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Code Compliance Research Report CCRR-1031

Issue Date: 01-01-2015
Revised Date: 01-01-2018
Renewal Date: 01-01-2019

DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION
Section: 07 21 00 – Thermal Insulation
Section: 07 25 00 – Water-resistive Barriers/Weather Barriers

REPORT HOLDER:
BASF Corporation
1703 Crosspoint Avenue
Houston, Texas 77054
(888) 900-FOAM
www.spf.basf.com

REPORT SUBJECT:
SPRAYTITE® (SP, 158, 178, 81205, and 81206); and WALLTITE® (US, US-N, and HP+) Spray-applied Polyurethane Foam Insulations

1.0 SCOPE OF EVALUATION

This Research Report addresses compliance with the following Codes:

- 2015, 2012, and 2009 *International Building Code®* (IBC)
- 2015, 2012, and 2009 *International Residential Code®* (IRC)
- 2015, 2012, and 2009 *International Energy Conservation Code®* (IECC)

The insulations described in this report have been evaluated for the following properties:

- Physical properties
- Surface-burning characteristics
- Thermal resistance
- Air permeability
- Vapor permeance
- Alternative to water-resistive barriers
- Alternatives to thermal barriers
- Alternatives to ignition barriers
- Use in fire-resistance-rated construction
- Use in Types I, II, III, and IV construction
- Use in Type V construction

See Table 1 for applicable Code sections related to these properties.

NOTE: This report references 2015 Code sections with [2012] and [2009] Code sections shown in brackets where they differ.

2.0 USES

SPRAYTITE® (SP, 158, 178, 81205, and 81206) and WALLTITE® (US, US-N, and HP+) insulations are nonstructural thermal insulating materials for use on or in interior and exterior walls, floors, and roofs.

Under the IRC, the insulations may be used as air-impermeable insulation as described in Section 3.2.3.

The insulations may be used as a vapor retarder as described in Sections 3.2.4.

The insulations may be used in any Type of construction. When used in exterior walls in Types I, II, III, and IV construction (under the IBC), the wall construction must be in accordance with Section 4.7 and, as applicable, Section 4.6.

When installed as described in Section 4.5, the SPRAYTITE® 81206 and WALLTITE® (US and US-N) may be used as an alternative to the water-resistive barrier required in IBC Section 1404.2 and IRC Section R703.2.

The insulations may be used in fire-resistance-rated construction when construction is as described in Section 4.6.

3.0 DESCRIPTION

3.1 Materials:

3.1.1 Insulation: SPRAYTITE® (SP, 158, 178, 81205, and 81206) and WALLTITE® (US, US-N, and HP+) are two-component, closed-cell, rigid foam plastic insulations. The insulations are produced in the field by professional insulation contractors combining an isocyanate component "A" with a resin component "B", resulting in products having a nominal density of 2.0 pcf. SPRAYTITE® and WALLTITE® insulations use an A component



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designated as ELASTOSPRAY® 8000A. Each insulation uses a proprietary blend for the B component. The B components have a shelf life of six months and the A components have a shelf life of nine months, when stored in factory-sealed containers at temperatures between 50°F and 80°F.

3.1.2 Intumescent Coatings:

3.1.2.1 Aldocoat 800 Intumescent Coating:

Aldocoat 800 intumescent coating, manufactured by Aldo Products Company, is a single-component, water-based latex coating supplied in 5-gallon pails and 55-gallon drums. The materials have a shelf-life of six months when stored in a factory-sealed container at temperatures of 40°F and 90°F.

3.1.2.2 NoBurn® Plus Intumescent Coating:

NoBurn® Plus intumescent coating, manufactured by No-Burn, Inc., is a latex-based coating supplied in 5-gallon pails and 55-gallon drums. The coating has a shelf life of three years when stored in a factory-sealed container at temperatures between 40°F and 90°F.

3.1.2.3 NoBurn Plus XD Intumescent Coating:

NoBurn Plus XD intumescent coating, manufactured by No-Burn, Inc., is a latex-based coating supplied in 5-gallon pails and 55-gallon drums. The coating has a shelf life of three years when stored in a factory-sealed container at temperatures between 40°F and 90°F.

3.1.2.4 TPR² FIRESHELL® (F10E) Coating:

TPR² FIRESHELL® (F10E) intumescent coating is a proprietary, water-based, one-part, nonflammable coating manufactured by TPR² Corporation. The coating is supplied in 5-gallon pails and 55-gallon drums and has a shelf life of twelve months when stored in factory-sealed containers at temperatures between 45°F and 75°F. F10E complies with ICC-ES AC456 as recognized in ICC-ES ESR-3997.

3.1.2.5 TPR² FIRESHELL® (IB-4) Coating:

TPR² FIRESHELL® (IB-4) intumescent coating is a proprietary, water-based, one-part, nonflammable coating manufactured by TPR² Corporation. The coating is supplied in 5-gallon pails and 55-gallon drums and has a shelf life of twelve months when stored in factory-sealed containers at temperatures between 45°F and 75°F.

3.1.2.6 Flame Seal® TB Intumescent Coating:

Flame Seal TB intumescent coating, manufactured by Flame Seal Products, Inc., is a two-component, four-to-one by-volume, liquid-applied, water-based polymeric intumescent coating. The coating is supplied in 6-gallon pails and 55-gallon drums and has a shelf-life of six months when stored in factory-sealed containers at temperatures between 40°F and 90°F. When applied at a minimum thickness of 25 mils wet film over SPRAYTITE® (178 and 81206), and WALLTITE® (US, US-N, and HP+) insulations, the assembly 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. Flame Seal® TB complies with ICC-ES AC456 as recognized in ICC-ES ESR-4002.

3.1.2.7 DC315 Intumescent Coating:

DC315 intumescent coating, manufactured by International Fireproof Technology, Inc., is a water-based coating supplied in 5-gallon pails and 55-gallon drums and has a shelf life of two years when stored in factory-sealed containers at temperatures between 41°F and 95°F. DC315 complies with ICC-ES AC456 as recognized in Intertek CCRR-1076. See Intertek Listing Report "DC 315 Water-based Fireproof Paint".

3.1.2.8 Flame Seal® IB (FS-IB) Intumescent Coating:

Flame Seal TB intumescent coating, manufactured by Flame Seal Products, Inc., is a single component, water-based, liquid-applied intumescent coating. The coating is supplied in 5-gallon pails and 55-gallon drums and has a shelf-life of six months when stored in factory-sealed containers at temperatures between 80°F and 80°F.

3.2 Performance Characteristics:

3.2.1 Surface Burning Characteristics:

The insulations have a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 at a maximum thickness of 4 inches. Based on large-scale tests in accordance with NFPA 286, the insulations can be installed at greater thicknesses as described in Section 4.3 and 4.4. When the insulation is separated from the interior living space of the building with minimum 1/2 inch thick gypsum board, the maximum thickness of the insulations is not limited. Under the 2015 IRC, a thermal barrier of

minimum 23/32 inch thick wood structural panel is also permitted and the thickness is not limited.

3.2.2 Thermal Resistance: The insulations have thermal resistance (*R*-value), at a mean temperature of 75°C, as shown in Table 2.

3.2.3 Air Permeability: SPRAYTITE® (SP, 158, 178, 81205, and 81206) and WALLTITE® (US, US-N, and HP+) insulations, at a minimum thickness of 1 inch, are considered air-impermeable insulation in accordance with 2015 IBC Section 1203.3 [not applicable under the 2012 and 2009 IBC] or IRC Section R806.5 [2009 - R806.4], based on testing in accordance with ASTM E2178 and/or ASTM E283.

3.2.4 Air Barrier: SPRAYTITE® (SP, 158, 178, 81205, and 81206) and WALLTITE® (US, US-N, and HP+) insulations, at a minimum thickness of 1-1/2 inch, are considered air barrier materials in accordance with IECC Section C402.5.1.2.1 [C402.4.1.2.2.1].

3.2.5 Moisture Vapor Permeance: The insulations have a moisture vapor permeance of less than 1 perm and qualify as Class II vapor retarders, based on testing in accordance with ASTM E96, when applied at the following minimum thicknesses:

SPRAYTITE® (SP, 158, and 81205) at 1-1/4 inches

SPRAYTITE® (178 and 81206) at 1-1/2 inches

WALLTITE® (US, US-N and HP+) at 1-1/2 inches

4.0 INSTALLATION

4.1 General:

The insulations 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.

4.2 Application:

The insulations are spray-applied on the jobsite using plural-component metering and processing equipment as recommended in the manufacturer's published installation instructions. All insulations (except Spraytite SP) are applied in passes having a

minimum thickness of 1/2 inch and a maximum thickness of 2 inches per pass, up to the total thickness specified in Sections 3.2, 4.3, and 4.4 of this report. Each insulation pass must be allowed to fully expand, cure, and cool for a minimum of 15 minutes prior to application of a subsequent pass. Spraytite SP may be applied at thicknesses up to 4 inches maximum per pass, with a cooling time of 10 minutes per inch of thickness between each pass. The insulation must not be used in areas that have a maximum continuous service temperature greater than 180°F or in contact with heat-producing appliances. The foam plastic insulations must not be used in electrical outlet or junction boxes. The substrate must be free of moisture, frost or ice, loose scales, rust, oil, and grease, or other surface contaminants.

The insulations must be protected from the weather during and after application, except for applications in accordance with Section 4.5.

4.3 Thermal Barrier:

4.3.1 Application with a Prescriptive Thermal Barrier: The insulations must be separated from the interior of the building by a prescriptive thermal barrier of minimum 1/2 inch gypsum wallboard or an approved equivalent 15 minute thermal barrier complying with, and installed in accordance with, IBC Section 2603.4 or IRC Section R316.4, as applicable. Exceptions are provided in Section 4.3.2 and Section 4.4, or when the installation is in sill plates and headers at a total thickness of 3-1/4 inches or less as permitted by IRC Section R316.5.11.

When the insulations are separated from the interior living space of the building with minimum 1/2 inch thick gypsum board, the maximum thickness of the insulations is not limited.

4.3.2 Application without a Prescriptive Thermal Barrier: The SPRAYTITE® (SP, 158, 178, 81205, and 81206) and WALLTITE® (US, US-N, and HP+) insulations may be installed without the 15-minute thermal barrier prescribed in IBC Section 2603.4 and IRC Section R316.4, in assemblies conforming to one of the assemblies described in Table 3. The insulation and coating may be left exposed as an interior finish as indicated in Table 3.

4.4 Attics and Crawl Spaces:

4.4.1 Application with a Prescriptive Ignition Barrier:

When the insulations are installed within attics or crawl spaces where entry is made only for service of utilities, an ignition barrier must be installed in accordance with IBC Section 2603.4.1.6 or IRC Sections R316.5.3 and R316.5.4, as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable Code, and must be installed in a manner so that the foam plastic insulation is not exposed.

4.4.2 Application without a Prescriptive Ignition Barrier:

The SPRAYTITE® (SP, 158, 178, 81205, and 81206) and WALLTITE® (US, US-N, and HP+) insulations may be installed in attics and crawl spaces as described in this section and Table 4, without the ignition barriers described in IBC Section 2603.4.1.6 and IRC Sections R316.5.3 and R316.5.4, subject to the following conditions:

- Entry to the attic or crawl space is to service utilities, and no storage is permitted.
- There are no interconnected attic or crawl space areas.
- Air in the attic or crawl space is not circulated to other parts of the building.
- Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806, except when air-impermeable insulation is permitted in unvented attics in accordance with IBC Section 1203.3 or IRC Section R806.5 [2009 -R806.4]. Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.4 [1203.3] or IRC Section R408.1, as applicable.
- Combustion air is provided in accordance with International Mechanical Code (IMC) Section 701.

In attics, the insulation may be spray-applied to the underside of roof sheathing or roof rafters, and/or vertical surfaces provided the assembly conforms to one of the assemblies described in Table 4. In crawl spaces, the insulations may be spray-applied to the underside of floors and/or vertical surfaces provided the assembly conforms to one of the assemblies described in Table 4. When an intumescent coating is used, surfaces to be coated must be dry, clean, and free of dirt, loose debris, and any other substances that could interfere with adhesion of the

coating. The intumescent coating must be applied to all surfaces in accordance with the respective coating manufacturer's installation instructions. The coating must be applied when ambient and substrate temperatures are above of 50°F unless otherwise permitted by the intumescent coating manufacturer's installation instructions. The insulations may be installed in unvented attics as described in this section in accordance with IBC Section 1203.3 or IRC Section R806.5 [2009 - R806.4].

4.4.3 Use on Attic Floors: The SPRAYTITE® (SP, 158, 178, 81205, and 81206) and WALLTITE® (US, US-N, and HP+) insulations may be installed in accordance with this section and Table 4 between and over the joists in attic floor. The insulation must be separated from the interior of the building by an approved thermal barrier. The ignition barrier required in IBC Section 2603.4.1.6 and IRC Section R316.5.3 may be omitted.

4.5 Water-Resistive Barrier:

SPRAYTITE® 81206 and WALLTITE® (US and US-N) insulations may be used as an alternative to the water-resistive barrier prescribed in IBC Section 1404.2 and IRC Section R703.2, when installed on exterior walls as described in this section. The insulation must be spray-applied to the exterior side of the sheathing, masonry, or other suitable exterior wall substrates to form a continuous layer of 1 inch minimum thickness. All construction joints and penetrations must be sealed with SPRAYTITE® 81206 or WALLTITE® (US or US-N) insulation. The insulation must be covered with an exterior wall covering within the time specified in the BASF installation instructions.

4.6 Fire-Resistance-Rated Wall Assemblies:

4.6.1 Two-hour Fire-resistance-rated Wall Assembly (Load Bearing): SPRAYTITE® (SP, 158, or 81205) may be installed on interior load-bearing 2 hour fire-resistance-rated walls, when installed in accordance with the following:

4.6.1.1 Wood Framing: Two rows on separate plates, 3 inches apart, of minimum 2 x 4 wood studs (No. 2 Douglas fir) spaced a maximum of 16 inches on center.

4.6.1.2 Wall Finish: Base layer of 5/8 thick Type X gypsum wallboard applied horizontally and fastened to each outer side of a double row of studs with 6d by 1-7/8 inch long coated nails, spaced 24 inches on center. Face layer of 5/8 inch thick Type X gypsum board is applied horizontally and fastened to each outer side of studs over the base layer with 8d by 2-3/8 inch long coated nails, spaced 8 inches on center. Gypsum wallboard joints must be staggered 24 inches between layers and on opposite sides of the wall.

4.6.1.3 Insulation: SPRAYTITE® (SP, 158, or 81205) is applied in the stud cavities of both rows at a thickness of 3 inches.

4.6.2 Other Fire-resistance-rated Assemblies: SPRAYTITE® (SP, 158, 178, 81205, and 81206) and WALLTITE® (US, US-N, and HP+) insulations have been tested for compliance with UL 263 (ASTM E119). Refer to the UL LLC Fire-resistance Directory at www.ul.com.

The UL design listings have not been evaluated under this Research Report.

4.7 Exterior Walls In Types I, II, III, and IV Construction:

SPRAYTITE® 81206 and WALLTITE® (US or US-N) may be installed in or on exterior walls of buildings of Type I, II, III, and IV construction complying with IBC Section 2603.5 and as described in this section. The maximum thickness of the foam plastic is 3 inches when installed on the exterior of the sheathing and 3-5/8 inches when installed in stud cavities. The potential heat of SPRAYTITE® 81206 and WALLTITE® (US or US-N) spray-applied insulations is 1961 Btu/ft² per inch of thickness. The tested wall assemblies were extended through a third-party engineering analysis to include additional wall constructions described in Tables 5 through 8.

5.0 CONDITIONS OF USE

The BASF Corporation spray-applied polyurethane foam insulations described in this Research Report comply with, or are a suitable alternative to, what is specified in those Codes listed in Section 1.0 of this report, subject to the following conditions:

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

5.2 The insulations must be separated from the interior of the building by an approved 15-minute thermal barrier or approved alternate thermal barrier, as described in Section 4.3, except where installation is in an attic or crawl space as described in Section 4.4.

5.3 The insulations must not exceed the maximum thicknesses noted in Section 3.2, 4.3, 4.4, 4.5, 4.6, or 4.7, as applicable.

5.4 The insulations must be applied by professional spray polyurethane foam installers approved by BASF Corporation or approved by the Spray Polyurethane Foam Alliance (SPFA) for the installation of spray polyurethane foam insulation.

5.5 Use of the insulations in areas where the probability of termite infestation is "very high" must be in accordance with IBC Section 2603.8 [2012 - 2603.9] [2009 - 2603.8] or IRC Section R318.4, as applicable.

5.6 Jobsite certification and labeling of the insulation must comply with IRC Section N1101.10 [2012 - N1101.12] [2009 - N1101.4] and IECC Section C303.1 or R303.1 [2009-303.1], as applicable.

5.7 The polyurethane foam plastic insulation components are produced in Houston, Texas, and Orange, California, under a quality control program with inspections by Intertek Testing Services NA, Inc. (AA-647).

6.0 SUPPORTING EVIDENCE

6.1 Reports of tests in accordance with ASTM C518, ASTM E84, ASTM E96, ASTM E119, ASTM E283, ASTM E2178, NFPA 259, NFPA 285, NFPA 286, UL 263, and UL 1715.

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated April 2016, including reports of tests in accordance with Appendix X.

6.3 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Sheathing Panels Used as Water-resistive Barriers (AC71), dated February 2003 (editorially revised January 2016).

6.4 Research Reports for evaluation of data in accordance with ICC-ES Acceptance Criteria for Fire-protective Coatings Applied to Spray-applied Foam Plastic Insulation Installed without a Code-prescribed Thermal Barrier (AC456), dated October 2015.

6.5 Intertek Listing Reports:

["BASF Corporation \(TX\) SPRAYTITE SP Polyurethane Foam"](#)

["BASF Corporation WALLTITE® HP+ Polyurethane Foam"](#)

["BASF Corporation \(TX\) SPRAYTITE 158 Polyurethane Foam"](#)

["BASF Corporation \(TX\) SPRAYTITE 178 Polyurethane Foam"](#)

["BASF Corporation \(TX\) SPRAYTITE 81205 Polyurethane Foam"](#)

["BASF Corporation \(TX\) SPRAYTITE 81206 Polyurethane Foam"](#)

["BASF Corporation \(TX\) WALLTITE US Polyurethane Foam"](#)

["BASF Corporation \(TX\) WALLTITE US-N Polyurethane Foam"](#)

6.6 Hughes Associates, Inc., letters dated April 18, 2011; April 14, 2014; and October 7, 2014, Re. HAI Project 1JJB00019.001; and dated March 23, 2010, Re. HAI Project 1JJB00019000.

7.0 IDENTIFICATION

The A and B components of the insulation are identified with the BASF Corporation name and address, the product name, the product type (A or B component), density, the flame-spread and smoke-developed indices, the shelf life, the manufacturing location, the date of manufacture, the Intertek Mark, and the Code Compliance Research Report number (CCRR-1031). Intumescent coatings are identified with the manufacturer's name, the product trade name, and use instructions.

8.0 OTHER CODES

This section is not applicable.

9.0 CODE COMPLIANCE RESEARCH REPORT USE

9.1 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.

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

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

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TABLE 1 – PROPERTIES EVALUATED

PROPERTY	IBC SECTION ¹	IRC SECTION ¹	IECC SECTION ¹
Physical properties	Not required	Not required	Not required
Surface-burning characteristics	2603.3	R316.3	Not applicable
Alternative to thermal barrier/ignition barrier	2603.4	R316.4	Not applicable
Air permeability	1203.3 [1301]	R806.5 [2009 - R806.4]	C402.4 R402.4
Vapor permeance	202, 1405.3	202, R702.7 [R601.3]	Not applicable
Alternative to water-resistive barrier	1404.2	R703.2	Not applicable
Fire-resistance-rated construction	703	R302	Not applicable
Exterior walls in Types I-IV construction	2603.5	Not applicable	Not applicable
Thermal resistance	1301	N1101.10 N1102 [N1101.1, N1101.12]	C303.1.1 C303.1.4 R303.1.1 R30301.4 [303.1]

¹ Section numbers in parentheses refer to the 2012 and 2009 codes, if different.

TABLE 2 – THERMAL RESISTANCE OF SPRAYTITE® AND WALLTITE® INSULATIONS

SPRAYTITE® (SP, 158, and 81205)	
THICKNESS (INCHES)	R-VALUE¹ (°F.ft².h/Btu)¹
1	6.6
2	13
3	20
3.5	24
4	27
5	34
6	41
7	48
8	54
10	68
11	75
12	82
SPRAYTITE® (178 and 81206); and WALLTITE® (US, US-N, and HP+)	
1	6.7
2	13
3	20
3.5	24
4	28
5	34
6	41
7	48
8	55
10	69
11	76
12	83

¹R-values are calculated based on tested K values at 1-and 4-inch thicknesses. R-values greater than 10 are rounded to the nearest whole number.

TABLE 3 – USE OF INSULATION WITHOUT A PRESCRIPTIVE THERMAL BARRIER

INSULATION TYPE	MAXIMUM THICKNESS (in) (Wall Cavities)	MAXIMUM THICKNESS (in) (Ceilings, Underside of Roof Sheathing / Rafters & Floors)	INTUMESCENT COATING MINIMUM THICKNESS & TYPE (Applied to all Foam Surfaces)	MINIMUM APPLICATION RATE OF THE INTUMESCENT COATING	May be left exposed as an Interior Finish	TESTS SUBMITTED (AC377)
WALLTITE® (US, US-N, HP+) SPRAYTITE® (178, 81206)	5-1/2	11-1/2	4 wet mils DC315 Primer 16 wet mils DC315	1.00 gal / 100 ft ²	Yes	NFPA 286
	8	12	Flame Seal TB 25 wet mils	1.60 gal / 100 ft ²	Yes	UL 1715, and ASTM E84
	5-1/2	7-1/2	Fireshell F10E 23 wet mils	1.23 gal / 100 ft ²	Yes	NFPA 286
SPRAYTITE® (SP, 158, 81205)	11-1/4	11-1/4	Flame Seal TB 24 wet mils	1.60 gal / 100 ft ²	Yes	UL 1715, and ASTM E84
	5-1/2	7-1/2	DC315 20 wet mils	1.25 gal / 100 ft ²	Yes	NFPA 286
	5-1/2	9-1/2	Fireshell F10E 21 wet mils	1.16 gal / 100 ft ²	Yes	NFPA 286

TABLE 4 – USE OF INSULATION IN ATTICS AND CRAWL SPACES WITHOUT A PRESCRIPTIVE IGNITION BARRIER

INSULATION TYPE	MAXIMUM THICKNESS (in) (Wall Cavities & Attic Floors)	MAXIMUM THICKNESS (in) (Underside of Roof Sheathing/Rafters & Floors)	INTUMESCENT COATING MINIMUM THICKNESS & TYPE (Applied to all Foam Surfaces)	MINIMUM APPLICATION RATE OF THE INTUMESCENT COATING	TESTS SUBMITTED (AC377)
WALLTITE® (US, US-N, HP+) SPRAYTITE® (178, 81206)	9-1/4	11-1/4	No coating required	NA	Appendix X
	9-1/4	11-1/4	Fireshell IB-4 10 wet mils	0.60 gal / 100 ft ²	Appendix X
	9-1/4	11-1/4	ALDOCOAT 800 18 wet mils	1.12 gal / 100 ft ²	Appendix X
	9-1/4	11-1/4	NoBurn Plus 12 wet mils	0.75 gal / 100 ft ²	Appendix X
	8	12	Flame Seal TB 25 wet mils	1.60 gal / 100 ft ²	UL 1715
	8	12	DC315 20 wet mils	1.25 gal / 100 ft ²	Appendix X
	5-1/2	11-1/2	DC315 4 wet mils	0.25 gal / 100 ft ²	Appendix X
SPRAYTITE® (SP, 158, 81205)	7-1/4	11-1/4	No coating required	NA	Appendix X
	5-1/2	9-1/2	Fireshell F10E 21 wet mils	1.16 gal / 100ft ²	NFPA 286
	8	8	NoBurn Plus XD 6 wet mils	0.31 gal / 100ft ²	Appendix X
	11-1/4	11-1/4	Flame Seal TB 24 wet mils	1.60 gal / 100ft ²	UL 1715
	11-1/2	11-1/2	Flame Seal FS-IB 8 wet mils	0.50 gal / 100ft ²	Appendix X
	5-1/2	7-1/2	DC315 20 wet mils	1.25 gal / 100ft ²	NFPA 286
	5-1/2	11-1/2	DC315 4 wet mils	0.25 gal / 100 ft ²	Appendix X

NA = not applicable.

TABLE 5 – NFPA 285 COMPLYING WALLS – SPRAYTITE® 81206 OR WALLTITE (US OR US-N) ON EXTERIOR

Wall Component	Materials
Base Wall System – Use either 1, 2, or 3	1 – Concrete wall 2 – Concrete Masonry wall 3 – 1 layer of 5/8 inch thick Type X gypsum wallboard installed on the interior side of minimum 3-5/8 inch deep minimum 20 gauge thick steel studs spaced a maximum of 24 inch on center. Lateral bracing installed minimum every 4 ft. vertically or as required. Wall stud cavities shall be filled at each floor line with minimum 4 lbs/ft ³ mineral wool (e.g. Thermafiber) friction fit between steel wall studs
Perimeter Fire Barrier System	Perimeter fire barrier system complying with Section 715.4 of the 2012 IBC shall be installed, as applicable, to fill the void between the edge of the concrete floor slab and the interior surface of the exterior wall assembly.
Interior Insulation – Use either 1, 2, 3, 4, or 5; or combination of 2 and 4 or combination of 2 and 5.	1 – None 2 – Maximum 6 inch thickness of ENERTITE® NM or ENERTITE® G (CCRR-1032) applied to interior surface of Base Wall System 1 and 2 (See Note 1) 3 – Full wall stud cavity depth or less of ENERTITE® NM or ENERTITE® G applied using exterior gypsum sheathing of Base Wall System 3 as the substrate and covering the width of the cavity and the inside of the steel wall stud framing flange. 4 – Fiberglass batt insulation (faced or unfaced) 5 – Mineral wool insulation (faced or unfaced)
Exterior Sheathing – Use either 1, 2, or 3. If wall stud cavity insulation is ENERTITE NM® SPF (CCRR-1032), then use 3 only	1 – None (for Base Wall Systems 1 or 2 above) 2 – 1/2 inch thick exterior type gypsum sheathing (for Base Wall System 3 above) 3 – 5/8 inch thick Type X exterior type gypsum sheathing (for Base Wall System 3 above)
Exterior Insulation	Maximum 3 inch thickness of SPRAYTITE® 81206 or WALLTITE® (US or US-N)
(Optional) Exterior Insulation Covering – Use 1 or 2	1 – None 2 – As an option, cover SPRAYTITE® 81206 or WALLTITE® (US or US-N) with minimum 2 inch thickness of minimum 4 pcf mineral wool insulation. Mineral wool insulation installation shall be in accordance with Table 8 requirements.
Exterior Wall Covering – Use either 1, 2, 3, 4, or 5	1 – Brick – Standard type brick veneer anchors, installed a maximum 24 inches on center, vertically on each stud with maximum 2 inch air gap between exterior insulation and brick. Brick to be standard nominal 4 inch thick clay brick installed in a running bond pattern using Type S mortar. 2 – Stucco – Minimum 3/4 inch thick, exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes. 3 – Minimum 2 inch thick natural stone (granite, limestone, marble, sandstone). Any standard non-open jointed installation technique can be used. 4 – Minimum 1-1/2 inch thick concrete masonry unit (CMU), pre-cast concrete, or artificial cast stone. Any standard non-open jointed installation technique can be used. 5 – Minimum 1-1/4 inch thick Terra Cotta non-open jointed. Any standard non-open jointed installation technique can be used.
Flashing of window, door and other exterior wall penetrations.	As an option, flash around window, door, and other exterior penetrations with limited amounts of maximum 12 inch wide flashing tape (acrylic, asphalt or butyl-based) or liquid-applied membrane material with or without fiber mesh reinforcement.

Note 1: Fireblocking per Section 718 of the 2012 IBC and thermal barrier material requirements must be met for Base Wall Systems 1 and 2, as required by specific wall construction details when combustible concealed space is created on interior side of exterior wall assembly.

Note 2: Building Code section references may change in different editions of the IBC.

TABLE 6 – NFPA 285 WALLS – SPRAYTITE® 81206 OR WALLTITE® (US OR US-N) ON EXTERIOR WITH EXTERIOR INSULATION COVERING

Wall Component	Materials
Base Wall System – Use either 1, 2, or 3	1 – Concrete wall 2 – Concrete Masonry wall 3 – 1 layer of 5/8 inch thick Type X gypsum wallboard installed on the interior side of minimum 3-5/8 inch deep minimum 20 gauge thick steel studs spaced a maximum of 24 inch on center. Lateral bracing installed minimum every 4 ft. vertically or as required. Wall stud cavities shall be filled at each floor line with minimum 4 lb/ft ³ mineral wool (e.g. Thermafiber) friction fit between steel wall studs
Perimeter Fire Barrier System	Perimeter fire barrier system complying with Section 715.4 of the 2012 IBC shall be installed, as applicable, to fill the void between the edge of the concrete floor slab and the interior surface of the exterior wall assembly.
Interior Insulation – Use either 1, 2, 3, 4, or 5; or combination of 2 and 4 or combination of 2 and 5	1 – None 2 – Maximum 6 inch thickness of ENERTITE® NM or ENERTITE® G (CCRR-1032) applied to interior surface of Base Wall System 1 and 2 (See Note 1) 3 – Full wall stud cavity depth or less of ENERTITE® NM or ENERTITE® G applied using exterior gypsum sheathing of Base Wall System 3 as the substrate and covering the width of the cavity and the inside of the steel wall stud framing flange. 4 – Fiberglass batt insulation (faced or unfaced) 5 – Mineral wool insulation (faced or unfaced)
Exterior Sheathing – Use either 1, 2, or 3. If wall stud cavity insulation is ENERTITE NM® SPF (CCRR-1032), then use 3 only	1 – None (for Base wall systems 1 or 2 above) 2 – 1/2 inch thick exterior type gypsum sheathing (for Base Wall System 3 above) 3 – 5/8 inch thick Type X exterior type gypsum sheathing (for Base Wall System 3 above)
Exterior Insulation	Maximum 3-1/2 inch thickness of SPRAYTITE® 81206 or WALLTITE® (US or US-N)
Exterior Insulation Covering	Cover SPRAYTITE® 81206 or WALLTITE® (US or US-N) with minimum 2 inch thickness of minimum 4 pcf mineral wool insulation. Mineral wool insulation installation shall be in accordance with Table 8 requirements.
Exterior Wall Covering – Use either 1, 2, or 3 (See Note 3)	1 – Any non-combustible exterior wall covering material using any standard installation technique 2 – Any non-combustible exterior wall covering system with a combustible WRB that has successfully been tested in accordance with NFPA 285. 3 – Any combustible exterior wall covering system with or without a combustible WRB that has successfully been tested in accordance with NFPA 285
Flashing of window, door and other exterior wall penetrations.	As an option, flash around window, door, and other exterior penetrations with limited amounts of maximum 12 inch wide flashing tape (acrylic, asphalt or butyl-based) or liquid applied membrane material with or without fiber mesh reinforcement.

Note 1: Fireblocking per Section 718 of the 2012 IBC and thermal barrier material requirements must be met for Base Wall Systems 1 and 2, as required by specific wall construction details when combustible concealed space is created on interior side of exterior wall assembly.

Note 2: Building Code section references may change in different editions of the IBC.

Note 3: Combustible exterior wall coverings shall be installed in accordance with manufacturer’s installation requirements.

TABLE 7 – NFPA 285 COMPLYING WALLS – SPRAYTITE® 81206 OR WALLTITE® (US OR US-N) IN INTERIOR WALL CAVITY

Wall Component	Materials
Base Wall System – Use either 1, 2, or 3	1 – Concrete wall 2 – Concrete Masonry wall 3 – 1 layer of 5/8 inch thick Type X gypsum wallboard installed on the interior side of minimum 3-5/8 inch deep minimum 20 gauge thick steel studs spaced a maximum of 24 inch on center. Lateral bracing installed minimum every 4 feet vertically or as required. Wall stud cavities shall be filled at each floor line with minimum 4 lb/ft ³ mineral wool (e.g. Thermafiber) friction fit between steel wall studs.
Perimeter Fire Barrier System	Perimeter fire barrier system complying with Section 715.4 of the 2012 IBC shall be installed, as applicable, to fill the linear gap between the edge of the concrete floor slab and the interior surface of the exterior wall assembly.
Interior Insulation – Use either 1, 2, 3, 4 or 5 or combinations of 3 with 4 or 3 with 5	1 – None 2 – Maximum 3-5/8 inch thickness of SPRAYTITE® 81206 or WALLTITE® (US or US-N) applied to interior surface of Base Wall System 1 and 2 (See Note 1) 3 – Full wall stud cavity depth or less of SPRAYTITE® 81206 or WALLTITE® (US or US-N) applied using exterior gypsum sheathing of Base Wall System 3 as the substrate and covering the width of the cavity and the inside of the steel wall stud framing flange. 4 – Fiberglass batt insulation (faced or unfaced) 5 – Mineral wool insulation (faced or unfaced)
Exterior Sheathing	5/8 inch thick Type X exterior type gypsum sheathing (for Base Wall System 3 above)
Exterior Wall Covering	Any non-combustible exterior wall covering material using any standard installation technique
Flashing of window, door and other exterior wall penetrations.	As an option, flash around window, door, and other exterior penetrations with limited amounts of maximum 12 inch wide flashing tape (acrylic, asphalt or butyl-based) or liquid applied membrane material with or without fiber mesh reinforcement.

Note 1: Fireblocking per Section 718 of the 2012 IBC and thermal barrier material requirements must be met for Base Wall Systems 1 and 2, as required by specific wall construction details when combustible concealed space is created on interior side of exterior wall assembly.

Note 2: Building Code section references may change in different editions of the IBC.

TABLE 8 – MINERAL WOOL INSULATION INSTALLATION REQUIREMENTS FOR TABLES 5 AND 6

Wall Component	Requirements
Mineral Wool Insulation Installation Requirements	<ol style="list-style-type: none"> 1 – Mineral wool insulation shall be mechanically fastened to the wall surface using perforated base insulation pins. 2 – Each insulation pin shall be screwed into exterior sheathing and/or steel wall studs. 3 – The length of the insulation pin shall be sized to accommodate the thickness of the SPF plus the mineral wool insulation thickness plus a minimum of 1 inch. 4 – Insulation pin spacing shall be such that a pin is located in each corner of each mineral wool batt as well as one pin located in the geometric center of each insulation batt. 5 – All pins shall be located nominally 2 inches in from the edge of the insulation batt. 6 – SPF shall be installed onto the exterior wall surface such that the perforated pin bases are fully encapsulated. 7 – Mineral wool insulation shall be impaled onto the insulation pins and secured using nominal 2-1/2 inch square galvanized speed friction washers. 8 – Insulation pin tips protruding beyond the speed friction washer shall be bent over to prevent the washer from falling off. 9 – Mineral wool batts shall be tightly fitted against adjacent batts and joints shall be staggered a minimum of one-half batt insulation width (minimum 12 inches).
Mineral Wool Specifications	<ol style="list-style-type: none"> 1 – Mineral wool insulation shall meet the requirements of ASTM C612. 2 – Mineral wool insulation shall not have any type of facer (foil, etc.) on either side. 3 – Mineral wool insulation shall be noncombustible when tested in accordance with ASTM E136. 4 – The mineral wool insulation density shall be a minimum of 4.0 lbs/ft³. 5 – The R-value per inch for the mineral wool insulation shall be a minimum of 3.45 6 – Mineral wool insulation shall be installed as described above.