



SonoWall

EIFS & Associated Products Test Results

TECHNICAL BULLETIN



SonoWall EIFS & Associated Products

Test Results

Technical Information

Consult our Technical Services Department for specific recommendations concerning all other applications. Consult the SonoWall website, www.sonowall.basf.com, for additional information about products and systems and for updated literature.

SonoWall FT-T	
Test	Result
Fire Tests: ASTM E84 Surface Burning	Flame spread < 25 Smoke developed < 450 (Class A)
Physical Tests: ASTM E96 Method B Perms Water Vapor Transmission	11.1 Perms (grains/Hr. in Hg. ft ²)
ICBO ES AC 24, SBCCI PST & ESI, ASTM D2247 Water Resistance	No sign of deleterious effects after 14 day exposure (Tested over various substrates)
ICC-ES AC212, ASTM D2247 Water Resistance	No sign of deleterious effects after 14 day exposure (Tested over gypsum sheathing, Dens Glass Gold, cement board)
ICBO ES AC 24, ASTM E331 (Modified) Water Penetration	No water penetration after 75 min at 6.24 psf (Preconditioned in accordance with ASTM E1233)
ICBO ES AC 24, SBCCI PST & ESI Freeze-Thaw	No sign of deleterious effects after 10 cycles (Tested over various substrates)
ICBO ES AC 212 Freeze-Thaw	No sign of deleterious effects after 10 cycles (Tested over gypsum sheathing, Dens Glass Gold, cement board)
ASTM E283 Rate of Air Leakage	.004 cfm/ft ²
ICBO ES, ASTM C297 Tensile Adhesion	21.27 psi (Tested over exterior gypsum sheathing)
SBCCI PST & ESI, ICBO ES, ASTM C297 Tensile Bond (before & after freeze-thaw)	>15 psi avg; No failure of the lamina after 10 cycles freeze-thaw (Tested over various substrates)
ICC-ES AC212, ASTM C297 Tensile Bond	>15 psi avg (Tested over gypsum sheathing, Dens Glass Gold, cement board; pvc and galvanized flashing)
ICC-ES AC212, ASTM E1233, ASTM E72 Structural, Racking and Restrained Environmental Conditioning	Passed with no signs of cracking or tearing in field, at joints or interface of flashing (Tested over gypsum sheathing)
ICC-ES AC212 (UV Exposure, Accel Aging, Hydro Pressure AATCC 127) Weathering Test	No signs of failure after UV and Accel Aging; passed 5 hrs @ 21.7" head water (Tested over exterior gypsum sheathing, Dens Glass Gold, cement board)
Lab Procedure Hydrostatic Head	Pass 12" at 48 hours

SonoWall FT-R

Test	Result
Fire Tests: ASTM E84 Surface Burning	Flame spread < 25 Smoke developed < 450 (Class A)
Physical Tests: ASTM E96 Method B Water Vapor Transmission	5.8 Perms (grains/Hr. in Hg. ft ²) @ 10 mils
ICBO ES AC 24, SBCCI PST & ESI, ASTM D2247 Water Resistance	No sign of deleterious effects after 14 day exposure (Tested over various substrates)
ICC-ES AC212, ASTM D2247 Water Resistance	No sign of deleterious effects after 14 day exposure (Tested over gypsum sheathing, Dens Glass Gold, cement board, OSB, plywood)
ICBO ES AC 24, ASTM E331 (Modified) Water Penetration	No water penetration after 75 min at 6.24 psf (Preconditioned in accordance with ASTM E1233)
ICBO ES AC 24, SBCCI PST & ESI Freeze-Thaw	No sign of deleterious effects after 10 cycles (Tested over various substrates)
ICBO ES AC 212 Freeze-Thaw	No sign of deleterious effects after 10 cycles (Tested over gypsum sheathing, Dens Glass Gold, cement board, OSB, plywood)
ASTM E283 Rate of Air Leakage	.0037 cfm/ft ²
ICBO ES, ASTM C297 Tensile Adhesion	25.38 psi (Tested over exterior gypsum sheathing)
SBCCI PST & ESI, ICBO ES, ASTM C297 Tensile Bond (before & after freeze-thaw)	>15 psi avg; No failure of the lamina after 10 cycles freeze-thaw (Tested over various substrates)
ICC-ES AC212, ASTM C297 Tensile Bond	>15 psi avg (Tested over gypsum sheathing, Dens Glass Gold, cement board, OSB, plywood; pvc and galvanized flashing)
ICC-ES AC212, ASTM E1233, ASTM E72, ASTM E331 Structural, Racking and Restrained Environmental Conditioning	Passed with no signs of cracking or tearing in field, at joints or interface of flashing and no water penetration after 90 min @ 6.24 psf (Tested over 7/16" OSB and 1/2" gypsum sheathing)
ICC-ES AC212 (UV Exposure, Accel Aging, Hydro Pressure AATCC 127) Weathering Test	No signs of failure after UV and Accel Aging; passed 5 hrs @ 21.7" head water (Tested over exterior gypsum sheathing, Dens Glass Gold, cement board, OSB, plywood)

SonoWall EIFS & Associated Products Test Results

SonoWall Wall System Coatings

Test

Result

Fire Tests:

UL 723/ASTM E84

Surface burning characteristics of STUCCOTEX Coatings

Flame spread < 25
Smoke developed < 450

Physical Tests:

ASTM E96 Method B

Perms water vapor transmission of STUCCOTEX Coatings

STUCCOTEX S MEDIUM RILLED Finish with ADHESIVE BASE COAT/REINFORCING MESH 4: 6.53 Perms
MEDIUM RILLED Finish with ADHESIVE BASE COAT/REINFORCING MESH 4: 7.3 Perms
STUCCOTEX S MEDIUM RILLED Finish with PRIMACOAT Base Coat/ REINFORCING MESH 4 & HI-IMPACT 20: 11 Perms
STUCCOTEX MEDIUM RILLED Finish with PRIMACOAT Base Coat/ REINFORCING MESH 4 & HI-IMPACT 20: 11.7 Perms
MEDIUM Finish with PRIMACOAT Base Coat/ REINFORCING MESH 4: 15.1 Perms
STUCCOTEX S MEDIUM SAHARA Finish with PRIMACOAT Base Coat/ REINFORCING MESH 4: 16 Perms
STUCCOTEX BEAD Finish with PRIMACOAT Base Coat/REINFORCING MESH 4: 16.2 Perms
STUCCOTEX COAT/MEDIUM RILLED Finish With PRIMACOAT Base Coat/ REINFORCING MESH 4: 17 Perms
STUCCOTEX S MEDIUM RILLED Finish with PRIMACOAT Base Coat/REINFORCING MESH 4: 18.4 Perms
STUCCOTEX COAT with PRIMACOAT Base Coat/REINFORCING MESH 4: 19.5 Perms
STUCCOTEX S MEDIUM RILLED Finish With ADHESIVE GROUND COAT Base Coat/REINFORCING MESH 4: 21.4 Perms
STUCCOTEX MEDIUM RILLED with ADHESIVE GROUND COAT Base Coat/ REINFORCING MESH 4: 22.4 Perms

ASTM D2247

Water resistance of Coatings in 100% R.H.

No deleterious effects after 14 days exposure.

ASTM B117

Salt fog resistance

No change after 300 hours.

Mil. Std. 810B Method 508

Mildew resistance

No fungus growth after 28 days.

Singapore Test—

SS 345: 1990 (Appendix B)

FINE Finish showed no algae growth after 8 weeks.

Chemical Resistance

(Determined by spot testing the sample surface with turpentine, mineral spirits, and 10% hydrochloric acid for 4 hours).

Turpentine = slight softening
Mineral spirits = slight softening
10% Hydrochloric acid = slight softening

StuccoTex™ Finishes

Test	Result
Fire Tests: ASTM E84 Surface Burning Characteristics	Flame Spread < 25 Smoke Developed < 450
Physical Tests: ASTM D4541 Pull-off adhesion to concrete	200
ASTM D1653 Water Vapor Permeability	Method A = 1.3 dry perms Method B = 23.0 wet perms
ASTM D412 Tensile strength, psi Non-textured film	550
ASTM D412 Elongation, %: Non-textured film	70
TT-C-555B Wind-driven rain (98 mph)	Pass
ASTM G26 Accelerated Weathering, 3000 hours	No cracking, checking, blistering or adhesion loss
ASTM D1308 Chemical resistance	Good resistance to mild acids, alkalis and salts
ASTM D4060 (1,000 cycles), % weight loss	2.7
Freeze-thaw resistance of dry film (25 cycles)	Pass
Dirt Pickup	None

Stuccotex S Finish

ASTM E96 Method B Water vapor transmission of STUCCOTEX S	Maximum average 21.4 perms
Hydrostatic water resistance of STUCCOTEX S	No water penetration with minimum 304 mm (12") head for more than 24 hours.

SonoWall EIFS & Associated Products

Test Results

Stuccolast Coat II Coating	
Test	Results
ASTM D412 Ultimate elongation at break (average), %	500
ASTM D412 Tensile strength, psi	155
ASTM C711 Low temperature flexibility	Passes
ASTM D3273 Fungus and mildew resistance	Total absence of growth
ASTM D1653 Water vapor permeability	Method A - 2.0 dry perms Method B - 19.7 wet perms
ASTM G53 Accelerated Weathering, 4000 hours	No chalking, checking or chalking; color change DE<4.0
TT-C-555B Wind-driven rain (98 mph)	Passes
ASTM B117 Salt spray (fog) testing, hrs	500 plus: no fading, checking or chalking
ASTM E84 Surface Burning Characteristics	Flame Spread <25 Smoke Developed <450

FlexWall System

Test	Result
Fire Tests: Modified ASTM E108	The SonoWall Finish Coat did not contribute significantly to the vertical or horizontal flame spread on the exterior of the wall. The intact Finish Coat and Reinforcing Mesh layers were capable of preventing flame intrusion into the wall cavity. The Finish Coat did not produce significant amounts of smoke during either of the tests. The removal of the Finish Coat and fiberglass mesh layer to expose the foam core did not adversely affect the fire performance of the FlexWall System.
UBC Standard 26-4/NFPA 285 Full Scale Multi-Story Fire Test	The FlexWall System successfully met all of the following criteria: <ol style="list-style-type: none">1. Self-propagating flame did not occur over the exterior facings of the panels.2. Flame propagation did not occur vertically or laterally through the core insulation to the limits of the test panels.3. Flame propagation did not occur to the first floor wall panels that simulate adjacent lateral spaces either through core insulation or over exterior or interior test panel surfaces.4. Temperatures measured 25 mm (1") from the interior surface of test panels within the second story did not exceed 177°C (350°F).5. Flames did not penetrate the second floor either through the wall/floor intersection or on the interior face of the test panels.
UBC Standard 26-9/NFPA 285 Intermediate Scale Fire Test	Successfully met all of the following criteria using 13" thick EPS insulation boards. <ol style="list-style-type: none">1. Self-propagation flame did not occur over the exterior facings of the panels.2. Flame propagation did not occur vertically or laterally through the core insulation to the limits of the test panels.3. Flame propagation did not occur to the first floor wall panels that simulate adjacent lateral spaces either through core insulation or over exterior or interior test panel surfaces.4. Temperatures measured 25 mm (1") from the interior surface of test panels within the second story did not exceed 177°C (350°F).5. Flames did not penetrate the second floor either through the wall/floor intersection or on the interior face of the test panels.
ASTM E119 Method for fire tests of building construction and materials	The FlexWall System did not reduce the fire resistance of the basic wall assembly.
NFPA 268 Radiant heat exposure	Satisfied conditions of acceptance for 13" thick EPS insulation. No ignition upon 20 minute radiant heat exposure at 1.25 w/cm ² .
Impact Tests: ASTM E695 Impact resistance	No cracks in the exterior insulation and finish system from a drop height of 1.83 m (6'). Maximum cumulative indentation did not exceed 8.5 mm (0.33").

SonoWall EIFS & Associated Products

Test Results

Test	Result
EIMA Impact Standard 101.86	<p>REINFORCING MESH 4/PRIMACOAT Base Coat: standard impact resistance</p> <p>INTERMEDIATE 6/PRIMACOAT Base Coat: standard impact resistance</p> <p>INTERMEDIATE 12/PRIMACOAT Base Coat: medium impact resistance</p> <p>INTERMEDIATE 12 & REINFORCING MESH 4/PRIMACOAT Base Coat: high impact resistance</p> <p>STRONG 15 & REINFORCING MESH 4/PRIMACOAT Base Coat: ultra high impact resistance</p> <p>HI-IMPACT 20 & REINFORCING MESH 4/PRIMACOAT Base Coat: ultra high impact resistance</p>
<p>Physical Tests:</p> <p>Dade County Testing Application Standard (TAS) 201 Impact tests (large and small missile)</p> <p>Dade County Testing Application Standard (TAS) 202 Uniform static air pressure tests</p> <p>Dade County Testing Application Standard (TAS) 203 Cyclic wind pressure tests</p>	
<p>Assemblies:</p> <p>FlexWall WM with SonoWall FT-T or SonoWall FT-R with Hi Impact 20 & Reinforcing Mesh 4 over 3 5/8", 18 and 20 gauge steel studs, 1/2" DensGlass Gold or GlasRoc sheathing</p> <p>FlexWall WM with SonoWall FT-T or SonoWall FT-R with Reinforcing Mesh 4 over 3 5/8", 18 and 20 gauge steel studs, 1/2" DensGlass Gold or GlasRoc sheathing</p> <p>FlexWall WM with SonoWall FT-T or SonoWall FT-R with Hi Impact 20 & Reinforcing Mesh 4 over 3 5/8", 18 and 20 gauge steel studs, 1/2" DensGlass Gold or GlasRoc sheathing</p> <p>FlexWall WM with Hi Impact 20 & Reinforcing Mesh 4 over 3 5/8", 18 and 20 gauge steel studs, 1/2" DensGlass Gold or GlasRoc sheathing</p> <p>FlexWall WM with Hi Impact 20 & Reinforcing Mesh 4 over 3 5/8", 18 gauge steel studs with Intermediate 12 on 5/8" DensGlass Gold sheathing</p> <p>FlexWall System with Reinforcing Mesh 4 over CMU block</p> <p>FlexWall WM with SonoWall FT-R with Reinforcing Mesh 4 over 2" x 4" wood studs, 5/8" plywood sheathing</p>	<p>Passed TAS 201 (Large Missile), 202 & 203 +/- 2873 Pa (60 psf) design pressure - 18 gauge +/- 1436 Pa (30 psf) design pressure - 20 gauge</p> <p>Passed TAS 201 (Small Missile), 202 & 203 +/- 2873 Pa (60 psf) design pressure - 18 gauge +/- 1436 Pa (30 psf) design pressure - 20 gauge</p> <p>Passed TAS 201 (Large Missile), 202 & 203 +/- 2873 Pa (60 psf) design pressure - 18 gauge +/- 1436 Pa (30 psf) design pressure - 20 gauge</p> <p>Passed TAS 201 (Small Missile), 202 & 203 +/- 2873 Pa (60 psf) design pressure - 18 gauge +/- 1436 Pa (30 psf) design pressure - 20 gauge</p> <p>Passed TAS 201 (Large Missile), 202 & 203 +/- 3112 Pa (65 psf) design pressure</p> <p>Passed TAS 201 (Large Missile), 202 & 203 +/- 5985 Pa (125 psf) design pressure</p> <p>Passed TAS 201 (Large Missile), 202 & 203 +/- 3591 Pa (75 psf) design pressure</p>
<p>EIMA 101.01 (Modified ASTM C67) Freeze/thaw resistance</p>	No deleterious effects after 60 cycles
<p>Fed. Spec. TT-C-555B Wind driven rain</p>	An average weight gain of 24 grams was sustained without back dampness or leaking through. Tested in full-scale configuration to positive and negative pressures.

Test	Result
ASTM E330 Wind-load	In excess of 7182 Pa (150 psf) without bond failure
ASTM E331 Water penetration of exterior windows, curtain walls, and doors by uniform static air pressure difference	No water penetration to the innermost face of the test specimens occurred at 574 Pa (12 psf) pressure differential
ASTM C297 Tensile Bond Strength	Exceeds 69 kPa (10 psi) on various substrates, including masonry, gypsum sheathing, and wood-based sheathing.
Absorption-Freeze Resistance (Sample subjected to 4 days of water soakage to 60 cycles of 2 hours each at - 10°C and + 20°C)	A weight gain of 0.38 grams was sustained without any visible damage.
Singapore Test— SS 345: 1990 (Appendix B)	FINE Finish showed no algae growth after 8 weeks.

FlexWall with Optional Secondary Air/Water-Resistive Barrier

Physical Tests:

ASTM C297

Tensile bond strength
SONOWALL FT-T/Base Coat/EPS on:

Cement-board	30.1 psi
Dens-Glass Gold	34.5 psi
Exterior gypsum sheathing	24.0 psi

FlexWall WM

Fire Tests:

UBC Standard 26-9/NFPA 285 Intermediate Scale Multi-story Fire Test

Met test criteria with 12" thick EPS insulation.

ASTM E119

Methods for fire tests of building construction and materials

1 hour rating with maximum 4" thick EPS insulation

NFPA 268

Radiant Heat Exposure

Met test criteria with 12" thick EPS insulation.

Physical Tests:

Modified ASTM E331

Pass. No signs of leakage and no significant amount of water on interior of the specimen.

ASTM E330 Wind-load

Assembly description:
Steel stud framing (20 gauge) 16"o.c., 1/2" gypsum sheathing, SHEATHING FABRIC 4 over sheathing joints, SONOWALL FT-R, SonoWall Adhesive, 1" expanded polystyrene insulation board, Sonowall Base Coat, REINFORCING MESH 4, REINFORCING MESH, Sonowall Finish.

Average ultimate loads:
- 3126 Pa (- 65 psf)
+ 2633 Pa (+ 55 psf) not taken to failure

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Test	Result
<p>Assembly description: Wood assembly (2' x 4') 16"o.c., 7/16" Exposure 1 OSB, SHEATHING FABRIC 4 over sheathing joints, SONOWALL FT-R, Sonowall Adhesive, 1" expanded polystyrene insulation board, Sonowall Base Coat, REINFORCING MESH 4, Sonowall Finish.</p>	<p>Average ultimate loads: - 8379 Pa (- 175 psf) + 3591 Pa (+ 75 psf) not taken to failure</p>
<p>EIMA Std 200.2 Drainage Efficiency</p>	<p>99.1% with SonoWall FT-T 98.7% with SonoWall FT-R Meets 90% Minimum</p>

FlexWall WM with Channeled Insulation Boards

<p>Fire Tests: UBC Standard 26-9/NFPA 285 Intermediate Scale Fire Test:</p>	<p>Successfully met all of the following criteria:</p> <ol style="list-style-type: none"> 1. Self-propagation flame did not occur over the exterior facings of the panels. 2. Flame propagation did not occur vertically or laterally through the core insulation to the limits of the test panels. 3. Flame propagation did not occur to the first floor wall panels that simulate adjacent lateral spaces either through core insulation or over exterior or interior test panel surfaces. 4. Temperatures measured 25 mm (1") from the interior surface of test panels within the second story did not exceed 177°C (350°F). 5. Flames did not penetrate the second floor either through the wall/floor intersection or on the interior face of the test panels.
<p>ASTM E119 Methods for fire tests of building construction and materials</p>	<p>1 hour rating with maximum 4" thick EPS insulation</p>
<p>NFPA 268 Radiant Heat Exposure</p>	<p>Met test criteria with 12" thick EPS Insulation</p>
<p>Physical Tests: ASTM E2273 Determining the drainage efficiency performance of Exterior Insulation Finish Systems (EIFS) Clad Wall Assemblies</p>	<p>Pass. No signs of leakage and no significant amount of water on interior the specimen.</p>
<p>ASTM E330 Wind-load Assembly description: Steel stud framing (20 gauge) 16" o.c., 1/2" gypsum sheathing, 4" REINFORCING MESH 4 on sheathing joints, SONOWALL FT-T, Sonowall Adhesive, 1" expanded polystyrene insulation board, Sonowall Base Coat, REINFORCING MESH 4, Sonowall Finish.</p>	<p>Average ultimate loads: - 3112 Pa (- 65 psf) + 4644 Pa (+ 97 psf) (no failure)</p>
<p>EIMA Std 200.2 Drainage Efficiency</p>	<p>99.2% with SONOWALL FT-T 98.7% with SONOWALL FT-R Meets 90% Minimum</p>

Notes

Mixed Sources (Paper)

Product group from well-managed forests, controlled sources and recycled wood or fiber

Note

BASF Wall Systems is an operating unit of BASF Construction Chemicals, LLC. (herein after referred to as "BASF Wall Systems")

Residential Policy

Apply walls systems in accordance with local building codes in force at the time of construction. On one and two-family residential framed construction, BASF Wall Systems requires that the wall system selected be one that includes provisions for moisture drainage. The choices include water drainage EIFS, SonoWall Stucco Wall Systems, and SonoWall Cement-Board Stucco™ Systems. There are no exceptions to this policy. Under no circumstances will BASF Wall Systems warrant the use of any other system on this type of construction without expressed written authorization from BASF Wall Systems [Residential construction using EIFS on masonry (CMU) or poured concrete does not require the additional water drainage provisions described above. SonoWall Exterior Surfacing Systems for insulating concrete forms are also acceptable.]

See the SonoWall Residential Policy Bulletin for a more detailed discussion of this topic. Consult BASF Wall Systems Technical Services Department for specific recommendations concerning all other applications. Consult the SonoWall website, www.sonowall.basf.com for additional information about products and systems and for updated literature.

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