



Building with conscience.

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## Sto Guide Specification 9000G StoVentec Glass

### 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 Glass to vertical above grade exterior wall construction or to interior walls. StoVentec Glass is an open joint drained and back-ventilated rainscreen wall system from a single source that incorporates a continuous air and water-resistive barrier, continuous noncombustible mineral wool insulation, sub-construction, and a pre-fabricated opaque glass panel assembly.*

*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 water-resistive barrier, continuous noncombustible mineral wool insulation, sub-construction, and pre-fabricated opaque glass panel assembly
- 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

### **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
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 Wall Assemblies Containing Combustible Components

### 1.4 DESIGN REQUIREMENTS

*NOTE: Coordinate this section with other material specification sections and detail drawings as applicable.*

- A. Allowable deflection normal to the plane of the wall for back-up wall construction:  $L/300$
- B. Comply with allowable whole building air leakage requirement of [\[insert air leakage resistance\]](#)
- C. Comply with applicable design wind pressure requirements of [\[insert design wind pressure\]](#)
- D. Comply with fire-resistive design requirements of [\[insert hourly fire-resistance rating\]](#)
- E. Comply with applicable U-value requirements of [\[insert U-value\]](#)

### 1.5 PERFORMANCE REQUIREMENTS

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

- A. Air and Water-Resistive Barrier
  - 1. Vapor permeable air and water-resistive barrier in compliance with ASTM E2178, with material air leakage of less than  $0.004 \text{ cfm/ft}^2$  ( $0.02 \text{ L/s/m}^2$ ), and ASTM E2357, with assembly air leakage of less than  $0.04 \text{ cfm/ft}^2$  ( $0.2 \text{ L/s/m}^2$ )
  - 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 ASTM C612 Type IV requirements with 0 flame spread and 0 smoke development when measured in accordance with ASTM E84
- C. Composite Fire Break
1. Sto Lamella - nominal 8.5 lb/ft<sup>3</sup> (136kg/m<sup>3</sup>) density non-combustible mineral wool insulation, minimum 4in (~100mm) tall lamella strip (fibers oriented perpendicular to wall), faced with intumescent tape, nominal 75 lb/ft<sup>3</sup> (1200 kg/m<sup>3</sup>) flexible intumescent material of exfoliated graphite that foams up under influence of pressure and temperature
- D. 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)
- E. Dual Barrier Fire Break
1. Sto Lamella - nominal 8.5 lb/ft<sup>3</sup> (136kg/m<sup>3</sup>) 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
- F. Sub-Construction
1. StoVentro 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. Minimum 2.0mm (~1/8in) Type 6063 T-66 or 6005A-T5 aluminium alloy T-profiles and L-Profiles
- G. Pre-Fabricated Glass Panel Assembly
1. 6mm or 8mm (~1/4 or 5/16in) tempered and heat soaked security glass, fully bonded with silicone adhesive to 15 or 20mm (~9/16 or ~13/16in) carrier board comprised of 92% recycled expanded glass granulate or perlite with required Type 6063-T66 or 6005A-T5 carrier profile attached and accompanying agraffe profile for mounting to sub-construction [\[insert glass type and color as specified by architect or owner from manufacturer's sample selection\]](#)
- H. Service Temperature Limit
1. The Pre-Fabricated Glass Panel Assembly has a service temperature limit of -40°F (-40°C) to 212°F (100°C).

## 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 9001:2015 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 of glass panels; sill flashing, copings, jamb closures, and joints sealant type(s) and location

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 wet products (pail products) in a dry area and protect from extreme heat, 90 degrees F (32 degrees C), freezing, and direct sunlight

- C. 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.

## 1.8 PROJECT/SITE CONDITIONS

- A. Provide a secure staging area for storage of sub-construction components and glass panels to protect from damage
- B. Provide supplementary heat for installation of coating (pail products) in temperatures less than 40°F (4°C)
- C. Provide supplementary heat for installation of sub-construction and glass panels 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 installed 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 horizontal agraffe profiles at required locations and mount glass panel assembly as designated in shop drawings with required joint spacing
- L. Install sill flashings, copings, jamb closures, and sealant immediately after installation of the glass panel assembly
- M. Attach penetrations at pre-determined locations and through pre-designated factory formed holes in the glass panel assembly to structural support

- N. Provide airtight and watertight seals to the air and water-resistive barrier and to the glass panel assembly.

## 1.10 WARRANTY

- A. Provide manufacturer's standard warranty

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Provide air and water-resistive barrier, sub-construction, and pre-fabricated glass panel assembly from single source manufacturer or approved supplier
- B. The following are acceptable manufacturers:
  - 1. Sto Corp. – air and water-resistive barrier, sub-construction, lamella, and glass panel assembly
  - 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 or rough opening protection and 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, wood-based 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 membrane and air and water-resistive barrier coating 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/ft<sup>3</sup> density (0.28 kg/m<sup>3</sup>), and R-4.3 per inch (RSI - 0.74 per 25mm)
  - 1. Minimum 2 inch for construction Types I-IV
  - 2. Optional – Cavityrock Black for camouflaging the mineral wool at open panel joints

## 2.4 FLOOR LINE FIRE STOP

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

- A. 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/ft<sup>3</sup> density (136.2 kg/m<sup>3</sup>), 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)
- B. 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)
- 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/ft<sup>3</sup> density (136.2 kg/m<sup>3</sup>), 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

1. For camouflaging the aluminum profiles at panel joints, add black direct-to-metal paint (prior to hanging glass panels)

### C. StoVentro™ 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 WALL PANEL

*Note: wall panel comes with StoVentro Panel/Carrier Profile for mounting to sub-construction*

### A. StoVentec Glass Panel – pre-fabricated panel with 6mm or 8mm opaque, heat soaked and tempered security glass fully bonded with silicone adhesive to Sto Carrier Board A+, and StoVentro Panel/Carrier Profile attached to the back

## 2.7 ACCESSORIES

### A. StoVentro Agraffe Profile – horizontal profile attached to vertical StoVentro T-Profiles that mates with StoVentro Panel Profile attached to the back of the StoVentec Glass Panel assembly

1. For camouflaging the aluminum profiles at panel joints, add black direct-to-metal paint (prior to hanging glass panels)

### B. StoVentro 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, and for attaching horizontal StoVentro Agraffe Profiles to vertical StoVentro T-Profiles

### C. StoVentro Adjustment Screw – stainless steel fastener for leveling of StoVentec Glass Panel assembly

### D. Stainless steel flashing, trim and corners (by others)

### E. Aluminum trims and accessories (by others)

### F. Sto Ventilation Profile – perforated aluminum accessory for use at the base of the wall or at window heads to permit air flow and block insects and debris from entering the ventilation cavity

### G. Sto Aluminum Starter Track Profile – L-shaped accessory for use at the base of the wall to support continuous insulation starter course

### H. Stainless steel fasteners for mounting brackets to steel stud, wood stud, concrete, or concrete masonry back-up wall construction (by others)

- I. Fasteners, impaling pins, or other attachment devices for mounting insulation, floor line fire break materials (by others)
- J. StoSeal STPE Sealant - high-movement, low 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

## PART 3 EXECUTION

### 3.1 ENGINEERING AND SHOP DRAWINGS

- A. Cladding sub-contractor shall provide engineering and shop drawings identifying structural attachments to back-up wall construction, air and water-resistive barrier components and transition materials and connections for air barrier continuity, location and type of fire breaks, layout of sub-construction components (including fixed or sliding point brackets) and connections (fixed or sliding point), and glass panel locations and joint spacing, sill flashing, copings, jamb closures, and joint sealant type(s) and location

### 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, insulation board, sub-construction, or glass panel assembly 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, and glass panel assembly in conformance with manufacturer's written instructions. Refer to StoGuard Installation Instructions, StoVentec Application Guide, and StoVentec Design Guide and Detail booklet.

### 3.6 PROTECTION

- A. Provide protection of installed wet component 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 installation

### 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.
- 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. Attic Stock: as part of the contract documents, purchase and leave with the owner [\[insert quantity and specific sizes and colors\]](#) pre-fabricated glass panels for use at a later date in case a panel is broken after the installation is complete

#### 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).