

## NFPA 285 Tested Assemblies Using Foam Sheathing

June 21, 2011

### Introduction:

The 2009 *International Building Code (IBC)* contains a provision in [Section 2603.5](#) that requires wall assemblies in multi-story buildings that contain foam plastic insulating sheathing to be tested in accordance with NFPA 285 – *Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components*. The specific provision follows (see [Appendix](#) for full context):

**2603.5 Exterior walls of buildings of any height.** *Exterior walls* of buildings of Type I, II, III or IV construction of any height shall comply with Sections 2603.5.1 through 2603.5.7.

**2603.5.5 Test standard.** The wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

**Exception:** One-story buildings complying with Section 2603.4.1.4.

**2603.4.1.4 Exterior walls—one-story buildings.** For one-story buildings, foam plastic having a flame spread index of 25 or less, and a smoke-developed index of not more than 450, shall be permitted without thermal barriers in or on *exterior walls* in a thickness not more than 4 inches (102 mm) where the foam plastic is covered by a thickness of not less than 0.032-inch-thick (0.81 mm) aluminum or corrosion-resistant steel having a base metal thickness of 0.0160 inch (0.41 mm) and the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

### Issue:

In addition, some concern has been raised with respect to the direction the *International Energy Conservation Code (IECC)* is moving in to require more continuous insulation on the exterior walls of buildings. Specifically, the question is, “How many wall assemblies with continuous insulation are available that meet the requirements of the NFPA 285 test?”

### Analysis:

The following tables list the products that have ICC-ESR Reports. These products are approved for use in exterior walls of buildings of Type I, II, III or IV construction of any height and can be used in assemblies requiring NFPA 285 tests as specified in the individual reports.

### Foam Sheathing

ICC-ES Report Number	Type of Application	Manufacturer	Product
1061	Foam Plastic Insulating Panels	Owens Corning Corporation	FOAMULAR® 150, 250, 400, 600, and 1000 Extruded Polystyrene Insulation Boards
1962	Foam Plastic Insulating Panels	Atlas EPS, A Division of Atlas Roofing Corp.	Falcon Foam®, ThermalStar® and Elevation™ Expanded Polystyrene Insulation Boards, Staccato™ T & G Board (T & G I, T & G II, T & G IIR), X-Grade® TalonGUARD EPS, Staccato™ EIFS, ThermalStar D2D, and ThermalStar Underlayment
2142	Foam Plastic Insulating Panels	The Dow Chemical Company	Styrofoam™ Brand Insulation Boards and Dow Fan-Fold Products
NER681	Foam Plastic Insulating Panels	The Dow Chemical Company	Thermax™ Brand Insulation Boards

Table 1: Foam Sheathing

View all FSC Tech Matters at [www.foamsheathing.org/techmatters.php](http://www.foamsheathing.org/techmatters.php)

Foam Sheathing Coalition • 750 National Press Building • 529 14<sup>th</sup> Street, NW • Washington, DC 20045  
202/785-3232 • 202/223-9741 (fax) • [www.foamsheathing.org](http://www.foamsheathing.org)

## Spray Applications

ICC-ES Report Number	Type of Application	Manufacturer	Product
2642	Spray Applied	BASF Polyurethane Foam Enterprises, LLC	BASF Polyurethane Foam Enterprises Spray-Applied Insulations: SPRAYTITE® (158,178,81205 and 81206); COMFORT FOAM® (158 and 178) and WALLTITE® (US and US-N)
1615	Spray Applied	NFCI Polyurethanes	InsulStar® and InsulBloc® Spray-Applied Polyurethane Insulations
1655	Spray Applied	Bayer Material Science, LLC	Bayseal™ OC Spray-applied Polyurethane Insulation
2072	Spray Applied	Bayer Material Science, LLC	Bayseal™ CC and Bayseal™ CC Polar Spray-applied Polyurethane Foam Insulations
2642	Spray Applied	BASF Polyurethane Foam Enterprises, LLC	BASF Polyurethane Foam Enterprises Spray-Applied Insulations: SPRAYTITE® (158,178,81205 and 81206); COMFORT FOAM® (158 and 178) and WALLTITE® (US and US-N)
2670	Spray Applied	Dow Chemical, Inc.	STYROFOAM™ Spray Polyurethane Foam RS2030, RS2045, RS2060, CM2030, CM2045, CM2060, MX2030, MX2045, MX2060
3086	Spray Applied	Johns Manville	JM Open Cell Spray Foam

Table 2: Spray Applications

## EIFS Systems

ICC-ES Report Number	Type of Application	Manufacturer	Product
1878	EIFS	BASF Construction Chemicals, LLC-Wall Systems	Senerflex® Channeled Adhesive Design and Channeled Insulation Design Exterior Finish and Insulation Systems (EIFS)
1794	EIFS	BASF Construction Chemicals, LLC-Wall Systems	Chemicals, LLC-Wall Systems Senergy Senerflex®, Senergy Senturion™ and Senergy Senerthik® Exterior Insulation and Finish Systems (EIFS)
2163	EIFS	BASF Construction Chemicals, LLC-Wall Systems	Sonowall™ FlexWall, Sonowall™ PM Wall and Sonowall™ FlexWall WM Exterior Insulation and Finish Systems (EIFS)
2164	EIFS	BASF Construction Chemicals, LLC-Wall Systems	Acrocrete® Acrowall-ES, Acrowall-PM and Acrowall-ESV Exterior Insulation and Finish Systems (EIFS)
2165	EIFS	BASF Construction Chemicals, LLC-Wall Systems	Finestone® Pebbletex, Pebbletex-D and Impact-R Exterior Insulation and Finish Systems (EIFS)
2186	EIFS	BASF Construction Chemicals, LLC-Wall Systems	Finestone® Pebbletex-DCA and Pebbletex-DCA with Channeled Insulation Exterior Insulation and Finish System (EIFS)
2187	EIFS	BASF Construction Chemicals, LLC-Wall Systems	SonoWall™ FlexWall WM and FlexWall WM with Channeled Insulation Exterior Insulation and Finish System (EIFS)
2188	EIFS	BASF Construction Chemicals, LLC-Wall Systems	Acrocrete® Acrowall-ES Plus and Acrowall-ES Plus with Channeled Insulation Exterior Insulation and Finish System (EIFS)
2358	EIFS	BASF Construction Chemicals, LLC-Wall Systems	SonoWall™ CBWall 500 System and SonoWall™ CBWall System
2359	EIFS	BASF Construction Chemicals, LLC-Wall Systems	Acrocrete® Acrowall-CBS 500 System and Acrocrete® Acrowall-CBS System
2357	EIFS	BASF Construction Chemicals, LLC-Wall Systems	Finestone® Finescreen 500 System and Finestone® Finescreen 1000 System
2022	EIFS	BASF Construction Chemicals, LLC-Wall Systems	Senergy® Cement-Board Stucco™ 500 System and Senergy® Cement-Board Stucco™ 1000 System
2000	EIFS	Corev America	Corev PRECOR and PRECOR-SB Exterior Insulation And Finish Systems (EIFS)
1232	EIFS	Dryvit Systems, Inc.	Dryvit Outsulation Exterior Insulation and Finish System

ICC-ES Report Number	Type of Application	Manufacturer	Product
1821	EIFS	Dryvit Systems, Inc.	Dryvit Outsulation® MD System® Exterior Insulation and Finish System (EIFS)
1543	EIFS	Dryvit Systems, Inc.	Dryvit Outsulation Plus MD Exterior Insulation and Finish System (EIFS)
1693	EIFS	Dryvit Systems, Inc.	Dryvit Infinity® Exterior Insulation and Finish System
1181	EIFS	Master Wall Inc.	Master Wall EIF Systems: Aggre-flex Class PB EIFS, Aggre-flex Class PB Drainage EIFS, Rollershield Drainage Class PB EIFS and QRW1 Drainage EIFS
2064	EIFS	Omega Products International, Inc.	Akroflex Barrier Exterior Insulation and Finish System
2035	EIFS	Omega Products International, Inc.	AkroFlex Water Managed and Water Managed Plus Exterior Insulation and Finish System
2562	EIFS	Parex USA, Inc.	Parex WaterMaster DB System and Parex Standard WaterMaster System
2563	EIFS	Parex USA, Inc.	Parex Standard System
2861	EIFS	Parex USA, Inc.	TeifsFlex and TeifsAirtight Systems
1720	EIFS	Sto Corporation	StoTherm Essence EIFS, StoTherm Classic EIFS and StoTherm Premier EIFS
1748	EIFS	Sto Corporation	StoTherm Essence NExt®, StoTherm Classic NExt®, and StoTherm Premier NExt® Exterior Insulation and Finish System
1030	EIFS	Sto Corporation	Sto RainScreen and Sto RainScreen II Class PB Exterior Insulation and Finish Systems with Drainage
1935	EIFS	Teifs by ParexLaHabra	Teifs PERMADRY, TeifsWEATHERTIGHT and TeifsPERMADRAIN Wall Systems
1936	EIFS	UltraKote Products, Inc	ShurKote Wall Systems EIFS and Tivoli Stone EIFS

Table 3: EIFS Systems

In addition, the Extruded Polystyrene Foam Association (XPSA) has sponsored several NFPA 285 fire tests on various exterior wall systems that incorporated extruded polystyrene foam plastic insulation. These tests were successful and met the requirements of NFPA 285. The test configurations are detailed in the following test reports:

1. Southwest Research Institute, Final Report No. 01.06440.01.001, dated May, 2003.
2. Underwriters Laboratories, Inc. Final Report 05CA2541, NC2650, dated January 10, 2005
3. Southwest Research Institute, Final Report No. 01.13537.01.106, dated September 26, 2008

The following articles provide excellent background information on the use of foam sheathing in NFPA 285 test assemblies:

[www.rci-online.org/interface/2010-01-hansbro.pdf](http://www.rci-online.org/interface/2010-01-hansbro.pdf)

[bsj.iccsafe.org/august/features/code\\_and\\_fire.html](http://bsj.iccsafe.org/august/features/code_and_fire.html)

Additional proprietary informational pieces can be found here:

[www.dow.com/PublishedLiterature/dh\\_047e/0901b8038047e900.pdf?filepath=styrofoam/pdfs/no\\_reg/179-04502.pdf&fromPage=GetDoc](http://www.dow.com/PublishedLiterature/dh_047e/0901b8038047e900.pdf?filepath=styrofoam/pdfs/no_reg/179-04502.pdf&fromPage=GetDoc)

[building.dow.com/na/en/thermaxtws/consider/fire.htm](http://building.dow.com/na/en/thermaxtws/consider/fire.htm)

### Conclusion:

The ICC family of codes already addresses the risk of fire exposure on various exterior wall systems that have incorporated foam plastic insulation. Proposed changes in continuous insulation requirements in the *IECC* do not change these requirements. The 2009 *IBC* [Section 2603.5](#) requires that wall assemblies in Types I, II, III and IV multi-story buildings and containing foam plastic insulating sheathing be tested in accordance with NFPA 285.

The foam plastics industry has undertaken wall assembly testing to comply with [Section 2603.5](#) of the *IBC*. The current products and assemblies<sup>1</sup> approved for use in these assemblies are found in [Tables 1-3](#) and the links on [Page 3](#).

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<sup>1</sup> Products and assemblies listed reflect those FSC was aware of at the time this *Tech Matters* was published.

## Appendix A:

### 2009 IBC Sections Referenced in this *Tech Matters*

**2603.4.1.4 Exterior walls—one-story buildings.** For one-story buildings, foam plastic having a flame spread index of 25 or less, and a smoke-developed index of not more than 450, shall be permitted without thermal barriers in or on *exterior walls* in a thickness not more than 4 inches (102 mm) where the foam plastic is covered by a thickness of not less than 0.032-inch-thick (0.81 mm) aluminum or corrosion-resistant steel having a base metal thickness of 0.0160 inch (0.41 mm) and the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

**2603.5 Exterior walls of buildings of any height.** *Exterior walls* of buildings of Type I, II, III or IV construction of any height shall comply with Sections 2603.5.1 through 2603.5.7.

*Exterior walls* of cold storage buildings required to be constructed of noncombustible materials, where the building is more than one story in height, shall also comply with the provisions of Sections 2603.5.1 through 2603.5.7. *Exterior walls* of buildings of Type V construction shall comply with Sections 2603.2, 2603.3 and 2603.4.

**2603.5.1 Fire-resistance-rated walls.** Where the wall is required to have a fire-resistance rating, data based on tests conducted in accordance with ASTM E 119 or UL 263 shall be provided to substantiate that the fire-resistance rating is maintained.

**2603.5.2 Thermal barrier.** Any foam plastic insulation shall be separated from the building interior by a thermal barrier meeting the provisions of Section 2603.4, unless special approval is obtained on the basis of Section 2603.9.

**Exception:** One-story buildings complying with Section 2603.4.1.4.

**2603.5.3 Potential heat.** The potential heat of foam plastic insulation in any portion of the wall or panel shall not exceed the potential heat expressed in Btu per square feet (mJ/m<sup>2</sup>) of the foam plastic insulation contained in the wall assembly tested in accordance with Section 2603.5.5. The potential heat of the foam plastic insulation shall be determined by tests conducted in accordance with NFPA259 and the results shall be expressed in Btu per square feet (mJ/m<sup>2</sup>).

**Exception:** One-story buildings complying with Section 2603.4.1.4.

**2603.5.4 Flame spread and smoke-developed indexes.**

Foam plastic insulation, exterior coatings and facings shall be tested separately in the thickness intended for use, but not to exceed 4 inches (102 mm), and shall each have a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL 723.

**Exception:** Prefabricated or factory-manufactured panels having minimum 0.020-inch (0.51 mm) aluminum facings and a total thickness of 1/4 inch (6.4 mm) or less are permitted to be tested as an assembly where the foam plastic core is not exposed in the course of construction.

**2603.5.5 Test standard.** The wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

**Exception:** One-story buildings complying with Section 2603.4.1.4.

**2603.5.6 Label required.** The edge or face of each piece of foam plastic insulation shall bear the *label* of an *approved agency*. The *label* shall contain the manufacturer's or distributor's identification, model number, serial number or definitive information describing the product or materials' performance characteristics and *approved agency's* identification.

**2603.5.7 Ignition.** *Exterior walls* shall not exhibit sustained flaming where tested in accordance with NFPA 268. Where a material is intended to be installed in more than one thickness, tests of the minimum and maximum thickness intended for use shall be performed.

**Exception:** Assemblies protected on the outside with one of the following:

1. A thermal barrier complying with Section 2603.4.
2. A minimum 1 inch (25 mm) thickness of concrete or masonry.
3. Glass-fiber-reinforced concrete panels of a minimum thickness of 3/8 inch (9.5 mm).
4. Metal-faced panels having minimum 0.019-inch-thick (0.48 mm) aluminum or 0.016-inch-thick (0.41 mm) corrosion-resistant steel outer facings.
5. A minimum 7/8 inch (22.2 mm) thickness of stucco complying with Section 2510.