Teifs Testing

Technical Data and Testing

Building Code Evaluation Reports can be found at: www.teifs.com or call 1-800-358-4785

EIFS Wall Systems

Durability Performance

- Abrasion Resistance (ASTM D968): Pass. 1000 L of sand.
- Accelerated Weathering (ASTM G153): No deleterious effects at 5512 hrs.
- Freeze Thaw (ASTM E 2485): No deleterious effects at 60 cycles.
- Mildew-Fungus Resistance (FTMS 6271): No growth.
- Mildew-Fungus Resistance (ASTM D3273): 60 days; no growth.
- Salt Spray Resistance (ASTM B117): No deleterious effects at 600 hours.
- Tensile Adhesion (ASTM E2134): No adhesive failure.
- Water Resistance (ASTM D2247): No deleterious effects at 28 days.
- Water Penetration (IBC 1403.2): Pass 2 hours.

Drainage Performance (ASTM E2273)

Adhesively Attached Insulation Board

- Weathertight (Weatherseal, TeifsDrainboard): 93.9%
- Weathertight VNT(Weatherseal,Vertical notched trowel,flat foam): 98.2%
- Weathertight CB (Weatherseal, Channelboard): 99.2%
- Permadrain PL(Plastic Lath, Flat foam): 97.7%
- Permadrain ML (Metal Lath, Flat foam): 97.8%

Mechanically Attached Insulation Board

- Permadrain (Stuccowrap): 99.3%

International Code Council Evaluation Reports

TeifsFlex, TeifsAirtight: ER-5199

Teifs Drainage Systems: ESR-1935

TeifsOne Coat Stucco: ER-5877

TeifsWeatherseal: ESR-2045

Impact Performance Test (ASTM 2486)

System Containing Mesh	Test Result	Impact Classification
Teifs Mesh 4.8	40 in-lb (4.52 J)	Standard/Level 1
358.6 TeifsMesh	52 in-lb (5.88 J)	Medium/Level 2
358.10 Intermediate impact mesh	104 in-lb (11.75 J)	High/Level 3
358.10 Intermediate impact mesh / Mesh 4.8	148 in-lb (16.72 J)	High/Level 3
358.10 TeifsMesh / 358.10 Intermediate Impact Mesh	200 in-lb (22.6 J)	Ultra-High/Level 4
358.14 High Impact Mesh	240 in-lb (27.12 J)	Ultra-High/Level 4
358.20 Ultra High Impact Mesh	288 in-lb (32.54 J)	Ultra-High/Level 4

Fire Performance

- Standard Test Methods for Fire Tests of Building Construction and Materials (ASTM E 119): Fire resistance rating of one-hour and two-hour wall assemblies was not reduced by the addition of the TeifsFlex Wall System.

- Intermediate Scale Multi-Story Fire Test (NFPA 285/ UBC 26-9, formerly UBC 26-4): Pass as listed below for TeifsFlex, TeifsAirtight, TeifsWeathertight and TeifsWeathertight VNT.
  Interior Surface: One layer of 5/8" or 1/2" thick type X gypsum wallboard (ASTM C 36). **Exterior Sheathing:** One layer of minimum 5/8" Type X or 1/2" thick water-resistant core gypsum sheathing (ASTM C 79).
  Trowelable Weather Barrier (Optional): TeifsWeatherseal.
  Insulation: TeifsBoard or TeifsDrainboard:
  1. Resistant to vertical spread of flame within the core of the panel from one story to the next. **2.** Resistant to flame propagation over the exterior surface. **3.** Resistant to vertical spread of flame over the interior surface from one story to the next. **4.** Resistant to significant lateral spread of flame from the compartment of fire origin to adjacent spaces.

- Radiant Heat Exposure Test (NFPA 268): Meets requirement for unrestricted fire separation distance.
  No flaming at 12.5 KW/m^2 heat flux exposure.

Technical Data and Testing

EIFS Components
Durability Performance

Expanded Polystyrene Insulation Board:
- Physical Properties EPS (ASTM E2430): Meets Type I
- Density (ASTM C1622): .95lb/cu. ft. (15.2 kg/cu. m.)
- "R" value of 1.00 in. (25.4 mm) thick (ASTM C177) at 75 °F (23.9 °C): 3.85 F·ft²·h/Btu (.67 K·sq. m./w)
- Tensile strength (ASTM D1623): 15 psi (103 kPa)
- Flexural strength: 25 psi (173 kPa)
- Shear modulus (ASTM C273): 400 psi (2758 kPa)
- Water vapor permeance (ASTM E 96): 5 perms (287 ng/Pa·s·sq. m.)
- Water absorption: 4.0%
- Dimensional stability: 2.0%
- Oxygen index: volume 24%
- Flame spread/ Smoke developed (ASTM E84): 25/450 max

Reinforcing Mesh:
- Alkali Resistance of Reinforcing Mesh (ASTM 2098): Retained tensile strength.

TeifsWeatherseal:
- Air Infiltration (ASTM E283): 008cfm/.004L/s
- Tensile Bond (ASTM E2134): Passes. (Exterior Gypsum, Dens-Glass Gold, Durock, Glasroc, Plywood, and OSB).
- Water Penetration: Pass
- Freeze Thaw (ASTM E2485)(10 cycles): No deleterious effects, blistering, erosion on Exterior Gypsum, Dens-Glass Gold, Durock, Plywood, or OSB.
- Water Resistance (ASTM D2247): No deleterious effects, blistering, erosion.
- Structural, Racking and Restrained Environmental Conditioning TestI (AC 212): Pass for use under any cladding
- Weathering Test: (Accelerated Aging, UV Exposure, Hydrostatic Pressure Test:) (AC 212): Pass

Adhesive Tensile Bond (ASTM C 297)

Teifs Base:
- Gypsum Sheathing (ASTM C1396): 28 psi
- USG Aqua-Tuff Sheathing: 26 psi
- GP Dens-Glass Gold (ASTM C1177): 15 psi
- Concrete Masonry Unit: 19 psi
- Durock: 27 psi
- Hardie Board: 22 psi
- BPB Celotex Glasroc (ASTM C1177): 32 psi

TeifsAdheez:
- Gypsum Sheathing (ASTM C1396): 27 psi
- OSB: 28 psi
- GP Dens-Glass Gold (ASTM C1177): 27 psi
- Plywood Sheathing: 22 psi
- BPB Celotex Glasroc (ASTM C1177): 28 psi

TeifsFlex Finish
- Accelerated Weathering (ASTM G153): No deleterious effects-5512 hours.
- Abrasion Resistance (ASTM D968): 1000 Liters of sand - Pass.
- Freeze Thaw (ASTM 2485): No deleterious effects at 60 cycles.
- Mildew-Fungus Resistance (FTMS 6271): No growth.
- Mildew-Fungus Resistance (ASTM D3273): 4 weeks; No growth.
- Salt Spray Resistance (ASTM B117): No deleterious effects at 600 hours.
- Water Penetration (ASTM E331): No water penetration after 45 minutes at 12 psf.
- Water Resistance (ASTM D2247): No deleterious effects at 14 day exposure.

TeifsLastic
- Elongation (ASTM D412): 473%
- Flexibility (ASTM C522) 1/8 in. Mandrel/180
- Hardness (ASTM D2240): 21 days.
- Mildew-Fungus Resistance (Federal Test 141, 6241): No growth.
- Salt Spray Resistance (ASTM B117): 500 hours.
- Tensile Strength (ASTM D412): 200 psi.
- Wind Driven Rain (Federal Test TT-C-555 B): 24 hours.

TeifsOne-Coat Durability Performance
- Accelerated weathering (ASTM G23): 2000 hours - Pass
- Freeze Thaw (ICBO AC-11): 10 Cycles, no cracking etc.
- Water Resistance (ASTM D2247): Pass

Fire Performance

Surface Burning Characteristics of Building Materials (ASTM E84)
- EIFS Components: Flame spread ≤ 25 Smoke developed ≤ 450
- TeifsWeatherseal: Flame spread ≤ 10 Smoke developed ≤ 10
- Potential Heat of Building Materials (NFPA 259): EPS = 17,425 Btu/lb

Technical Data and Testing

EIFS Structural Performance Test (ASTM E 330)

Framing		Sheathing			Weather Resistive Barrier	Attachment Method of Insulation	Insulation Thickness (inches)	Average Ultimate Wind Load Capacity	
Metal Min. Gauge	Spacing (inches on center)	Type	Thickness (inches)	Screw Spacing (inches)				Neg. (PSF)	Pos. (PSF)
20	16	Gypsum Board	1/2	6	Weatherseal optional	Fully Ahered	3/4	-95	110
20	16	Gypsum Board	1/2	6	Weatherseal optional	Fully Adhered to lath	3/4	-94	117
20	24	Gypsum Board	5/8	6	Weatherseal optional	Fully Adhered	3/4	-68	81
20	16	Gypsum Board	1/2	6	Building Papers Optional	Mechanically Attached	3/4	-60	108
20	16	Gypsum Board	1/2	6	Weatherseal	Fully Adhered	1-1/4 Channel Board	-66	85
20	16	Gypsum Board	1/2	6	Weatherseal	Fully Adhered	1-1/2 DrainBoard	-74	84
18	16	Gypsum Board	1/2	6	Weatherseal optional	Fully Adhered	3/4	-89	217
18	24	Gypsum Board	1/2	6	Weatherseal optional	Fully Ahered	3/4	-60	138
18	16	Gypsum Board	1/2	6	Building Papers Optional	Mechanically Attached	3/4	-82	103
18	16	Gypsum Board	15/32	6 perimeter 12 field	Building Papers Optional	Mechanically Attached 8/board	1	-118	79
18	16	Gypsum Board	15/32	6 perimeter 12 field			1-1/2	-130	82
18	16	Gypsum Board	15/32	6 perimeter 12 field			2	-130	83
18	16	Gypsum Board	15/32	6 perimeter 12 field		Mechanically Attached 9/board	1	-89	79
18	16	Gypsum Board	15/32	6 perimeter 12 field		Mechanically Attached 8/board	1-1/2	-114	79
16	16	Gypsum Board	1/2	6	Weatherseal optional	Fully Adhered	3/4	-89	213

Framing Member	**Spacing** (inches on center)	**SHEATHING**			**WEATHER RESISTIVE BARRIER (optional)**	**ATTACHMENT METHOD OF INSULATION**	**INSULATION THICKNESS (in)**	**ULTIMATE WIND LOAD CAPACITY (PSF)**	
		Type	**Thickness** (in)	**Screw Spacing** (inches on center)				Neg.	Pos.
Wood	16	Wood	7/16	6	Building Papers	Mechanically Attached	1-1/2″ DrainBoard	-87	174
Wood	16	Wood	7/16	6	Building Papers	Mechanically Attached	1-1/4″ ChannelBoard	-93	172
Wood	16	Gypsum Board	1/2	6	Weatherseal	Fully Adhered	3/4	-113	143
Wood	16	Gypsum Board	5/8	6	Weatherseal	Fully Adhered	3/4	-109	135
Wood	24	Gypsum Board	1/2	6	Weatherseal	Fully Adhered	3/4	-74	114
Wood	24	Gypsum Board	5/8	6	Weatherseal	Fully Adhered	3/4	-78	118

Teifs One-Coat Structural Performance

FRAMING		**SHEATHING**			**Lath**	**AVERAGE ULTIMATE WIND LOAD CAPACITY (PSF)**	
Type	**Spacing** (inches on center)	**Type**	**Thickness** (in)	**Screw Spacing** (inches on center)		Neg. (PSF)	Pos. (PSF)
Wood	16	Polyisocyanurate Insulation	1/2	6	20 ga.	-90	120
Wood	24	EPS	1	24	20 ga.	-145	165
20 ga. Steel	16	Gypsum Board	5/8	24	20 ga.	-125	87
Wood	24	Gypsum Board	5/8	24	20 ga.	-137	87

Technical Data and Testing
Teifs One-Coat Stucco One-Hour Fire Rated Assemblies

First Assembly:
Interior Face: One layer of 5/8-in. thick (15.9 mm), Type X gypsum wallboard complying with ASTM C36, water resistant backer board or veneer base is applied parallel or at right angles to the interior face of 2-by-4 wood studs (minimum specific gravity of 0.50, such as Douglas fir) spaced 24 in. (610 mm) on center, maximum. The wallboard is attached with 6d coated nails, 1 7/8 in. (48 mm) long, with 1/4-inch-diameter (6.4 mm) heads, at 7 in. (178 mm) on center, to studs, plates and blocking. Horizontal wallboard joints must be backed with minimum 2-by-4 wood framing. Wallboard joints must be taped and, along with fastener heads, treated with joint compound.

Exterior Face: One layer of minimum 5/8-in. thick (15.9 mm), Type X, water-resistant core gypsum sheathing complying with ASTM C79, 48 in. (1219 mm) wide, is applied parallel to studs with No. 11 gauge, galvanized roofing nails, 1 3/4 in. (44.5 mm) long with 7/16 (11.1 mm) or 1/2-in. diameter (12.7 mm) heads, at 4 in. (102 mm) on center at board edges and 7 in. (178 mm) on center at intermediate studs. The sheathing is nailed to top and bottom plates at 7 in. (178 mm) on center. A weather-resistive barrier is required over the sheathing. The lath and wall coating, without installation board, are then applied.

Second Assembly:
Interior Face: One layer of minimum 5/8-in. thick (15.9 mm), Type X gypsum wallboard, conforming to ASTM C36, is applied vertically to minimum 2-by-4 wood studs (minimum specific gravity of 0.50, such as Douglas fir) spaced 24 in. (610 mm) on center, maximum. Minimum 2-by-4 blocking is required between studs spaced up to 60 in. (1524 mm) on center. Wallboard is attached with 1 5/8-in. long (41 mm), 5d wallboard nails spaced 8 in. (203 mm) on center around the board edges and connected to studs and blocking. All wallboard joints must be backed with minimum 2-by-4 wood framing or blocking and must be taped and treated with joint compound. Fastener heads must also be treated with joint compound. The stud cavities shall be filled with R-11 fiberglass insulation batts having a minimum density of 0.5 pcf (8.01 kg/cu. m.), R-11 Rockwool batt insulation having a minimum density of 1.45 pcf (23.2 kg/cu. m.), or cellulose insulation complying with CPSC 16 CFR, Parts 1209 and 1404, and having a minimum density of 2.6 pcf (41.65 kg/cu. m.).

Exterior Face: One layer of minimum 1/2-in. thick (12.7 mm), V-edge gypsum sheathing complying with ASTM C79 is applied horizontally to wood framing. The sheathing is temporarily fastened in place with 1 5/8-in. long (41 mm), 5d wallboard nails spaced 12 in. (305 mm) on center around the board edges and connected to studs and blocking. A weather-resistive barrier is required over the sheathing. Minimum 2.5-lbs./sq. yd. (0.95 kg/cu. m.) metal lath is then attached to all framing members with roofing nails or staples specified in Section 2.3.2, spaced 6 in. (152 mm) on center. Teifs One Coat Stucco (Dry) is then applied to a 3/8-in. (9.5 mm) thickness.

Third Assembly:
Interior Face: One layer of minimum 5/8-in. thick (15.9 mm), Type X gypsum wall board complying with ASTM C36 attached horizontally to 2-by-4 wood studs spaced a maximum of 24 in. (610 mm) on center with 1 5/8-in. long (41.3 mm) galvanized steel cupped-head drywall nails [head diameter of 0.30 in. (7.62 mm)] spaced at 8 in. (203 mm) on center along all studs and runners. All wallboard joints must be blocked. The joints shall be taped and, along with nail heads, treated with joint compound. The stud cavities shall be filled with R-11 fiberglass insulation batts having a minimum density of 0.5 pcf (8.01 kg/cu. m.).

Exterior Face: One layer of minimum 7/16-in. thick OSB sheathing attached to wood framing with 8d coated sinker nails, 2 3/8 in. long (60 mm), spaced at 8 in. (203 mm) over all studs and plates. Two layers of Grade D building paper as described in Section 2.2.11 are required over the sheathing. One layer of wire fabric lath described in Section 2.2.5.1 is applied over the OSB and fastened with galvanized No. 16 gauge, 1 1/4-in. crown (31.7 mm) staples having 1.25-in. long (31.7 mm) legs spaced at 6 in. (152 mm) on center along all studs and perimeters. The Teifs One Coat Stucco (Dry) is then applied at a nominal 3/8-in. thickness.

Fourth Assembly:
Interior Face: Same as Assembly 3

Exterior Face: The wood studs are covered with two layers of Grade D building paper. One-in. thick (25.4 mm) Type II EPS board, having a nominal density of 1.5 pcf and recognized in ICBO ES evaluation report PFC-5680, is attached to studs with 1 7/8-in. long (48 mm) galvanized steel roofing nails [head diameter = 0.375 in. (9.5 mm), shaft diameter = 0.125 in. (3.2 mm)] spaced at 12 in. (305 mm) on center along all studs and plates. One layer of wire fabric lath described in Section 2.2.5.1, with a minimum of 2-in. (51 mm) overlap between pieces, is applied over the EPS insulation board and fastened with electrogalvanized No. 16 gauge, 1 3/4-in. crown (44.5 mm) staples having 1.75-in. long (44.5 mm) legs spaced at 6 in. (152 mm) on center along all studs and perimeters. The Teifs One Coat Stucco (Dry) is then applied at a nominal 3/8-in. thickness.

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