



Building with conscience.

Sto Corp.

3800 Camp Creek Parkway

Building 1400, Suite 120

Atlanta, GA 30331

Tel: 404-346-3666

Toll Free: 1-800-221-2397

Fax: 404-346-3119

www.stocorp.com

Sto Guide Specification 9000FC StoVentec™ Fiber Cement

Section 07 46 46

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 Fiber Cement to vertical above grade exterior or interior wall construction, ceilings, or soffits. StoVentec Fiber Cement 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 high-density, noncombustible fiber cement.

PART 1 GENERAL

1.1 SUMMARY

- A. Provide air and water-resistive barrier, continuous noncombustible mineral wool insulation, sub-construction, high-density fiber cement with installation 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

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 or pre-engineering via accredited third party code compliance report(s)
- 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
C1186	Specification for Flat Fiber-Cement Sheets
E84	Test Method for Surface Burning Characteristics of Building Materials
E119	Method for Fire Tests of Building Construction and Materials
E136/E2652	Standard Test Method for Assessing Combustibility of Materials using a Vertical Tube Furnace at 750°C
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

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

D. Florida Building Code – Test Protocol HVHZ

1. Testing Application Standard (TAS) 201, 202, 203 – HVHZ Test Procedures

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

- Allowable deflection normal to the plane of the wall for back-up wall construction: L/240
- Comply with allowable whole building air leakage requirement of [insert air leakage resistance]
- Conform with applicable design wind pressure requirements of [insert design wind pressure]
- Conform with fire-resistive design requirements of [insert hourly fire-resistance rating]
- Comply with applicable U-value requirements of [insert U-value]
- 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 junctions or abutments to dissimilar building components – windows, doors, alternative facade materials, pipe, scupper and similar through wall penetrations
7. Size joints in accordance with anticipated movement (typical 8-10mm (3/8"))
8. 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 the StoVentec Statement of Testing and applicable code reports

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 fiber cement board
2. Composite Fire Break – Sto Lamella Mineral Wool – Nominal 8.5lb/ft³ (136.2 kg/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 – Sto Lamella nominal 8.5lb/ft³ (136.2 kg/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 fiber cement

E. 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. Profiles - Minimum 2.0mm (~1/8in) Type 6063 T-66 or 6005A-T5 aluminum alloy T-Profiles and L-Profiles
- F. StoVentec Fiber Cement
- 1. ASTM C1186 Type A, Grade IV compliant nominal 5/16 or 3/8 inch (8 or 10mm) fiber-cement panel with nominal density of 100 lb/ft³ (1600 kg/m³) and consisting of Portland cement, silica sand, wollastonite, and cellulose fibers.

1.6 QUALITY ASSURANCE

A. Manufacturer Requirements

- 1. Air and water-resistive barrier, insulated wall cladding 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. If not following prescriptive/pre-engineered pathways, 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 containers bearing manufacturer's name and identification of product. Store material inside in a dry, flat area on pallets until ready for use. For prolonged storage, remove at least part of the plastic overwrap to allow for ventilation. Condensation, rain, stagnant water exposure to stored panels may cause product damage. During installation, store panels flat, off the ground on pallets in a dry location.
- B. Do not stack pallets more than two high.
- C. Panels must be carried on edge. Improper handling can cause panel damage. When lifting panels from a stack, do not pull or drag them off the stack as this will scratch the finish on the panel surface below. Always lift individual panels straight up off the stack.
- D. Panels are pre-finished. Avoid contact with soil and exposure to substances that may dirty or mar the finish. Keep panels clean during the installation process with a soft, microfiber type cloth and/or vacuuming. Rinse with low-pressure water hose stream after installation.

1.8 PROJECT/SITE CONDITIONS

- A. Provide a secure staging area for storage of sub-structure components, fiber-cement, and accessories, to protect from damage
- B. Provide supplementary heat for installation of sub-construction in temperatures less than 25°F (-3.8°C)
- C. Provide protection of surrounding areas and adjacent surfaces as needed

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 system warranty

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide air and water-resistive barrier, sub-construction, fiber-cement panels, 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, mineral wool fire barrier, fiber-cement panels, 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® or Cavityrock Black 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 thickness for construction Types I-IV is required to satisfy code requirements for NFPA 285 with respect to combustible AWRBs.

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 fiber-cement panel
- 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 fiber cement (field applied over insulation – 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: 40-360mm depths (20mm increments) (1-9/16 to 14-3/16” in 13/16” 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. 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 horizontal Agraffe Profiles to vertical T/L Profiles

2.6 FIBER-CEMENT CLADDING PANELS

- A. StoVentec Fiber Cement – min. 1600 kg/m³ density, compliant with ASTM C1186 Type A, Grade IV and ASTM E136/2652
1. Primara Line (PL) –
 - a. Finish options: grey body with opaque surface finish (smooth with light sanding) or integral color with hydrophobation
 - b. Thickness 8 or 10 mm (5/16 or 3/8 in.)
 - c. Dimensions 4 x 8 feet (1220 x 2440mm) or 4 x 10 feet (1220 x 3050mm)
 - d. Color(s):
 2. Strata Line (SL) – Integral colored body with extra-smooth, opaque surface finish
 - a. Thickness 8 or 10 mm (5/16 or 3/8 in.)
 - b. Dimensions 4 x 8 feet (1220 x 2440mm) or 4 x 10 feet (1220 x 3050mm)
 - c. Color(s):

2.7 ACCESSORIES

- A. Sto Starter Profile PH-K for support of insulation board at base of wall
- B. Visible Fastening – *select one type*
 - 1. StoVentec Fiber-Cement Screw - 5.5x25mm (~3/16 x 1in) 16mm dome head fasteners for fiber-cement to profile connections
 - a. Centering Sleeves – 11/8mm fixed point and sliding point for 11mm (7/16”) pre-drilled panel holes
 - 2. StoVentec Fiber-Cement Rivet – 5x18mm SSO D-15mm dome head fasteners for fiber-cement to profile connection
 - a. Fixed point sleeves - 9.9x7.7mm - for 10mm (13/32”) pre-drilled panel holes
- C. EPDM foam tape (*required for visible fixing options*) – 1 in. width x 1/8 in. thick – self-adhered to StoVentro L and T Profiles
- D. Concealed Fastening (*10mm thick fiber-cement required, fabrication service required*)
 - 1. StoVentec Fiber-Cement Hidden Anchor – SFS TUF-S 6x9 for 7mm pre-drill
 - 2. StoVentro Carrier Profile Hangers – 4” (102mm) wide aluminum profiles affixed to the rear surface of a fiber-cement panel with TUF-S 6x9 hidden anchors
 - 3. StoVentro Agraffe Profiles – 9’-10” (3m) horizontal aluminum profiles anchored to vertical StoVentro L and T Profiles
- E. Sto Ventilation Profile (ALU 30/40, ALU 40/100) for ventilation at base of wall
- F. Stainless steel flashing, trim and corners (by others)
- G. Aluminum Trims and accessories (by others)
- 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, 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

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

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, fiber-cement 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, fiber-cement with accessories in conformance with manufacturer's written instructions. Refer to StoGuard Installation Instructions and StoVentec Fiber Cement Application Guide, and StoVentec Fiber Cement Design Guide and Detail Booklet

3.6 PROTECTION

- A. Fiber-cement panels are fully pre-finished. During installation, provide protection of materials from dust, dirt, and precipitation
- 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. A vacuum with a soft-tipped hose attachment or clean microfiber cloths may be used to remove dust. After installation, mild household detergents may be used along with low-pressure water hose stream for deeper cleaning and rinsing.
- 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 fiber-cement panels for use at a later date in case a panel is broken after the installation is complete

ATTENTION

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