opening protection/detail component options and top coat with one of the listed air and water-resistive barrier coatings

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 Water-Resistive Barrier Coating
 - a. Sto AirSeal® – ready mixed vapor permeable air and water-resistive barrier coating for concrete, concrete masonry, brick masonry, wood-based sheathing, cementitious sheathing, and glass mat gypsum sheathing
 - b. Alternatives:
 - a. Sto Gold Coat® – ready mixed vapor permeable air and water-resistive barrier coating for concrete, concrete masonry, brick masonry, wood-based sheathing, cementitious sheathing, and glass mat gypsum sheathing
 - b. Sto VaporSeal® – fluid-applied Class 1 vapor retarder and air and water-resistive membrane for concrete, concrete masonry, brick masonry, wood-based sheathing, cementitious sheathing, and glass mat gypsum sheathing
3. Static or Dynamic Transition Detail Component: sheathing to foundation, dissimilar materials (e.g. CMU to frame wall), wall to balcony floor slab or ceiling, or other detailing in above grade wall construction
 - a. StoGuard® Conformable Membrane – self-adhered membrane flashing, rough opening protection, sheathing joint treatment, and transition detailing material

2.3 INSULATION BOARD

- A. Rockwool Cavityrock® mineral wool insulation board in conformance with ASTM C612, Type IV requirements, nominal 4.3 lb/ft³ density (0.28 kg/m³), and R-4.3 per inch (RSI - 0.74 per 25mm)
 1. Minimum 2 inch for construction Types I-IV

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. Sto Lamella mineral wool insulation board in conformance with ASTM C612, Type IV requirements, nominal 8.5 lb/ft³ density (136.2 kg/m³), and R-3.2 per inch (RSI - 0.56 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. Sto Lamella mineral wool insulation board in conformance with ASTM C612, Type IV requirements, nominal 8.5 lb/ft³ density (136.2 kg/m³), and R-3.2 per inch (RSI - 0.56) 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™ Brackets –

Note: select bracket metal type and depth(s)

- a. Steel: Small (GP) and Large (FP), Zn-Al-Mg galvanized steel: 60-360mm depths (20mm increments)
 - b. Aluminum: Small (GP) and Large (FP): 40-320mm depths (20mm increments)
- B. StoVentro™ T-Profile and L-Profile – 2.0mm (~1/16in) aluminum vertical and horizontal profiles
 - C. Sto Ventro™ Sub-construction Screw – 5.5x19mm or 22mm (~3/16 x ¾ or 7/8in) S8 stainless steel hex head fasteners for securing StoVentro T-Profiles and L-Profiles to StoVentro Brackets

2.6 CARRIER BOARD

- A. StoVentec Carrier Board (12mm [~1/2in])

2.7 ACCESSORIES

- A. Sto Joint Sealing Tape 2D for inside corner terminations or junctures with dissimilar materials
- B. Sto Starter Profile PH-K for support of insulation board at base of wall

- C. Sto Edge Protection Profiles (G, GT, GF) with integral glass fiber reinforcing mesh 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. Sto Drip Edge Profile with integral glass fiber reinforcing mesh for soffit returns
- F. StoVentre 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
- G. Sto Roof Vent Profiles (G-Roof Vent, G-Rain Guard) for protecting exposed edge of carrier board or venting at top of wall
- H. Sto Ventilation Profile (ALU 30/40, ALU 40/100) for ventilation at base of wall
- I. Stainless steel flashing, trim and corners (by others)
- J. Aluminum Trims and accessories (by others)
- K. Stainless steel fasteners for mounting brackets to steel stud, wood stud, concrete, or concrete masonry back-up wall construction (by others)
- L. Fasteners, impaling pins, or other attachment devices for mounting insulation, floor line fire break materials (by others)
- M. StoSeal STPE Sealant - high-movement, medium modulus, non-sag one-component silyl-terminated polyether joint sealant in compliance with ASTM C920 (Type S, Grade NS, Use NT, A, M, Class 100/50) and tested in accordance with ASTM C1382

2.8 ARCHITECTURAL FINISH SYSTEM: STO RENDER

- A. Base Coat - StoArmat Classic plus ready mixed acrylic-based fiber reinforced plaster
- B. Reinforcement
 - 1. Sto Mesh 6oz – nominal 6 oz/yd² (203.4 g/m²) glass fiber reinforcing mesh treated for compatibility with Sto materials

Note: primer component is optional, except for some Sto Specialty Finishes; refer to the applicable Sto finish Product Bulletin

- C. Primer – StoPrime acrylic-based sanded primer

Note: select one finish

- D. Finish
 - 1. Stolit® ready mixed acrylic-based integrally colored textured finish or other Sto approved textured finish
 - 2. Stolit® Lotusan® ready mixed finish with self-cleaning properties (Lotus-Effect™ Technology)
 - 3. Stolit® ready mixed acrylic-based integrally colored textured finish with StoColor® Dryonic® top-coat applied in two coats for speed drying of façades and enhanced resistance to algae, mold, and mildew.

E. StoCast resin shapes

Note: alternatives to Finish options, select one shape

1. StoCast Brick
 - a. Sto Bonding and Pointing Mortar integrally colored organic mortar
 - b. StoCast Brick lightweight, flexible resin cast brick
2. StoCast Wood
 - a. StoCast Wood Adhesive one component adhesive compatible with multiple substrates
 - b. StoCast Wood lightweight, flexible resin cast wood grain planks
 - c. StoColor® Wood Stain acrylic-based stain topcoat over StoCast Wood

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 water-resistive barrier, sub-construction, insulation board, carrier board, coatings, or finish system 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.

3.5 INSTALLATION

- A. Install air and water-resistive barrier, continuous insulation, sub-construction, carrier board, and finish system with accessories in conformance with manufacturer's written instructions. Refer to StoGuard Installation Instructions and StoVentec Application Guide, and StoVentec Design Guide and Detail Booklet

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 and Maintenance Guide](#) for detailed information on 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 pails of specific texture and color, which will be used later in case finish has to be repaired or touched up after the installation is complete

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