Code Compliance Research Report
CCRR-0454

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DIVISION: 07 THERMAL AND MOISTURE PROTECTION
Section: 07 42 00 - Wall Panels
Section: 07 42 43 - Composite Wall Panels

REPORT HOLDER:
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REPORT SUBJECT:
StoVentec Render and StoVentec Masonry Veneer Exterior Rainscreen Cladding Systems

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2024, 2021, 2018 *International Building Code®* (IBC)
- 2024, 2021, 2018 *International Residential Code®* (IRC)
- 2023 *Florida Building Code* (FBC) (see Section 9)
- 2025, 2022 *California Building Code* (CBC) (see Section 9)
- 2023 and 2020 *Los Angeles Building Code* (LABC) (see Section 9)

NOTE: This report references the most recent Code editions cited. Section numbers in earlier editions may differ.

1.2 The StoVentec Render and StoVentec Masonry Veneer exterior cladding systems have been evaluated for the following properties (see Table 1):

- Physical properties
- Weather-resistance
- Wind resistance
- Surface burning characteristics
- Ignition resistance
- Fire propagation

1.3 The StoVentec Render and StoVentec Masonry Veneer exterior cladding systems have been evaluated for the following uses (see Table 1):

- Use as exterior cladding complying with IBC Chapter 14 and IRC Chapter 7
- Use in fire-resistance-rated construction
- Use as interior finish complying with Chapter 8 of the IBC
- Use in all Types of construction (Types I, II, III, IV, and V)

2.0 STATEMENT OF COMPLIANCE

The StoVentec Render and StoVentec Masonry Veneer exterior cladding systems comply with the Codes listed in Section 1.1, for the properties stated in Section 1.2, and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.0.

3.0 DESCRIPTION

3.1 StoVentec Render: This system consists of Sto base coat, Sto glass fiber mesh reinforcement and either Sto finish coatings or factory cast finishes applied over the Sto Carrier Board A+ substrate. Sto Carrier Board A+ is attached to a Sto sub-construction that is anchored to a structural base wall protected with StoGuard® air & water-resistive barrier.

Components of the wall assembly include (from inside to outside) (see Figure 1):

- Base wall assembly complying with applicable Code requirements
- StoGuard air and water-resistive barrier
- StoVentro® sub-construction – StoVentro T and L profiles, StoVentro brackets, and StoVentro screw fasteners
- Exterior insulation
- Sto Carrier Board A+ substrate attached with StoVentro façade screws
- Sto Base Coat – Sto BTS Plus or Sto Armat Classic Plus
- Sto Reinforcing Mesh
- Sto Finishes: Stolit or StoCast Wood

3.2 StoVentec Masonry Veneer: This system consists of a Sto base coat and Sto glass fiber mesh applied over the Sto Carrier Board A+ substrate. Sto Carrier Board A+ is attached to a Sto sub-construction that is anchored to a structural base wall protected with StoGuard air and water-resistive barrier. Manufactured stone or thin brick tiles are adhered to Sto Carrier Board A+ with a Sto adhesive mortar.

Components of the wall assembly include (from inside to outside) (see Figure 2):

- Base wall assembly complying with applicable Code requirements
- StoGuard air and water-resistive barrier
- StoVentro sub-construction – StoVentro profiles, StoVentro brackets, and StoVentro screw fasteners
- Exterior insulation
- Sto Carrier Board A+ substrate attached with StoVentro façade screws
- Sto Base Coat – Sto Primer/Adhesive
- Sto Reinforcing Mesh
- StoColl adhesive mortar
- Manufactured stone veneer or thin brick tiles adhered to the base coat

3.3 Components:

3.3.1 StoVentro Sub-construction: The sub-construction consists of 304 or 316Ti stainless steel, S550GD-Zn-Mg galvanized steel or 6063-T6 aluminum brackets, and 6063-T6 or 6005A-T5 aluminum T-profiles and L-profiles supplied by Sto Corp. The brackets are minimum 5/64 in. stainless steel, 2mm galvanized steel or 1/8 in. aluminum x 2-3/4 – 12-5/8 in. sliding point brackets and 7/64 in. stainless steel, 2mm galvanized steel or 1/8 in. aluminum x 2-3/4 – 12-5/8 in. fixed point brackets. The T-profiles have a 7/64 in. x 3-35/64 in. plate and 3/32 x 2 in. leg and are furnished in lengths up to 9 ft-10 in. Bi-metal self-drilling hex-head screws with washers are used to attach the brackets to steel frame wall construction. Screws of equivalent strength may be used to attach to concrete or solid core concrete masonry wall construction provided pull-out or withdrawal capacity is adequate to resist wind loads. Sub-construction screws used to attach T-profiles to brackets are SDA5 #12 x 7/8 in. stainless steel self-drilling hex-washer-head screws, or equivalent.

3.3.2 Carrier Board A+: The substrate board is a proprietary sheathing product supplied by Sto Corp. The boards are supplied in nominal 4x8 ft. and 32 in. x 48 in. sheets at a nominal 1/2 in. thickness.

3.3.3 Water-resistive Barrier: The water-resistive barrier is one of the following:

- StoGuard Vaporseal R – a fluid-applied polymeric coating, spray or roller-applied in a two-coat process at a wet film thickness of minimum 16 mils per coat. See ICC-ES ESR-1233.
- Sto Gold Coat – a fluid-applied polymeric coating, spray or roller-applied in one coat at a wet film thickness of minimum 10 mils. See ICC-ES ESR-1233.
- Sto AirSeal – a fluid-applied polymeric coating, spray or roller-applied in one coat at a wet film thickness of minimum 40 mils. See ICC-ES ESR-1233.
- The Sto water-resistive barriers are supplied in 5-gallon pails and have a shelf life of 12 months when properly sealed and stored in a dry area at temperatures between 40° and 90°F.

3.3.4 Base Coat: Base coat materials identified in Section 3.1 and 3.2 are applied at a nominal wet thickness of 1/8 in. to embed the Sto Reinforcing Mesh. Sto Armat Classic Plus and Sto Primer/Adhesive are supplied in 5-gallon pails and Sto BTS-Plus is supplied in 47-lb bags. They have a shelf life of 12 months when properly sealed and stored in a dry area at temperatures between 40° and 90°F.

Sto Armat Classic Plus is applied at a rate of 50 to 60 ft^2 per pail, Sto BTS Plus is applied at a rate of 80 to 125 ft^2 per bag, and Sto Primer/Adhesive is applied at a rate of 165 to 210 ft^2 per pail when mixed with Type 1 Portland cement.

3.3.5 Reinforcing Mesh: Reinforcing mesh is packaged in cartons containing 4 x 150 ft. rolls of mesh per carton and has a shelf life of 24 months when properly sealed and stored in a dry area.

3.3.6 Adhesives:

3.3.6.1 StoCast Wood Adhesive is used to adhere StoCast Wood to the base coat. The adhesive is applied at a rate of 130 to 150 ft^2 per pail. The adhesive is supplied in 5-gallon pails and has a shelf life of 12 months when properly sealed and stored in a dry area at temperatures between 50° and 85°F.

3.3.6.2 StoColl Adhesive Mortar is used to adhere manufactured stone or thin brick to the base coat. It is applied at a rate of 40 to 50 ft^2 per bag. The mortar is supplied in 50-lb bags and has a shelf life of 12 months when properly sealed and stored in a dry area at temperatures between 50° and 85°F.

3.3.7 Finishes:

3.3.7.1 Stolit: Stolit finish is supplied in 5-gallon pails and has a shelf-life of 18 months when properly sealed and stored in a dry area at temperatures between 40° and 90°F. Stolit is applied at a nominal thickness of 1/16 in.

3.3.7.2 StoCast Wood: StoCast Wood are 6 in. wide x 6 ft. long planks supplied in cartons with 75 planks per carton. StoCast Wood is stored off the ground in a dry location at temperatures between 50° and 85°F and must be installed within one year of manufacture.

3.3.7.3 StoColor Wood Stain: StoColor Wood Stain is supplied in 5-gallon pails and has a shelf life of 12 months when properly sealed and stored at temperatures between 50° and 85°F. StoColor Wood Stain is applied in two coats at a rate of 1150 to 1400 ft^2 per pail, per coat.

3.3.7.4 Masonry Veneer: Manufactured stone veneer must comply with ICC-ES AC51. Thin brick veneers must comply with ASTM C1088. Maximum thickness, dimensions, and weight of masonry veneer are 2-5/8 in. thick for manufactured stone and 1-3/4 in. thick for thin brick, 36 in. in any face dimension and 5 ft^2 in total face area, and weight of 15 lb/ft^2.

4.0 PERFORMANCE CHARACTERISTICS

4.1 StoVentec Render:

4.1.1 Wind Resistance: When installed in accordance with Table 2 of this report, the system has an allowable wind resistance as described in Table 3.

4.1.2 Flame Spread Characteristics: The Stolit finish has a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84. StoCast Wood installed with StoCast Wood Adhesive and finished with StoColor Wood Stain has a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84.

4.1.3 Fire Resistance: Installation of the system over existing loadbearing or non-loadbearing wall assemblies will maintain the fire resistance rating of the wall assembly.

4.1.4 Ignition Resistance: When installed in accordance with this report, the system complies with NFPA 268 when exposed to a heat flux not less than 12.5kW/m^2.

4.1.5 Fire Propagation: When installed in accordance with this report, the system complies with the acceptance criteria of NFPA 285 for use on buildings required to be of Types I, II, III, or IV construction. See Section 5.3.

4.2 StoVentec Masonry Veneer:

4.2.1 Wind Resistance: When installed in accordance with Table 2 of this report, the system has an allowable wind resistance as described in Table 3.

4.2.2 Flame Spread Characteristics: StoColl Adhesive Mortar with masonry veneer and grout complying with ANSI 118.7 has a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84.

4.2.3 Fire Resistance: Installation of the system over existing loadbearing or non-loadbearing wall assemblies will maintain the fire resistance rating of the wall assembly.

4.2.4 Ignition Resistance: When installed in accordance with this report, the system complies with NFPA 268 when exposed to a heat flux not less than 12.5 kW/m^2.

4.2.5 Fire Propagation: When installed in accordance with this report, the system complies with the acceptance criteria of NFPA 285 for use on buildings required to be of Types I, II, III, or IV construction. See Section 5.3.

5.0 INSTALLATION

5.1 General: The StoVentec Render and StoVentec Masonry Veneer exterior cladding systems must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this research report.

A copy of the manufacturer's instructions must be available on the jobsite during installation.

5.2 Application: The wall assembly must be constructed as illustrated in Figure 1 or 2 and as described in Table 2.

5.3 Walls of Types I, II, III, and IV Construction: The walls must be constructed as illustrated in Figure 1 or 2 and as described in Table 2.

5.4 Special Inspections: Special inspections in accordance with IBC Section 1705.1.1 are required for application of the water-resistive barrier (see Section 3.3.3), except when the installation is done by an installer or contractor trained by Sto Corp. and a certificate of installation is presented to the Code Official at the completion of the project.

6.0 CONDITIONS OF USE

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

6.2 With the exception of the exterior insulation, wall brackets, vertical profiles and masonry veneer, components of the StoVentec Render and StoVentec Masonry Veneer cladding systems are manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.

7.0 SUPPORTING EVIDENCE

7.1 Reports of tests in accordance with ASTM C297, C482, E330, E331, G155, E84, E119, E2485, D2247, B117, E2486, E2568, NFPA 285, NFPA 268.

7.2 Data in accordance with applicable sections of the ICC-ES Acceptance Criteria for Facade and Wall Cladding Systems with Porcelain, Ceramic or Terra Cotta Panels (AC504) dated October 2018.

7.3 Intertek Listing Report "StoVentec Render and StoVentec Masonry Veneer Exterior Veneer Rainscreen Cladding Systems", on the Intertek Directory of Building Products.

8.0 IDENTIFICATION

Components of the StoVentec Render and StoVentec Masonry Veneer systems that are manufactured by Sto Corp. are identified with the manufacturer's name (Sto Corp.), the product name (See Table 2), the Intertek Mark as shown below, the Intertek Control Number, and the Code Compliance Research Report number (CCRR-0454). Labeling of liquid components also includes the lot or batch number, storage instructions, pot life and expiration date.

9.0 OTHER CODES

9.1 2023 Florida Building Code: When installed in accordance with this report, the StoVentec Render and StoVentec Masonry Veneer Exterior Rainscreen Cladding Systems comply with the 2023 *Florida Building Code - Building* and 2023 *Florida Building Code - Residential*.

9.1.1 StoVentec Render systems may be used in High Velocity Hurricane Zones when installed over minimum 5/8 in. (5-ply) plywood supported by 2x studs or 2x6 – 18 GA metal studs, spaced a maximum of 16 in. on center. Maximum design pressure is 80 psf, positive and negative, based on testing in accordance with TAS 202 and 203.

9.1.2 StoVentec Masonry Veneer systems have not been evaluated for use in High Velocity Hurricane Zones.

9.2 2025, 2022 California Building Code: When installed in accordance with this report, the StoVentec Render and StoVentec Masonry Veneer Exterior Rainscreen Cladding Systems comply with the 2025 and 2022 *California Building Code* and 2022 *California Residential Code*, subject to the following conditions:

- In accordance with CBC Section 1402.2.1, compliance with Chapter 5, Division 5.4 of the California Green Building Standards Code is required.
- Adhered masonry veneer units thicker than 5/8 in. (16mm) may not be used where over exit ways or more than 20 feet in height above adjacent ground elevation.

- For StoVentec Masonry Veneer applications – In accordance with CBC Section 1410.2.1, at least one shear test shall be performed at each building for each 5,000 square feet of floor area or fraction thereof. Not less than two shear tests shall be performed for the adhered veneer between the units and the supporting element. Minimum shear strength shall be 50 psi.
- The system may be installed in exterior wildfire exposure areas under the 2025 *California Wildland-Urban Interface Code*, Section 504.5 when installed over one of the following:
  - Installation over an assembly suitable for exterior fire exposure with a 1-hour fire-resistance rating, rated from the exterior side, as tested in accordance with ASTM E119 or UL 263.
  - An assembly suitable for exterior fire exposure containing one layer of 5/8-in. Type X gypsum sheathing applied behind the exterior wall covering on the exterior side of the framing.
  - An assembly suitable for exterior fire exposure containing any of the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design manual as complying with a 1-hour-rire-resistance rating, as tested in accordance with ASTM E119 or UL 263.

9.3 2023 and 2020 Los Angeles Building Code: When installed in accordance with this report, the StoVentec Render and StoVentec Masonry Veneer Exterior Rainscreen Cladding Systems comply with the 2023 and 2020 *Los Angeles Building Code* and *Los Angeles Residential Code*, subject to the following conditions:

- In accordance with LABC Section 1402.3, in no case shall veneer be considered as part of the wall in computing strength or deflection, nor shall it be considered a part of the required thickness of the wall. Deflection of lateral support of veneer, including wood studs, shall be no greater than h/500.
- Adhered masonry veneer units thicker than 5/8 in. (16mm) may not be used where over exit ways or more than 20 feet in height above adjacent ground elevation.
- For StoVentec Masonry Veneer applications – In accordance with LABC Section 1410.2.1, at least one shear test shall be performed at each building for each 5,000 square feet of floor area or fraction thereof. Not less than two shear tests shall be performed for the adhered veneer between the units and the supporting element. Minimum shear strength shall be 50 psi.
- The system may be installed in exterior wildfire exposure areas under LABC Chapter 7A and LARC Section R337 when installed over a minimum 1-hour fire-resistance-rated assembly as described in Section 9.2.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the https://bpdirectory.intertek.com is recommended to ascertain the current version and status of this report.

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TABLE 1A - PROPERTIES EVALUATED - INTERNATIONAL BUILDING CODES

PROPERTY	2024 IBC SECTION[1]	2024 IRC SECTION[1]
Physical properties	1407.2 1403.10 1404.10	R703.9
Weather resistance	1403.2.4	R703.9, R703.1.1, R703.2
Wind resistance	1407.3	R703.1.2
Surface burning characteristics	803	R302.9
Fire-resistance-rated construction	703.2	R302
Use in Types I, II, III, and IV construction	2603.5	NA

[1]Section numbers in earlier editions of the Codes may differ.

TABLE 1B - PROPERTIES EVALUATED - FLORIDA BUILDING CODES

PROPERTY	2023 FBC - BUILDING SECTION[1]	2023 FBC - RESIDENTIAL SECTION[1]
Design	1405	NA
Physical properties	1408.2 1405.10	R703.9
Weather resistance	1404.2	R703.9, R703.1.1, R703.2
Wind resistance	1408.3	R703.1.2
Surface burning characteristics	803	R302.9
Fire-resistance-rated construction	703.2	R302
Use in Types I, II, III, and IV construction	2603.5	NA
HVHZ	1405.1 1626	R4401.1

TABLE 1C - PROPERTIES EVALUATED - CALIFORNIA BUILDING CODES

PROPERTY	2022 CBC SECTION[1]	2022 CRC SECTION[1]
Physical properties	1403.10 1404.10	R703.9
Weather resistance	1402.2 1403.2	R703.9, R703.1.1, R703.2
Wind resistance	1407.3	R703.1.2
Surface burning characteristics	803	R302.9
Fire-resistance-rated construction	703.2	R302
Use in Types I, II, III, and IV construction	2603.5	NA
Use in exterior wildfire exposure areas	CWUIC	CWUIC

TABLE 1D - PROPERTIES EVALUATED - LOS ANGELES BUILDING CODES

PROPERTY	2023 LABC SECTION[1]	2023 LARC SECTION[1]
Physical properties	1407.2 1403.11 1404.10	R703.9.1.1
Weather resistance	1402.2 1403.2	R703.9.1.1, R703.1.1, R703.2
Wind resistance	1407.3	R703.1.2
Surface burning characteristics	803	R302.9
Fire-resistance-rated construction	703.2	R302
Use in Types I, II, III, and IV construction	2603.5	NA
Use in exterior wildfire exposure areas	707A.4	R337

TABLE 2 – STOVENTEC SYSTEM DESCRIPTIONS (See also Figures 1 and 2)

COMPONENT	STOVENTEC RENDER		STOVENTEC MASONRY VENEER
Base wall construction	Concrete or solid core concrete masonry, or steel frame with gypsum sheathing, or steel frame with code-compliant wood-based sheathing. Framing must be maximum 16-in. oc and must be sized as required for the building design.		
Water-resistive barrier	The base wall construction is covered with one of the liquid-applied water-resistive barriers described in Section 3.3.3.		
Wall brackets	StoVentro Brackets are mounted to the steel framing of the base wall with two #14 x 2-in. SDS screws per bracket. Brackets are placed maximum 6-in. from top and bottom of wall, and spaced maximum 36 inches oc. Each T-profile must be supported by at least one large, fixed point (FP) bracket. Attachment of brackets to concrete or solid core concrete masonry base wall construction must use screws or concrete anchors of equivalent strength to those used for steel frame as determined by engineering analysis. Pull-out or withdrawal capacity from the substrate must be adequate to resist wind loads as determined by proof load testing or engineering analysis.		
Vertical profiles	The StoVentro Aluminum T-profile is attached parallel to the base wall studs to each bracket with two StoVentro Sub-construction SDA5 #12 x 7/8-in. screws.		
Exterior insulation	Mineral wool insulation may be attached to the framed base wall either with adhesively attached 16 ga. impaling pins at a minimum of five locations per 24 in. by 48 in. section, or with #10 x 1-3/8-in. self-tapping bugle-head screws attached to studs, or equivalent method. Thickness shall be min. 2 in., with maximum thickness based on the depth of the wall brackets. The distance between the face of the insulation and the inward side of the Carrier Board A+ substrate must be between 3/8-in. and 2-3/8-in. (10mm and 60 mm).		
Substrate	The Carrier Board A+ substrate board is attached to the vertical profiles with StoVentro screws JT4-STS-3-5, 5x24 (#12 x 1-in.) stainless steel screws located as described in Table 3.		
Base coat	Sto BTS Plus, or Sto Armat Classic Plus	Sto BTS Plus, or Sto Armat Classic Plus	Sto Primer/Adhesive (field mixed with Type 1 portland cement)
Reinforcing Mesh	Sto Mesh	Sto Mesh	Sto Mesh
Finish coat	Stolit Finish	StoCast Wood adhered with StoCast Wood Adhesive and coated with StoColor Wood Stain	Code compliant manufactured stone or thin brick tiles adhered with StoColl Adhesive Mortar

TABLE 3 – ALLOWABLE WIND LOADS
(with construction as described in Table 2)

Fasteners spacing for attachment of Carrier Board A+	Allowable Wind Loads (psf)	
	Negative	Positive
6	80	80
8	60	80
12	42	80

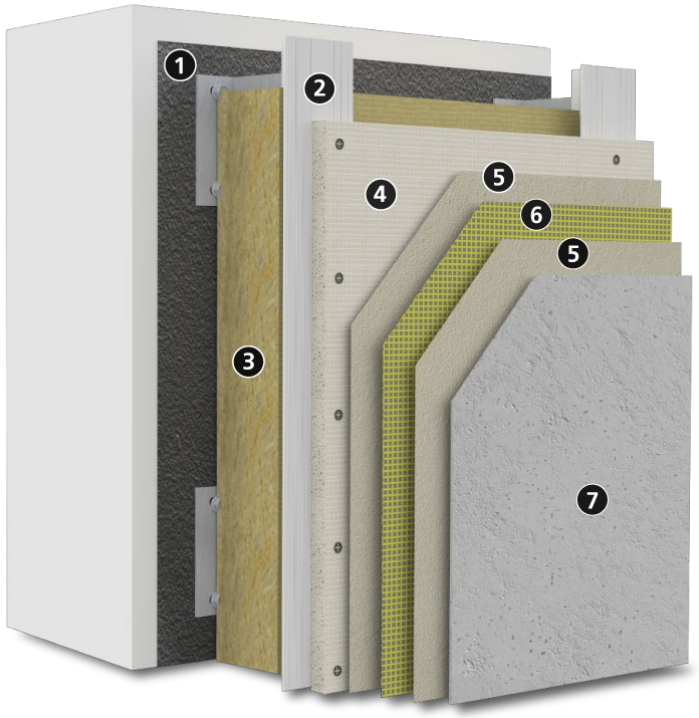

Figure 1 – StoVentec Render System

Component	Description
1	StoGuard water-resistive barrier
2	StoVentro wall brackets and vertical profiles
3	Exterior insulation
4	Sto Carrier Board A+ substrate
5	Sto base coat
6	Sto reinforcing mesh
7	Sto finish – textured finish or factory cast finish

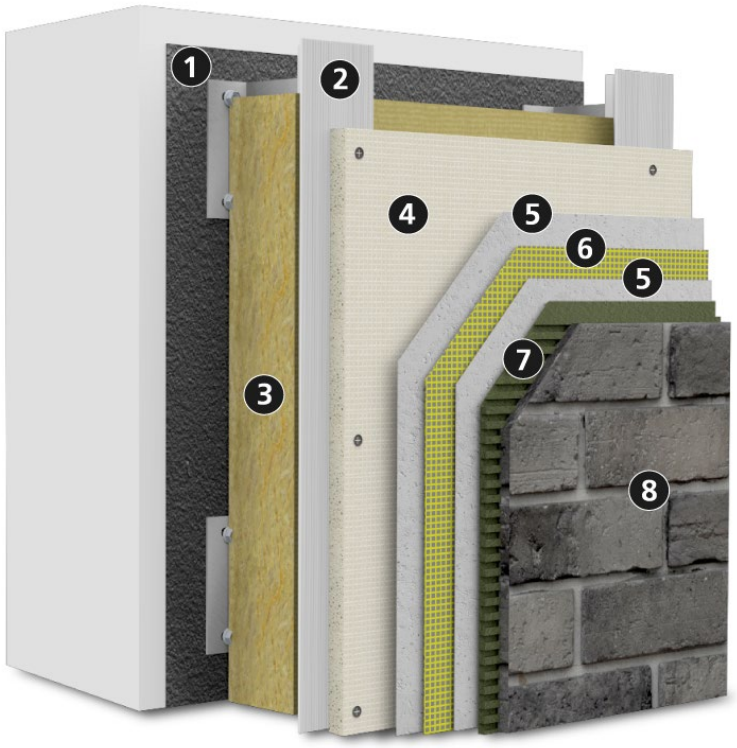

Figure 2 – StoVentec Masonry Veneer System

Component	Description
1	StoGuard water-resistive barrier
2	StoVentro wall brackets and vertical profiles
3	Exterior insulation
4	Sto Carrier Board A+ substrate
5	Sto base coat
6	Sto reinforcing mesh
7	Sto adhesive mortar
8	Code compliant manufactured stone or thin brick with grout

Steel, small/GP

Steel, large/FP

Aluminum, small/GP

Aluminum, large/FP

T-profile

Figure 3 – StoVentec Brackets and Aluminum T-Rail