



MIKE CAUSEY, INSURANCE COMMISSIONER & STATE FIRE MARSHAL
BRIAN TAYLOR, CHIEF STATE FIRE MARSHAL

March 5, 2023

Mr. Donald J. Haurert III
BHDP Architecture
150 Fayetteville Street, Suite 820
Raleigh, NC 27601

RE: BHDP / SECU: 2018 NCBC Section 2603.3 Surface burning characteristics

Mr. Haurert:

This letter is in response to your request for formal interpretation to the Office of State Fire Marshal ("OSFM") dated January 23, 2023, which NCDOI received by email on 1/26/23. I am addressing your requests below in the order in which they are posed.

Your letter states in relevant part:

"The project was specified and approved for a permit using spray foam insulation. The insulation was applied in the project using BASF Spraytite 178 series for areas above the exterior windows in the ceiling plenum. The inspector noted that the material was not an approved use.

According to the 2018 North Carolina, Building Code section 2603.3 Foam plastic insulation must have a flame spread rating of less than 75 and a smoke-developed index of less than 450 when tested in accordance with ASTM E84 or UL 723.

The Manufacturer's test data notes it meets the above-listed surface burning characteristics but requires a thermal barrier. This thermal barrier was not installed by the Contractor, and we are proposing adding an intumescent coating to comply with the manufacturer's test data.

Several products are suggested by the manufacturer, one of which is IFTI DC315 Intumescent Coating at a minimum thickness of 20 mil wet to meet NFPA286.

It is our request that this coating is added to meet and comply with the 2018 NCBC Section 2603.3 requirements. This alternate meets or exceeds the intent and provision of this section.

All referenced communication with Local AHJ and Manufacturer's data is attached."

Code Analysis: Foam plastic insulation used as interior finish or interior trim in plenums on exterior walls must be completely covered by a non-combustible material or the exposed foam plastic material must meet more stringent flame spread and smoke spread indexes and testing requirements.

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 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.

....

2603.5.2 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.

....

2603.5.7 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.
6. A minimum 1/4-inch (6.4 mm) thickness of fiber-cement lap, panel or shingle siding complying with Sections 1405.16 and 1405.16.1 or 1405.16.2.

....

2603.7 Foam Plastic Insulation Used as Interior Finish or Interior Trim in Plenums. Foam plastic insulation used as interior wall or ceiling finish or as interior trim in plenums shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723 and shall comply with one or more of Sections 2603.7.1, 2603.7.2 and 2603.7.3.

2603.7.1 Separation Required. The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723 at the thickness and density intended for use.

2603.7.2 Approval. The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E84 or UL 723

at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 when tested in accordance with NFPA 286. The foam plastic insulation shall be approved based on tests conducted in accordance with Section 2603.9.

2603.7.3 Covering. The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723 at the thickness and density intended for use.

....

2603.4 Thermal Barrier. Except as provided for in Sections 2603.4.1 and 2603.9, foam plastic shall be separated from the interior of a building by an approved thermal barrier of 1/2-inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. Combustible concealed spaces shall comply with Section 718.

....

2603.9 Special Approval. Foam plastic shall not be required to comply with the requirements of Section 2603.4 or those of Section 2603.6 where specifically approved based on large-scale tests such as, but not limited to, NFPA 286 (with the acceptance criteria of Section 803.1.2.1), FM 4880, UL 1040 or UL 1715. Such testing shall be related to the actual end-use configuration and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as interior finish on the basis of special tests shall also conform to the flame spread and smoke-developed requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

....

The intumescent coating product information references ICC-ESR 3702 for code compliance for the USA market. <https://painttoprotect.com/wp-content/uploads/2019/06/ESR-3702-1.pdf>

....

Conclusions:

Since the spray foam insulation has a flame spread index of 25 and a smoke-spread index of 450 and is installed on an exterior wall in a plenum, the thermal barrier requirements of 2018 NCBC Section 2603.7.1, 2603.4, 2603.5.2 and 2603.9 are applicable. The intumescent coating product information does not indicate that it has been tested to meet the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275 as noted in 2018 NCBC 2603.7.1 and by reference in 2603.4 for installation as a thermal barrier in a plenum. The intumescent coating product does meet the ignition barrier requirements of 2018 NCBC 2603.5.7 as it complies with NFPA 286 for use on an exterior wall. The product information and ICC-ESR 3702 do not mention approval of this intumescent coating product for use as the thermal barrier and ignition barrier for the application of

spray foam insulation in a plenum. Therefore, until more information is provided that supports the use of this intumescent coating product in a plenum, this application does not meet the intent of the code.

Sincerely,

A handwritten signature in black ink that reads "DR. Rittlinger". The signature is written in a cursive style with a large, stylized "DR" at the beginning.

David B. Rittlinger, PE, LEED AP
Chief Code Consultant
NCDOT-OSFM Engineering & Codes Division

cc: Bridget Herring, Chair – BCC
 Mark Matheny, Vice-Chair – BCC
 Michael Ali, Chair, Commercial Super Committee - BCC
 Nathan Childs, Esq., NCDOT, counsel for NC Building Code Council, nchilds@ncdot.gov

ATTACHMENT A

RE: Request for Formal Interpretation - SECU Greensboro Spray Foam Barrier

Rittlinger, David B
To: Donald J. Haunert
Cc: APPELQUIST, JAMIE; Yip, Pak; Martin, Carl

Reply Reply All Forward

Fri 1/27/2023 6:59 AM

Mr. Haunert,
Good morning,
I hope you are well.
I am receipt of your request for formal interpretation.
Our office will provide a formal interpretation letter to you as soon as possible.
Thank you.

David B. Rittlinger, PE, LEED AP
Code Interpretations Supervisor
Chief Code Consultant
Chief Mechanical & Fuel Gas Code Consultant
Engineering Division



Link to free view of 2018 NC Codes
<https://codes.ncsafe.org/codes/north-carolina>

RE: Request for Formal Interpretation - SECU Greensboro Spray Foam Barrier

Martin, Carl
To: Rittlinger, David B
Cc: Donald J. Haunert; APPELQUIST, JAMIE; Yip, Pak

Reply Reply All Forward

Thu 1/26/2023 6:50 PM

- You replied to this message on 1/27/2023 6:58 AM.
- BCC: Appeals-and-Formal-Interpretations.pdf 1/26/23
- 2022-12-07 Informal Interpretation - SECU Greensboro Spray Foam Insulation.pdf 1/23/23
- RE: SECU Greensboro Spray Foam Barrier Outlook Item
- RE: SECU Greensboro Spray Foam Barrier Outlook Item
- FW: SECU Greensboro Spray Foam Insulation Outlook Item
- FW: SECU Greensboro Spray Foam Insulation Outlook Item

David,
The attached request is for a formal interpretation. As you are the Chief Code Consultant for DOI, I am forwarding this to you for response. Thank you.

Carl Martin, RA
Deputy Commissioner
Division Chief of Engineering



"Consistency" as defined by Merriam-Webster – "harmony of conduct or practice with profession"

From: Donald J. Haunert <DHaunert@bhdg.com>
Sent: Thursday, January 26, 2023 2:53 PM
To: Yip, Pak <pak.yip@ncdoi.gov>
Cc: Martin, Carl <Carl.Martin@ncdoi.gov>; APPELQUIST, JAMIE <jamie.Applequist@ncsecu.org>
Subject: [External] Request for Formal Interpretation - SECU Greensboro Spray Foam Barrier

CAUTION: External email. Do not click links or open attachments unless you verify. Send all suspicious email as an attachment to Report.Spam.

Carl,
Per our call, please see attached request for a formal interpretation. I have also included all supporting information and conversations with the Greensboro AHJ.
Please let me know if you need anything further.

Thanks
Don

Donald J. Haunert, AIA, LEED AP
Client Leader
D 919.747.5427
M 919.995.6027

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All referenced communication with the City of Greensboro and manufacturer's product information is attached below.

Donald J. Haunert

From: Yip, Pak <pak.yip@ncdoi.gov>
Sent: Wednesday, December 7, 2022 10:39 AM
To: Isaac, Cliff
Cc: Donald J. Haunert; Martin, Carl; APPLEQUIST, JAMIE
Subject: RE: [External] Informal interpretation - SECU Greensboro Spray Foam Barrier

Follow Up Flag: Flag for follow up
Flag Status: Completed

You don't often get email from pak.yip@ncdoi.gov. [Learn why this is important](#)

Cliff,

Hope you are doing well!

Section 2603.7 specified the smoke and flame characteristics requirement for foam plastic insulation used in a plenum space. Section 2603.7.1 required all form plastic to be separated from the interior of the building by a thermal barrier such as ½" gypsum board or other approved equivalent material. The use of intumescent paint shall be considered as an alternate method and an evaluation report shall be submitted to proof the coating or paint is tested as an alternate material for replacing the thermal barrier in the plenum space.

I hope the information above is helpful to you. Please let me know if you have any questions.

Pak Keung Yip, P.E.
Chief Building Code Consultant



N.C. Department of Insurance
Office of State Fire Marshal
1202 Mail Service Center
Raleigh, NC 27699-1202
919.647.0007

From: Isaac, Cliff <cisaac@withersravenel.com>
Sent: Monday, December 5, 2022 10:09 PM
To: Yip, Pak <pak.yip@ncdoi.gov>
Cc: Donald J. Haunert <DHaunert@bhdp.com>; Martin, Carl <Carl.Martin@ncdoi.gov>; APPLEQUIST, JAMIE <Jamie.Applequist@ncsecu.org>
Subject: Re: [External] Informal interpretation - SECU Greensboro Spray Foam Barrier

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Pak,

Thanks. Just to follow up, can an intumescent coating that meets the code requirements be used in a plenum inside a commercial building instead of 1/2" Sheetrock? Carl may have encountered this question before.

Thanks,
Cliff

Sent from my iPhone

On Dec 5, 2022, at 4:34 PM, Yip, Pak <pak.yip@ncdoi.gov> wrote:

Donald,

Is the plenum you mentioned a true plenum that meets the definition from the NC Mechanical Code?

PLENUM. An enclosed portion of the building structure, other than an *occupiable space* being conditioned, that is designed to allow air movement, and thereby serve as part of an air distribution system.

If it is a plenum that meets the code definition, then it is my opinion that NCBC section 2603.7 shall apply when form plastic is used in a plenum place.

I hope the information above is helpful to you. Please let me know if you have any questions.

Pak Keung Yip, P.E.
Chief Building Code Consultant
<image008.png>

<image009.jpg>

N.C. Department of Insurance
Office of State Fire Marshal
1202 Mail Service Center
Raleigh, NC 27699-1202
919.647.0007

From: Donald J. Haurert <DHaurert@bhdpc.com>
Sent: Monday, December 5, 2022 2:32 PM
To: Martin, Carl <Carl.Martin@ncdoi.gov>; Yip, Pak <pak.yip@ncdoi.gov>
Cc: Isaac, Cliff <cisaac@withersravenel.com>; APPLEQUIST, JAMIE <jamie.applequist@ncsecu.org>
Subject: [External] Informal interpretation - SECU Greensboro Spray Foam Barrier
Importance: High

CAUTION: External email. Do not click links or open attachments unless you verify. Send all suspicious email as an attachment to [Report Spam](#).

Carl,
I hope this email finds you well. Cliff Issac provided your contact information to get an informal interpretation request of a spray foam installation for NCSECU in Greensboro.

I have attached the correspondence and letter of our interpretation.

Please let us know if you have questions or would like a conversation.

We appreciate your time in helping us with this subject.

Sincerely,
Don

Donald J. Haunert, AIA, LEED AP

Client Leader
D 919.747.5427
M 919.995.6027

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From: Donald J. Haunert <DHaunert@bhdp.com>

Sent: Monday, November 28, 2022 4:21 PM

To: cisaac@withersravenel.com

Cc: Josh Seymour (JSeymour@mcdonaldyork.com) <jseymour@mcdonaldyork.com>; APPLEQUIST, JAMIE <jamie.applequist@ncsecu.org>

Subject: Fw: [EXTERNAL] FW: SECU Greensboro Spray Foam Barrier

Cliff,

Thanks for taking my call today. Please see attached correspondence regarding the issue we spoke about.

I apologize for its length but let us know if you have time on Wed or Thursday to review with Josh and me.

Thanks
Don

Donald J. Haunert III, LEED AP
BHDP Architecture | Client Services Manager
m: 919.995.6027 | www.BHDP.com

Donald J. Haunert, AIA, LEED AP

Client Leader
D 919.747.5427
M 919.995.6027

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From: Josh Seymour <JSeymour@mcdonaldyork.com>

Sent: Monday, November 28, 2022 12:21 PM

To: Donald J. Haurert <DHaurert@bhdp.com>
Subject: [EXTERNAL] FW: SECU Greensboro Spray Foam Barrier

From: Josh Seymour
Sent: Tuesday, November 22, 2022 2:11 PM
To: APPLEQUIST, JAMIE <Jamie.Applequist@ncsecu.org>
Cc: CRANE, JONATHAN <Jonathan.Crane@ncsecu.org>
Subject: FW: SECU Greensboro Spray Foam Barrier

Jamie,
See below email correspondence and attachments as discussed over the phone earlier today. Also below is a breakdown of how we got here:

- No comments provided during plan review for a barrier to be over the spray foam insulation
- No comments provided during the initial inspection of the spray foam (see attached). Sherri York with Greensboro approved on 12/7/21
- Overhead inspections were done on floors 2-4 before this was brought up. During the overhead inspection on the 1st FL was when it was pointed out that we needed a barrier over the spray foam
- Greensboro seemed that they would work with us and were told we needed to provide Alternative to the Code for the intumescent coating, as you can see this was provided and it took them a while to review/respond
- We then provided a separate letter explaining our stance, the answer still came back as “No”
- After this we discussed with Don from BHDP our next steps and below were the options provided to us:
 - ½” drywall
 - Corrosive resistant steel .4 mils thick
 - Fire rated lumber
 - 1-1/2” mineral wool insulation
 - Of these options we felt that 1-1/2” mineral wool would be our best option to proceed, Greensboro again said no and drywall was our only option from a material cost standpoint
 - Hence the recent pricing that was provided

I hope this is enough information and let me know if you need any additional information or have any additional questions.

From: Sheffield, Don [<mailto:Donald.Sheffield@greensboro-nc.gov>]
Sent: Monday, November 7, 2022 2:38 PM
To: Josh Seymour <JSeymour@mcdonaldyork.com>; Register, Julius <Julius.Register@greensboro-nc.gov>
Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>; Jesse <Jesse@evergreenfoam.com>; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Lovings, Randy <Randy.Lovings@greensboro-nc.gov>
Subject: RE: SECU Greensboro Spray Foam Barrier

After reading section 2603.4 and 2603.4.1.6, Mineral wool insulation can only be used in attics and crawls, not the plenum. ½” gypsum is required

Thanks

Don Sheffield

Chief Building Inspector, City of Greensboro
336-373-3685

<image001.jpg>

From: Josh Seymour <JSeymour@mcdonaldyork.com>
Sent: Monday, November 7, 2022 1:27 PM
To: Sheffield, Don <Donald.Sheffield@greensboro-nc.gov>; Register, Julius <Julius.Register@greensboro-nc.gov>
Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Lovings, Randy <Randy.Lovings@greensboro-nc.gov>
Subject: RE: SECU Greensboro Spray Foam Barrier

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Strapping

From: Sheffield, Don [<mailto:Donald.Sheffield@greensboro-nc.gov>]
Sent: Monday, November 7, 2022 1:25 PM
To: Josh Seymour <JSeymour@mcdonaldyork.com>; Register, Julius <Julius.Register@greensboro-nc.gov>
Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Lovings, Randy <Randy.Lovings@greensboro-nc.gov>
Subject: RE: SECU Greensboro Spray Foam Barrier

How would you fasten it?

Don Sheffield

Chief Building Inspector, City of Greensboro
336-373-3685

<image001.jpg>

From: Josh Seymour <JSeymour@mcdonaldyork.com>
Sent: Monday, November 7, 2022 1:22 PM
To: Sheffield, Don <Donald.Sheffield@greensboro-nc.gov>; Register, Julius <Julius.Register@greensboro-nc.gov>
Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Lovings, Randy

<Randy.Lovings@greensboro-nc.gov>

Subject: RE: SECU Greensboro Spray Foam Barrier

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Don/Julius,

Per the section below, we would like to install 1-1/2" mineral wool over the spray foam insulation:

Will this be acceptable?

<image002.png>

From: Sheffield, Don [<mailto:Donald.Sheffield@greensboro-nc.gov>]

Sent: Wednesday, November 2, 2022 1:52 PM

To: Josh Seymour <JSeymour@mcdonaldyork.com>; Register, Julius <Julius.Register@greensboro-nc.gov>

Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Donald J. Hاونert <DHاونert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Lovings, Randy <Randy.Lovings@greensboro-nc.gov>

Subject: RE: SECU Greensboro Spray Foam Barrier

Any alternative to the code must be sent to Julius Register. We will review it together.

Thanks

Don Sheffield

Chief Building Inspector, City of Greensboro
336-373-3685

<image001.jpg>

From: Josh Seymour <JSeymour@mcdonaldyork.com>

Sent: Wednesday, November 2, 2022 1:47 PM

To: Sheffield, Don <Donald.Sheffield@greensboro-nc.gov>; Register, Julius <Julius.Register@greensboro-nc.gov>

Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Donald J. Hاونert <DHاونert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Lovings, Randy <Randy.Lovings@greensboro-nc.gov>

Subject: RE: SECU Greensboro Spray Foam Barrier

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Don,

Thanks for your quick review. When you have a moment we would like to discuss another option. Let me some times your available so we can discuss.

Thanks again and let me know if you have any additional questions.

From: Sheffield, Don [<mailto:Donald.Sheffield@greensboro-nc.gov>]
Sent: Tuesday, November 1, 2022 1:33 PM
To: Josh Seymour <JSeymour@mcdonaldyork.com>; Register, Julius <Julius.Register@greensboro-nc.gov>
Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Lovings, Randy <Randy.Lovings@greensboro-nc.gov>
Subject: RE: SECU Greensboro Spray Foam Barrier

We are still going to say no.
Thanks

Don Sheffield

Chief Building Inspector, City of Greensboro
336-373-3685

<image001.jpg>

From: Josh Seymour <JSeymour@mcdonaldyork.com>
Sent: Tuesday, November 1, 2022 10:04 AM
To: Register, Julius <Julius.Register@greensboro-nc.gov>; Sheffield, Don <Donald.Sheffield@greensboro-nc.gov>
Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Lovings, Randy <Randy.Lovings@greensboro-nc.gov>
Subject: RE: SECU Greensboro Spray Foam Barrier

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Julius/Don,
See attached response for the alternative thermal barrier. We would like to get this resolved and we feel the best way to resolve this would be to have a call to discuss. If you could please send me times that you're available and we can schedule a conference call.

Thanks for your quick attention to this matter and let me know should you have any additional questions.

From: Register, Julius [<mailto:Julius.Register@greensboro-nc.gov>]
Sent: Monday, October 17, 2022 9:19 AM
To: Josh Seymour <JSeymour@mcdonaldyork.com>
Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Sheffield, Don <Donald.Sheffield@greensboro-nc.gov>; Lovings, Randy <Randy.Lovings@greensboro-nc.gov>; Hyatt, John <John.Hyatt@greensboro-nc.gov>
Subject: RE: SECU Greensboro Spray Foam Barrier

Josh,

Don Sheffield and I discussed this. Don has advised me the location is in a plenum above the ceiling. The ESR-2642, Section 4.4.2, item c. states that "Air in the attic or crawl space is not circulated to other parts of the building". This material can't be used in a plenum. The required standard, NFPA 275, is not listed as a characteristic of the material anyway.

I suggest you discuss other options for complying with NCBC 2603.4 with the field inspector.

Thanks!

Julius Register

Plan Review Supervisor

Inspections Department

City of Greensboro

P.O. Box 3136, Greensboro, NC 27402-3136

Office: (336)373-2844; Cell: (336)451-1087; FAX: (336)333-6056

email: julius.register@greensboro-nc.gov

City Website:

<https://link.edgepilot.com/s/4b88f982/DJkqf6xbN0WrsD1chRZ1rw?u=http://www.greensboro-nc.gov/>

Please take the time to take our customer service survey. Your feedback is appreciated. Thank you!

<image003.gif>

From: Josh Seymour <JSeymour@mcdonaldyork.com>

Sent: Monday, October 10, 2022 3:10 PM

To: Register, Julius <Julius.Register@greensboro-nc.gov>

Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>;

Donald J. Haurert <DHaurert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph

<Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Sheffield, Don

<Donald.Sheffield@greensboro-nc.gov>; Lovings, Randy <Randy.Lovings@greensboro-nc.gov>

Subject: RE: SECU Greensboro Spray Foam Barrier

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Julius,

See attached as requested below

From: Register, Julius [<mailto:Julius.Register@greensboro-nc.gov>]

Sent: Friday, September 23, 2022 1:21 PM

To: Sheffield, Don <Donald.Sheffield@greensboro-nc.gov>; Josh Seymour

<JSeymour@mcdonaldyork.com>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>

Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>;

Paul Munds <PMunds@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>;

Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>

Subject: RE: SECU Greensboro Spray Foam Barrier

To all,

See attached procedure for proposal of alternate materials, designs or methods. The documentation will need to show how the proposed barrier complies with the requirements of NCBC 2603.4 and

referenced standards. Normally, we review these during the plan review process. Since the plan review is already completed, we'll take the documentation in the form of a .pdf attachment sent by email.

Thanks!

Julius Register

Plan Review Supervisor

Inspections Department

City of Greensboro

P.O. Box 3136, Greensboro, NC 27402-3136

Office: (336)373-2844; Cell: (336)451-1087; FAX: (336)333-6056

email: julius.register@greensboro-nc.gov

City Website:

<https://link.edgepilot.com/s/5604019d/Dah1RqbsOE63AxQqTalGxw?u=http://www.greensboro-nc.gov/>

Please take the time to take our customer service survey. Your feedback is appreciated. Thank you!

<image003.gif>

From: Sheffield, Don <Donald.Sheffield@greensboro-nc.gov>

Sent: Friday, September 23, 2022 12:53 PM

To: Josh Seymour <JSeymour@mcdonaldyork.com>; Register, Julius <Julius.Register@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>

Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>;

Paul Munds <PMunds@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>;

Jesse@evergreenfoam.com

Subject: RE: SECU Greensboro Spray Foam Barrier

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Thanks

Don Sheffield

Chief Building Inspector, City of Greensboro

336-373-3685

<image001.jpg>

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To: Sheffield, Don <Donald.Sheffield@greensboro-nc.gov>

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Paul Munds <PMunds@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>;

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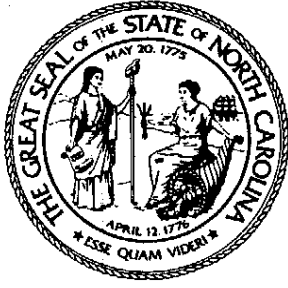
Thanks and let me know should you have any additional questions.

Josh Seymour
Project Manager

McDonald York Building Company
801 Oberlin Rd, Suite 235 | Raleigh, NC 27605
t:(919) 832-3770 d:(919) 277-1383 c:(919) 268-9046

<image004.jpg>

[Join Our Team](#)



**APPENDIX E
 APPEALS
 NORTH CAROLINA
 BUILDING CODE COUNCIL
 325 North Salisbury Street, Room 5_44
 Raleigh, North Carolina 27603
 (919) 647-0095**

APPEAL TO NCDOI/NCBCC

Hearing Date ____ / ____ / ____

GS 153A-374, GS 160A-434
 Formal Interpretation by NCDOI _____
 Appeal of Local Decision to NCDOI _____

GS 143-140, GS 143-141
 Appeal of Local Decision to NCBCC _____
 Appeal of NCDOI Decision to NCBCC _____

APPELLANT Donald J. Haurert III **PHONE** (919) 747 - 5427 **x** _____
REPRESENTING BHDP Architecture / NC State Employees Credit Union
ADDRESS 150 Fayetteville Street, Suite 820
CITY Raleigh **STATE** NC **ZIP** 27601
E-MAIL dhaunert@bhdp.com **FAX** (513) 271 - 7017

North Carolina State Building Code, Volume 2018 NCBC - Section 2603

REQUEST ONE: Formal Interpretation by NCDOI Appeal of Local Decision to NCBCC
 Appeal of Local Decision to NCDOI Appeal of NCDOI Decision to NCBCC

Type or print. Include all background information as required by the referenced General Statutes and the attached policies. Attach additional supporting information.

The project was specified and approved for a permit using spray foam insulation. The insulation was applied in the project using BASF Spraytite 178 series for areas above the exterior windows in the ceiling plenum. The inspector noted that the material was not an approved use.

According to the 2018 North Carolina, Building Code section 2603.3 Foam plastic insulation must have a flame spread rating of less than 75 and a smoke-developed index of less than 450 when tested in accordance with ASTM E84 or UL 723.

The Manufacturer's test data notes it meets the above-listed surface burning characteristics but requires a thermal barrier. This thermal barrier was not installed by the Contractor, and we are proposing adding an intumescent coating to comply with the manufacturer's test data.

REASON:
 Several products are suggested by the manufacturer, one of which is IFTI DC315 Intumescent Coating at a minimum thickness of 20 mil wet to meet NFPA286.

It is our request that this coating is added to meet and comply with the 2018 NCBC Section 2603.3 requirements. This alternate meets or exceeds the intent and provision of this section.

All referenced communication with Local AHJ and Manufacturer's data is attached.

Signature 

DATE: 01/23/2023

APPEAL TO NCDOI/NCBCC
FORM 3/14/17

202.9 Appeals

202.9.1 Engineering Division. A written technical interpretation shall be provided as specified in Section 203.2.1.2. Any person may appeal in writing an order, decision, or determination pertaining to the code or any state building law by filing written notice with the Commissioner of Insurance or his designee within ten (10) days after the order, decision, or determination. A copy of the appeal shall be furnished to each party.

(General Statutes 143-140, 153A-374 and 160A-434)

203.2.1 Interpretations

203.2.1.1 Informal Interpretations. The Engineering Division shall provide informal interpretations on code related matters either by e-mail, letter or telephone. These informal interpretations may be accepted by the local code enforcement official or party requesting the interpretation. Either party may request a formal interpretation of the code.

203.2.1.2 Formal Interpretations. Any person may request in writing a formal interpretation of the code. The request shall be addressed to the Chief Code Consultant for the Department of Insurance. The request shall be specific and shall reference the code sections in question. All formal interpretations shall be in writing. A formal interpretation shall be binding on all parties unless appealed to the Building Code Council as specified in Section 201.9.2. Formal interpretations determined to be of a general nature may be posted on the Department website. (General Statute 143-140)

203.2.2 Appeals. Any person may appeal in writing an order, decision, or determination of a code enforcement official pertaining to the code or any state building law. The appeal shall be addressed to the Chief Engineer for the Department of Insurance by filing written notice within ten (10) days after the order, decision, or determination. The appeal shall contain the type and size of the building in question, the location of the building, and shall reference the code sections in question. The decision shall be in writing and shall set forth the facts found. The decision rendered shall be based on the technical provisions of the code, public health and safety and shall be construed liberally to those ends. A decision shall be binding on all parties unless appealed to the Building Code Council as specified in Section 201.9.2. A copy of the appeal and written decision shall be furnished to each party. (General Statutes 153A-374 and 160A-434)

202.9.2 Building Code Council. The Building Code Council shall hear appeals from the decisions of State enforcement agencies relating to any matter related to the code. Any person wishing to appeal a decision of a State enforcement agency to the Building Code Council shall give written notice of appeal as follows:

202.9.2.1 Twenty one (21) copies including an original of the Notice of Appeal shall be filed with the Building Code Council c/o NC Department of Insurance, Engineering Division, 325 North Salisbury Street, Room 5_44, Raleigh, NC 27603 and one (1) copy shall be filed with the State enforcement agency from which the appeal is taken.

202.9.2.2 The Notice of Appeal shall be received no later than thirty (30) days from the date of the decision of the State enforcement agency.

202.9.2.3 The Notice of Appeal shall be legibly printed, typewritten or copied and shall contain the following:

- (1) Name, address of the party or parties requesting the appeal.
- (2) The name of the State enforcement agency, the date of the decision from which the appeal is taken, and a copy of the written decision received from the enforcement agency.
- (3) The decision from which the appeal is taken shall be set forth in full in the Notice of Appeal or a copy of the decision shall be attached to all copies of the Notice of Appeal.
- (4) The contentions and allegations of fact must be set forth in full in a clear and concise manner with reference to the sections of the code in controversy.
- (5) The original Notice of Appeal shall be signed by the party or parties filing appeal.
- (6) The Notice of Appeal shall be received by the first day of the month prior to the Building Code Council's quarterly scheduled meeting in order to be placed on the agenda for that meeting. The Chairman may schedule a special meeting to hear an appeal.

202.9.2.4 Upon the proper filing of the Notice of Appeal, the Building Code Council Secretary shall forward one (1) copy of the Notice of Appeal to each member of the Building Code Council. The Chairman may appoint a Hearing Committee to hear appeals. The Secretary shall send notice in writing to the party or parties requesting an appeal and to the Building Code Council Hearing Committee members at least fifteen (15) days prior to the Hearing Committee meeting. A written decision of the Hearing Committee meeting shall be provided to all Building Code Council Members. The actions of the Hearing Committee shall be final, unless appealed to the full Building Code Council in writing within 30 days of the Hearing Committee's action. If a Hearing Committee consists of at least seven Council members, it will constitute a quorum of the full Council. Further appeals shall be as specified in Section 202.9.3.

202.9.2.5 The Building Code Council shall, upon a motion of the State enforcement agency or on its own motion, dismiss appeals for the following reasons:

- (1) Not pursued by the appellant or withdrawn;
- (2) Appeal not filed in accordance with these rules; or
- (3) Lack of jurisdiction.

202.9.2.6 When the Building Code Council finds that a State enforcement agency was in error in its interpretation of the code, the Building Code Council shall remand the case to the agency with instructions to take such actions as the Building Code Council directs. When the Building Code Council finds on appeal that materials or methods of construction proposed are equivalent to those required by the code, the Building Code Council shall remand the case to the State enforcement agency with instructions to permit the use of such materials or methods of construction. The Building Code Council shall immediately initiate procedures for amending the code to permit the use of such materials or methods of construction.

202.9.2.7 The Building Code Council shall provide a written decision setting forth the findings of fact and the Building Code Council's conclusions to each party or parties filing the appeal and to the State enforcement agency from which the appeal was taken.

202.9.3 Superior Court. Whenever any person desires to appeal a decision of the Building Code Council or a decision of a State or local enforcement agency, he may appeal either to the Wake County Superior Court or the Superior Court of the county in which the proposed building is to be situated in accordance with the provisions of Chapter 150B of the General Statutes.
(General Statute 143-141(d))

From: [Josh Seymour](#)
To: [Register, Julius](#)
Cc: [Hyatt, John](#); [Edward Schofield](#); [Donald J. Haurert](#); [Jesse@evergreenfoam.com](#); [Lee, Rudolph](#); [Tuttle, Mark](#); [Sheffield, Don](#); [Lovings, Randy](#)
Subject: RE: SECU Greensboro Spray Foam Barrier
Attachments: [image001.gif](#)
[image002.jpg](#)
[image003.jpg](#)
[ESR-2642.pdf](#)
[1 - BASF SPF-C Spraytite 178-F TDS 210108.pdf](#)
[2 - Coating DC315 TDS 210707.pdf](#)
[City of Greensboro - Alternate Material Request - 20221006.pdf](#)

Julius,
See attached as requested below

From: Register, Julius [mailto:Julius.Register@greensboro-nc.gov]
Sent: Friday, September 23, 2022 1:21 PM
To: Sheffield, Don <Donald.Sheffield@greensboro-nc.gov>; Josh Seymour <JSeymour@mcdonaldyork.com>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>
Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Paul Munds <PMunds@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>
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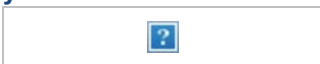
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Thanks and let me know should you have any additional questions.

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Project Manager

McDonald York Building Company
801 Oberlin Rd, Suite 235 | Raleigh, NC 27605
t:(919) 832-3770 d:(919) 277-1383 c:(919) 268-9046



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From: [Josh Seymour](#)
To: [Register, Julius](#); [Sheffield, Don](#)
Cc: [Hyatt, John](#); [Edward Schofield](#); [Donald J. Haurert](#); [Jesse@evergreenfoam.com](#); [Lee, Rudolph](#); [Tuttle, Mark](#); [Lovings, Randy](#)
Subject: RE: SECU Greensboro Spray Foam Barrier
Attachments: [image001.gif](#)
[image002.jpg](#)
[image003.jpg](#)
[Alternative Thermal Barrier Letter.pdf](#)

Julius/Don,

See attached response for the alternative thermal barrier. We would like to get this resolved and we felt the best way to resolve this would be to have a call to discuss. If you could please send me times that you're available and we can schedule a conference call.

Thanks for your quick attention to this matter and let me know should you have any additional questions.

From: Register, Julius [mailto:Julius.Register@greensboro-nc.gov]
Sent: Monday, October 17, 2022 9:19 AM
To: Josh Seymour <JSeymour@mcdonaldyork.com>
Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Sheffield, Don <Donald.Sheffield@greensboro-nc.gov>; Lovings, Randy <Randy.Lovings@greensboro-nc.gov>; Hyatt, John <John.Hyatt@greensboro-nc.gov>
Subject: RE: SECU Greensboro Spray Foam Barrier

Josh,

Don Sheffield and I discussed this. Don has advised me the location is in a plenum above the ceiling. The ESR-2642, Section 4.4.2, item c. states that "Air in the attic or crawl space is not circulated to other parts of the building". This material can't be used in a plenum. The required standard, NFPA 275, is not listed as a characteristic of the material anyway.

I suggest you discuss other options for complying with NCBC 2603.4 with the field inspector.

Thanks!

Julius Register

Plan Review Supervisor
Inspections Department
City of Greensboro

P.O. Box 3136, Greensboro, NC 27402-3136

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From: Josh Seymour <JSeymour@mcdonaldyork.com>
Sent: Monday, October 10, 2022 3:10 PM
To: Register, Julius <Julius.Register@greensboro-nc.gov>
Cc: Hyatt, John <John.Hyatt@greensboro-nc.gov>; Edward Schofield <ESchofield@mcdonaldyork.com>; Donald J. Haurert <DHaurert@bhdp.com>; Jesse@evergreenfoam.com; Lee, Rudolph <Rudolph.Lee@greensboro-nc.gov>; Tuttle, Mark <Mark.Tuttle@greensboro-nc.gov>; Sheffield, Don <Donald.Sheffield@greensboro-nc.gov>; Lovings, Randy <Randy.Lovings@greensboro-nc.gov>
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Project Manager

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t:(919) 832-3770 d:(919) 277-1383 c:(919) 268-9046



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From: [Ryan Brown](#)
To: [Josh Seymour](#)
Subject: FW: SECU Greensboro Spray Foam Insulation
Date: Tuesday, September 20, 2022 11:26:12 AM
Attachments: [image001.jpg](#)
[Installation Letter - SECU Greensboro.pdf](#)
[1- NCFI Authorized Contractor Letter 210106.PDF](#)

See attached.

From: Ryan Brown
Sent: Wednesday, September 14, 2022 3:54 PM
To: Edward Schofield <ESchofield@mcdonaldyork.com>
Subject: FW: SECU Greensboro Spray Foam Insulation

See attached.

Ryan Brown

Project Engineer

McDonald York Building Company
801 Oberlin Rd, Suite 235 | Raleigh, NC 27605
o:(919) 277-1049 c:(919) 410-2343

- [Join Our Team](#)

-

-

- ----- Original message -----

From: Ryan Brown <RBrown@mcdonaldyork.com>
Date: 12/7/21 12:04 PM (GMT-05:00)
To: sherri.york@greensboro-nc.gov
Cc: Drew Hicks <DHicks@mcdonaldyork.com>
Subject: [SECU Greensboro Spray Foam Insulation](#)

-

Sherri,

-

[Please see attached letters from Evergreen and please let me know if this is what you are looking for to sign off on the inspection for 2200 Pincroft Rd. Greensboro NC, 27407.](#)

-

-

Thanks,

[Ryan](#)

-

Ryan Brown

- **McDonald York Building Company**
801 Oberlin Rd. Suite 235 | Raleigh, NC 27605
o:(919) 832-3770 c:(919) 410-2343



- [Join Our Team](#)

-
-

From: [Ryan Brown](#)
To: [Josh Seymour](#)
Subject: FW: SECU Greensboro Spray Foam Insulation
Date: Tuesday, September 20, 2022 11:26:58 AM
Attachments: [image001.jpg](#)

See below.

From: Ryan Brown
Sent: Wednesday, September 14, 2022 3:54 PM
To: Edward Schofield <ESchofield@mcdonaldyork.com>
Subject: FW: SECU Greensboro Spray Foam Insulation

See below.

Ryan Brown

Project Engineer

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801 Oberlin Rd, Suite 235 | Raleigh, NC 27605
o:(919) 277-1049 c:(919) 410-2343

-
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-
----- Original message -----

From: "York, Sherri" <Sherri.York@greensboro-nc.gov>
Date: 12/7/21 1:52 PM (GMT-05:00)
To: Ryan Brown <RBrown@mcdonaldyork.com>
Cc: Drew Hicks <DHicks@mcdonaldyork.com>
Subject: RE: SECU Greensboro Spray Foam Insulation

-
[I just signed off the inspection in the system.](#)

From: Ryan Brown <RBrown@mcdonaldyork.com>
Sent: Tuesday, December 7, 2021 12:04 PM
To: York, Sherri <Sherri.York@greensboro-nc.gov>
Cc: Drew Hicks <DHicks@mcdonaldyork.com>
Subject: SECU Greensboro Spray Foam Insulation

-
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-
[Sherri,](#)

-
[Please see attached letters from Evergreen and please let me know if this is what you are looking for to sign off on the inspection for 2200 Pinecroft Rd. Greensboro NC, 27407.](#)

-
-
-
Thanks,

Ryan

-
-
Ryan Brown

-
McDonald York Building Company

[801 Oberlin Rd. Suite 235 | Raleigh, NC 27605](#)

[o:\(919\) 832-3770 c:\(919\) 410-2343](#)



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[Join Our Team](#)

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BASF Technical Data Sheet

We create chemistry

SPRAYTITE® 178 Series BUILDING ENVELOPE INSULATION ICC-ES ESR-2642, Intertek CCRR-1031

DESCRIPTION:

SPRAYTITE 178 is a two-component closed-cell spray polyurethane foam system utilizing an EPA-approved, zero ozone-depleting blowing agent. It is designed for use in residential construction and common commercial insulation applications. **SPRAYTITE 178** is compatible with most common construction materials, but can only be processed with ELASTOSPRAY® 8000A Isocyanate. The benefits of **SPRAYTITE 178** include:

- Superior insulation
- Controls moisture infiltration
- Controls air infiltration
- FEMA Class 5 flood-damage resistant rated material
- Non-fibrous
- Structural enhancement
- Speed of installation

REACTIVITIES AVAILABLE	AMBIENT TEMPERATURE RANGE
SPRAYTITE 178 XF	20°F to 65°F
SPRAYTITE 178 F	60°F to 120°F

TYPICAL PROPERTIES⁽¹⁾

PROPERTY	METHOD	SPRAYTITE 178
Resin:		
Specific Gravity @ 70°F	ASTM D 1638	1.175
Viscosity @ 70°F (cps)	Brookfield	500
Cured Foam:		
Density, core (pcf @ 2" lifts)	ASTM D 1622	2.0 – 2.3
Thermal Resistance (aged)		
k-factor (Btu in/ft ² hr °F)	ASTM C 518	0.149 @ 1-in thick 0.145 @ 4-in thick
R-value (ft ² hr °F/Btu in) ⁽²⁾	Calculated	6.7 / in @ < 4-in thick 6.9 / in @ ≥ 4-in thick
Compressive Strength (psi)	ASTM D 1621	26 +/- 5% ^A
Water Vapor Transmission – Permeability (perm-inch)	ASTM E 96	1.39
Water Vapor Transmission – Permeance (perms)	ASTM E 96	<1.0 @ 1.50" thickness (Class II vapor retarder)
Air Leakage (L/s*m ² @ 75 Pa ΔP)	ASTM E 283	<0.005 @ 1.0 inch (Air impermeable)
Water Absorption (vol %)	ASTM D 2842	0.60
Tensile Strength (psi)	ASTM D 1623	62.4 (Type C)
Response to Thermal and Humid Aging (% linear change)		
158°F / 97% RH / 168 hrs	ASTM D 2126	4.9
Closed Cell Content (%)	ASTM D 6226	98
Surface Burning Characteristics		
Flame Spread Index ⁽³⁾	ASTM E 84	≤ 25
Smoke Developed Index	ASTM E 84	≤ 450

^AThe coefficient of thermal expansion varies between 3×10^{-5} and $4 \times 10^{-4} 1/K$ or 1.5×10^{-5} and $2 \times 10^{-4} 1/°F$. The lower end of the range relates to closed-cell SPF while the higher values were reported for open-cell foams.

ADDITIONAL TESTING, APPROVALS & CERTIFICATIONS:

- ASTM E 84 (Class I) with Product Listing ⁽³⁾ ⁽⁴⁾
- NFPA 285 complying assemblies available
- Fire Resistant assemblies available
- ICC-ES Evaluation Report ESR-2642; including Seal & Insulate with ENERGY STAR® Supplement
- INTERTEK Code Compliance Research Report CCRR-1031
- ASTM C 1029 – Type II Compliant
- Thickness is not limited when installed behind a code-prescribed thermal barrier (per ICC-ES AC377)
- Approved for Attics & Crawl Spaces Installations with and without prescriptive ignition barriers per ICC-ES AC377, Appendix A1.2.2 and Appendix X
- Florida Building Code Approval *FL 13001 – Spray Polyurethane Foam Adhesive System; Fillet Application (Outside HVHZ)*
 - *Fillet and Full Insulating Layer applications*
 - *Plywood and OSB decks*
 - *Design Pressure range = -160 psf to -293 psf*
- Miami-Dade NOA 17-0725-04
 - *Subcategory; Wood Connectors – Design Pressure +/- 125 psf*
- California Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation
- GREENGUARD and GREENGUARD Gold Certification for VOC emissions
- Meets the requirements of CDPH Section 01350 for VOC emissions and formaldehyde
- Mold resistant per ASTM C1338 – “Pass” rating (no growth)

Odor level of spray polyurethane foam is dependent on proper application using the recommended processing parameters and proper ventilation.

Please contact your local Sales or Technical Representative for specific questions regarding **SPRAYTITE 178** properties, approvals, or certifications.

(1) These physical property values are typical for this material as applied at our development facility under controlled conditions. SPF performance and actual physical properties will vary with differences in application (i.e. ambient conditions, process equipment and settings, material throughput, etc). As a result, these published properties should be used as guidelines solely for the purpose of evaluation. Physical property specifications should be determined from actual production material.

The above data was collected from samples prepared using equipment configurations pertinent to lab conditions. Parameters can be obtained upon request by calling 800-706-1712. (2) The data chart shows the R-value of this insulation. “R” means resistance to heat flow. The higher the R-value, the greater the insulating power. Compare insulation R-values before you buy. There are other factors to consider. The amount of insulation will depend upon the climate, the type and size of your house, and the fuel use patterns and family size. If you buy too much insulation it will cost you more than what you will save on fuel. To achieve proper R-values, it is essential that this insulation be installed properly.

(3) This numerical flame spread rating does not reflect hazards presented by this or any other material under actual fire conditions. Polyurethane foam systems should not be left exposed and must be protected by a minimum 15-minute thermal barrier or other code-compliant material as allowed by applicable building code(s) and Code Officials. Building Codes provide guidelines representing minimum requirements. Further information is available at www.iccsafe.org. Consult all Authorities Having Jurisdiction (AHJ) over an area for additional or specific requirements prior to beginning any project.

(4) ASTM E 84 is a test designed for sample thickness up to four (4) inches. NFPA 286 is a building code recognized alternative test conducted on large-scale assemblies to evaluate foam thickness in excess of four (4) inches as permitted in 2012 IBC Section 2603.10; 2006 & 2009 IBC Section 2603.9; 2009 & 2012 IRC Section R316.6; 2006 IRC Section R314.6.

spraytite®
Closed-Cell Spray Polyurethane Foam Insulation



BASF Corporation
1703 Crosspoint Avenue
Houston, TX 77054
(800) 706-0712
www.spf.basf.com

Revision Date: August 28, 2020

Page 1 of 2



SPRAYTITE 178® SERIES BUILDING ENVELOPE INSULATION ICC-ES ESR-2642, INTERTEK CCRR-1031

GENERAL INFORMATION:

SPRAYTITE 178 is a spray polyurethane foam (SPF) system intended for installation by qualified contractors trained in the processing and application of SPF systems, as well as the plural-component polyurethane dispensing equipment required to do so. Contractors and applicators must comply with all applicable and appropriate storage, handling, processing and safety guidelines. BASF technical service personnel should be consulted in all cases where application conditions are questionable.

SPRAYTITE 178 has an estimated theoretical yield range of 4,200-4,800 board feet per set. Actual yield performance can be in excess of or below the referenced estimated theoretical range based on factors affecting density including, however, not limited to: multiple lifts, substrate texture, substrate temperature, overspray loss, windy conditions, altitude, container residue, equipment characteristics & temperatures, applicator technique, etc. For help estimating yield for this and other spray foams, please consult Spray Polyurethane Foam Alliance's SPFA-121 SPF Estimating Reference Guide.

CAUTIONS AND RECOMMENDATIONS:

SPRAYTITE 178 is designed for an application rate of ½ inch minimum to 2 inches maximum per pass. Proper cooling or dwell time is required between passes (minimum 15 minutes per pass applied). Once installed and material has cooled it is possible to add additional applications in order to increase the overall installed thickness of SPF. Thicker installations are allowed based on large scale testing. Please see ESR-2642 for additional information. This application procedure is in compliance with the Spray Polyurethane Foam Alliance (SPFA).

SPRAYTITE 178 is NOT designed for use as an EXTERIOR roofing system. BASF offers a separate line of products for exterior roofing applications. For more information, please contact your sales representative. Cold-storage structures such as coolers and freezers demand special design considerations with regard to thermal insulation and moisture-vapor drive. SPRAYTITE 178 should NOT be installed in these types of constructions unless the structure was designed by a design professional for specific use as cold storage.

SPRAYTITE 178 is designed for installation to most standard construction materials such as wood, wood based products, plastics, metal and concrete. SPRAYTITE 178 has performed successfully when sprayed onto wood substrates down to 20°F using special cold weather application techniques. For heat sink-materials such as metal or concrete, SPRAYTITE 178 can be sprayed onto substrates down to 30°F, using a flash pass method. BASF recommends the use of mock ups or sample spray before starting the full-scale project. This will provide an opportunity to see how all materials are installed and evaluate their properties prior to proceeding. Please consult a BASF Representative for further information about applications using our liquid compounds.

Foam plastic materials installed in walls or ceilings may present a fire hazard unless protected by an approved, fire-resistant thermal barrier with a finish rating of not less than 15 minutes as required by building codes. Rim joists/header areas, in accordance with the IRC and IBC, may not require additional protection. Foam plastic must also be protected against ignition by code prescribed or properly tested materials in attics and crawl spaces. See relevant Building Codes and www.iccsafe.org for more information.

Important Material Preparation Note: Product should be stored at 50-80°F. Materials should be prepared for processing by being warmed to 70°F minimum at least 24 hours prior to installation and maintained at 70°F during the install process.

EQUIPMENT SETTING GUIDELINES		
Climate	A side, B side, Hose Temp (Adjust in +/- 5° increments)	Proportioner set pressure (Spraying pressure)
Colder	120°F – 130°F	1150 – 1450 psi (900 – 1200 psi)
Warmer	110°F – 125°F	1150 – 1450 psi (900 – 1200 psi)

In addition to reading and understanding the SDS, all contractors and applicators must use appropriate respiratory, skin and eye Personal Protective Equipment (PPE) when handling and processing polyurethane chemical systems. Personnel should review related industry and best practice documents published by organizations such as Spray Polyurethane Foam Alliance (SPFA), OSHA, Spray Foam Coalition (SFC) and American Chemistry Council / Center for the Polyurethanes Industry (CPI)

As with all SPF systems, improper application techniques should be avoided. Examples of improper application techniques include, but are not limited to excessive thickness of SPF, off-ratio material and spraying into or under rising SPF. Potential results of improperly installed SPF include: dangerously high reaction temperatures that may result in fire and offensive odors that may or may not dissipate. Improperly installed SPF must be removed and replaced with properly installed materials.

LARGE MASSES of SPF should be removed to an outside safe area, cut into smaller pieces and allowed to cool before discarding into an appropriate trash receptacle.

SPF insulation is combustible. High-intensity heat sources such as welding or cutting torches must not be used in contact with or in close proximity to SPRAYTITE 178 or any polyurethane foam. The insulation must not be used in areas that have a maximum service temperature greater than 180°F(82°C).

SHELF LIFE AND STORAGE CONDITIONS:

SPRAYTITE 178 Series has a shelf life of approximately six (6) months from the date of manufacture when stored in original, unopened containers at 50-80°F. As with all industrial chemicals this material should be stored in a covered, secure location and never in direct sunlight. Storage temperatures above the recommended range will shorten shelf life. Storage temperatures above the recommended range may also result in elevated headspace pressure within packages.

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY:

The information herein is to assist customers in determining whether our products are suitable for their applications. Our products are only intended for sale to industrial and commercial customers. Customer assumes full responsibility for quality control, testing and determination of suitability of products for its intended application or use. We warrant that our products will meet our written liquid component specifications. We make no other warranty of any kind, either express or implied, by fact or law, including any warranty of merchantability or fitness for a particular purpose. Our total liability and customers' exclusive remedy for all proven claims is replacement of nonconforming product and in no event shall we be liable for any other damages.

While descriptions, designs, data and information contained herein are presented in good faith and believed to be accurate, they are provided for guidance only. Because many factors may affect processing or application/use, BASF recommends that the reader make tests to determine the suitability of a product for a particular purpose prior to use. No warranties of any kind, either expressed or implied, including warranties of merchantability or fitness for a particular purpose, are made regarding products described or designs, data or information set forth, or that the products, designs, data or information may be used without infringing the intellectual property rights of others. In no case shall the descriptions, information, data or designs provided be considered a part of BASF's terms and conditions of sale. Further the descriptions, designs, data, and information furnished by BASF hereunder are given gratis and BASF assumes no obligation or liability for the description, designs, data or information given or results obtained, all such being given and accepted at the reader's risk.

Warning: These products can be used to prepare a variety of polyurethane products. Polyurethanes are organic materials and must be considered combustible.

July 14, 2011

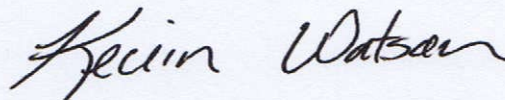
Re: Evergreen Foam & Insulation

To Whom It May Concern:

This letter is for the purpose of verifying that Evergreen Foam & Insulation, located in Raleigh, NC, is an authorized contractor of spray foam insulation products manufactured by NCFI. Evergreen has completed all required training by and received certification from NCFI.

Best Regards,

NCFI Polyurethanes



Kevin Watson
Account Manager
Specialty Products



DC315 Intumescent Coating

Description

DC315 is a single component, water based intumescent coating tested to meet Building Code requirements for the fire protection of for Spray Polyurethane Foam (SPF). Tested and evaluated in the USA by UL and ICC-ES, and in Canada by ULC and CCMC.

DC315 is fully AC456 Compliant and satisfies the International Building Code (IBC), International Residential Code (IRC), National Building Code of Canada (NBCC) and many other National and International building codes.

DC315 offers more tested systems to meet interior thermal and ignition barrier requirements AND DC315 has been tested as a component of exterior wall systems in accordance with the NFPA 285 and meets IBC Section 2603.5 with various architectural cladding options.

The Choice is clear, DC315 is the most tested and approved fire protective coating for SPF insulation on the market today!



DC315 Tested Solutions for Spray Polyurethane Foam

- More certified full scale Thermal and Ignition Barrier tests over SPF
- Code Compliance Evaluated by [IAPMO ER-499](#) and [ICC-ESR 3702](#) for the **USA market**
- Code Compliance Evaluated by [CCMC #14036-R](#) and [ULC ER39793](#) for the **Canadian market**
- NFPA 285 Tested and Listed by UL [File R40016](#) as a component of exterior wall systems with various architectural claddings
- DC315 manufacturing facilities are [3rd party Listed](#) and Inspected
- Tested useful life, fire performance not compromised after 50 years.
- Topcoat for color, weather and moisture protection, tested full scale via NFPA 286
- [ANSI 51](#) testing for incidental food contact
- Passed [CA-1350](#) - qualifies DC315 as a low-emitting material for [LEEDS](#) and Green Building standards
- Passed strict EPA – [VOC](#) and AQMD air emission requirements
- No formaldehyde, RoHS
- “Single Coat Coverage” on walls and ceilings
- Meets Life Safety Code NFPA 101

Specifications:

Finish:	Flat
Color:	Ice Gray, White and Charcoal Black
	10.3 g/l TVOC
V.O.C.:	18.6 g/l VOC Less Water
Volume Solids:	67%
Drying Time:	To Touch: 1-2 hours
at 77°F & 50% RH	recoat: 4 to 8 hours
Type of Cure:	Coalescence
Flash Point:	None
Reducer/Cleaner:	Water
Shelf Life:	18-24 months (unopened)
Packaging:	5- & 55-gallon containers
	5-gallon pail - 58 lbs.
Shipping weight:	55-gallon drum - 640 lbs.
Application:	Brush, roller, airless spray
QAI Listed:	File B1117



***FOR USA ONLY -View our online [Testing Matrix](#) for a complete list of all foams DC315 has been tested and approved with as Thermal or Ignition barriers.**

International Building Code Fire Performance Requirements for SPF: The International Building Code (IBC) mandates that SPF be separated from the interior of the building by a 15-minute thermal barrier, or other approved covering. DC315 passed certified **NFPA 286** testing over all major brands and types of open and closed cell spray applied polyurethane foams. This finished assembly testing, conducted by IAS certified testing facilities, complies with the requirements of 2012 IBC Section 803.1.2 and Section 2603.10., 2015 IBC Section 2603.9 and Section 803.1.

Alternative Ignition Barrier Assemblies: DC315 meets the requirements for ignition barrier protection in unoccupied spaces as per **AC 377, Appendix X**.

Exterior Wall Systems: DC315 has been tested as a component of exterior wall systems in accordance with the NFPA 285 and meets 2015 IBC Section 2603.5 with various architectural cladding options.

National Building Code of Canada: DC315 prevents flashover for 10 minutes for Combustible Construction or 20 minutes for Non-Combustible construction when tested to the CAN/ULC S-145 Standard. This testing has been shown to exceed the protection of CAN/ULC S-124 tested materials and meets the Intent of NBC Section 3.1.5.12 for the protection of foamed plastics.

European Union: DC315 has been tested over both medium density and low-density spray polyurethane foam and provides an EN13501- 1 Fire Classification of B-S2-D0.

Australia and New Zealand: DC315 has been tested to the AUS ISO- 9705 standard over spray polyurethane foam and meets Group 2 Classification. ISO5660 (part 1 and 2) tests confirm Group number classification as 1 which allows for the addition of the thermal barrier coating to upgrade the fire rating of the underlying spray foam.

END USE APPLICATIONS: DC315 is designed for interior conditioned spaces. It is the responsibility code and inspection authorities, architects, specifiers, contractors, installers or any end user of IFTI products to Contact IFTI to discuss their application to ensure it complies with manufacturers recommendations and meets their intended end use. The use of topcoats, though not required to meet the fire rating, may be included as part of the overall system to address specific conditions required for the project and address use in specified conditions such as, but not limited to, exterior wall systems, cold storage, parking garages or high humidity environments.

Testing

USA

- **ASTM E84** - Flame Spread 0 Smoke 10
- **NFPA 286** - Complies with Acceptance Criteria of IBC/IRC
- **ASTM E2768** - 30-minute Ignition Resistant Material
- **NFPA 285** - Exterior Wall System with various claddings

Canada

- **CAN/ULC S102** - FSR 0 SDC 25
- **CAN/ULC S 101** – up to 1 hr assembly rating
- **CAN/ULC 9705** - 10- and 20-minute testing
- **CAN/ULC S-145** – 20 Minute Rating

European Union

- **BS 476 Part 6 & 7**
- **BS EN ISO 11925-2**
- **EN 13823**
- **EN 13501** Classification B-S2-d0

Australia/New Zealand AUS ISO 9705

- **AS/NZS 1530.3**
- **AS 5637.1** Group Classification 2, NZBC Group 2-S
- **ISO 5660 Parts 1 and 2**

Physical Properties Testing

- **ASTM D522** Flexibility, Mandrel Bend
- **ASTM D4541** Adhesion pull off strength
- **ASTM D4585** Moisture resistance for 100 hours
- **ASTM D4587 / ASTM G154** Accelerated Weather QUV 1000 hours
- **ASTM D3359** Tape Adhesion
- **ASTM D2486** Scrub Resistance
- **ASTM E661** Durability, Impact, Concentrated load



International Fireproof Technology Inc.
The Ultimate in Firestop Solutions and Fire Protective Coatings

International Fireproof Technology, Inc.
17528 Von Karman Ave. Irvine, CA 92614

Office: 949-975-8588
Web Site: www.painttoprotect.com
Email: ptp@painttoprotect.com

BHDP

November 1, 2022

Don Sheffield
Chief Building Inspector
City of Greensboro

RE: Section 105
Alternate material, design or methods

Mr. Sheffield,

We have reviewed this question with your staff and believe we may be able to clarify the issues of the alternate fire-resistant material covering spray-on foam plastic insulation on exterior walls.

ICC ESR-2642 in Section 1.0 includes an evaluation of compliance with the 2021, 2018, 2015, 2012 and 2009 International Building Codes. The properties evaluated included in the ESR not only the physical properties of the materials, but their application and use in the following and other circumstances. In this project it is for an exterior wall:

- Attic and crawl spaces
- Fire-resistive barrier
- Fire-resistance-rated construction
- Exterior walls in Types I through IV construction

The material under consideration is use of BASF DC315 on walls covered by spray applied insulation in a plenum space, not an attic. The plenum is enclosed by a ceiling above the windows and below the underside of the floors and roof above. Section 2603.4 of the NCBC prescribes a ½ inch thick gypsum wallboard, or a material meeting NFPA 275's Temperature Transmission Fire Test and Integrity Fire Test for installations of spray applied foam plastic insulation.

ICC ESR-2642 has evaluated BASF DC315 for an equivalent level of performance as required in Section 2603.4 of NCBC.

As noted in Julius Register's email of 10/17/2022, Section 4.4.2, item c. of ICC ESR-2642 is specific to spaces in an attic or crawl space, however the space between the ceiling and the floor above is not an attic space but is classified as a plenum according to the NCMC, Section 202.

Plenum. *An enclosed portion of the building structure, other than an occupiable space being conditioned, that is designed to allow air movement, and thereby serve as part of an air distribution system.*

The specific area where the DC315 material is being installed is not an attic or a crawl space. ESR-2642 Section 4.3.2 is specifically designed for applications without a prescriptive thermal barrier. In this section of ESR-2642 it states:

4.3.2 Application without a prescriptive thermal barrier: The SPRAYTITE© (Comfort, Comfort Plus, Comfort XL, LWP-L, SP, 158, 178 and 81206) and WALLTITE© (LWP, Plus and US) insulations may be installed without the thermal barrier prescribed in IBC Section 2603.4 and ICC Section R316.4 in assemblies conforming to one of those described in Table 2. The insulation may be left exposed where indicated in table 2.

Table 2 of ESR-2642 specifically shows the use of SPRAYTITE (Comfort, Comfort Plus, Comfort XL, LWP-L and SP) as being allowed with a maximum thickness of 5½” of sprayed insulation with a fire-protective coating of DC315 when 20 wet mils of thickness are applied and is allowed to remain exposed as an interior finish based on NFPA 286.

NFPA 286 is specifically designed as a Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth. Using this test method for DC315 application over sprayed on insulation, the IES has been deemed it equivalent to that which is prescribed in Section 2603.4.

We therefore request approval for the installation of DC315, as shown in ICC ESR-2642, Section 4.3.2. Based on the evaluation services it is shown to meet the standard required as an equivalent to the specific requirements in Section 2603.4 of the 2018 edition of the ICC International Building Code. Section 105.1 of the NCBC establishes the procedures and process for gaining this approval and we have offered substantial information to support our request.

Sincerely,



Donald J. Haurert III, AIA, LEED AP
BHDP Architecture
150 Fayetteville Street, Suite 820
Raleigh, North Carolina 27601
P 919.683.1084
www.bhdp.com



EVERGREEN Foam & Insulation

Date:

12/7/2021

Project:

2200 Pinecroft Road, Greensboro, NC
27407

1416 Gavin Street, Suite 101, Raleigh, NC 27608

www.evergreenfoam.com

F: 919.755.4088 T: 888.830.FOAM

INSTALLATION STATEMENT (1) Spray Foam

Location	Product Description	Average Depth (2)	Thermal Resistance Value (3)	Effective Performance Value (4)	Indicated Area
Exterior Walls, Above Ceiling	Closed Cell Spray Foam	3-4	R-25	R-38	11375
Exterior Walls, Below Windows	Closed Cell Spray Foam	3-4	R-25	R-38	5580

Insulation

Location	Product Description	Average Depth (2)	Thermal Resistance Value (3)	Effective Performance Value (4)	Indicated Area

Crawl Space

Location	Product Description	Average Depth (2)	Thermal Resistance Value (3)	Effective Performance Value (4)	Indicated Area

NOTES: 1) See HERS Report provided by Client or ResCheck Compliance Certificate (Note 6) for Code compliance; 2) Average Depth indicates average inches of application depth of corresponding spray foam application and ranges based on product; 3) Thermal Resistance Value indicates nominal r-value according to manufacturer materials and corresponding application based on greatest of avg. depth; 4) Effective Performance Value indicates performance-based energy efficiency value (5) of corresponding application; 5) As a certified air barrier, the performance of spray foam significantly exceeds nominal thermal resistance values based on engineered design certification by a licensed engineer as provided by Section R301 of the Code; the performance-based value of installed fiberglass batts is less than published nominal r-values based on fiberglass manufacturer statements and Oak Ridge National Lab testing; 6) ResCheck inputs may reflect engineer design certification effective thermal performance values and not nominal thermal resistance values, and other assumptions not included in the scope of work indicated above including, among other things, assumptions relating to windows, doors, framing, slab, crawl space, thermal bridging, u-factors, solar heat gain co-efficients and continuous nominal thermal resistance values (Note 7) of framing materials; 7) Continuous nominal thermal resistance value assumptions are based on ASHRAE Handbook (2012) and Advanced Energy.

Installer: Evergreen Foam & Insulation

Contact: 919.755.5001

Date: 12/7/2021



EVERGREEN Foam & Insulation

Date:

12/7/2021

Project:

2200 Pinecroft Road, Greensboro, NC
27407

1416 Gavin Street, Suite 101, Raleigh, NC 27608

www.evergreenfoam.com

F: 919.755.4088 T: 888.830.FOAM

INSTALLATION LETTER – SPRAY FOAM

To Whom It May Concern –

Based on work schedule on the date indicated above, this letter confirms that spray foam should be installed at 2200 Pinecroft Road, Greensboro, NC 27407 in a manner consistent with manufacturer recommendations, the attached ESR report and relevant NC Building Code.

Please do not hesitate to contact Evergreen with any questions at all.

Sincerely,

Evergreen Foam & Insulation

BHDP

10.06.2022

City of Greensboro North Carolina
Development Services - Inspection Department
PO Box 3136
Greensboro, NC 27402-3136

To Whom it concerns,

This letter is being submitted by request of the inspector for the consideration of an alternate material, design, or method under Section 105 of the NC Administrative Code.

The project was specified and approved for a permit using spray foam insulation. The insulation was applied in the project using BASF Spraytite 178 series for areas above the exterior windows in the ceiling plenum. The inspector noted that the material was not an approved use.

According to the 2018 North Carolina, Building Code section 2603.3 Foam plastic insulation must have a flame spread rating of less than 75 and a smoke-developed index of less than 450 when tested in accordance with ASTM E84 or UL 723.

The Manufacturer's test data notes it meets the above-listed surface burning characteristics but requires a thermal barrier. This thermal barrier was not installed by the Contractor, and we are proposing adding an intumescent coating to comply with the manufacturer's test data. Several products are suggested by the manufacturer, one of which is IFTI DC315 Intumescent Coating at a minimum thickness of 4 mil wet.

It is our request that this coating is added to meet and comply with the 2018 NCBC Section 2603.3 requirements. This alternate meets or exceeds the intent and provision of this section.

All referenced Manufacturer's data is attached.

Sincerely,



Lawrence DiGennaro

BHDP Architecture
150 Fayetteville St, Suite 820
Raleigh, NC 27601
P 919.683.1084

www.bhdp.com



ICC-ES Evaluation Report ESR-2642

Reissued February 2022

Revised August 2022

This report is subject to renewal February 2023.

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

EVALUATION SUBJECT:

BASF CORPORATION SPRAY-APPLIED INSULATIONS: SPRAYTITE® (COMFORT, COMFORT PLUS, COMFORT XL, LWP-L, SP, 158, 178 AND 81206) AND WALLTITE® (LWP, PLUS AND US)

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2021, 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2021, 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2021, 2018, 2015, 2012 and 2009 *International Energy Conservation Code*® (IECC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†
- Other Codes (see Section 8.0)

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Physical properties
- Surface burning characteristics
- Thermal resistance
- Water vapor transmission
- Attic and crawl space installation
- Air permeability
- Water-resistive barrier
- Fire-resistance-rated construction
- Exterior walls in Types I through IV construction

1.2 Evaluation to the following green code(s) and/or standards:

- 2019 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2020, 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2020, ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

See Section 2.0

2.0 USES

SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP, 158, 178 and 81206) and WALLTITE® (LWP, Plus and US) spray-applied polyurethane foam insulations are used as nonstructural thermal insulating material in all types of construction under the IBC and dwellings under the IRC. See Section 4.7 for use in exterior walls of Type I, II, III and IV construction. The insulation is for use in wall cavities, floor/ceiling assemblies, exterior side of vertical foundations or the underside of on-grade slabs. It may be used in attic and crawl spaces as described in Section 4.4. Under the IRC and 2021, 2018 and 2015 IBC, the insulation may be used as air-impermeable insulation when installed in accordance with Section 3.5. When installed in accordance with Section 4.5, the insulation may be used as an alternative to the water-resistive barriers required in 2021 and 2018 IBC Section 1403.2 (2015, 2012 and 2009 IBC Section 1404.2) and IRC Section R703.2. The insulation may be used in fire-resistance-rated wall assemblies when construction is in accordance with Section 4.6.

The attributes of the insulation used as a water-resistive barrier have been verified as conforming to the provisions of (i) CALGreen Section 5.407.1; (ii) ICC 700-2020 Sections 602.1.8, 11.602.1.8, 1202.6 and 13.104.1.4; (iii) ICC 700-2015 Section 602.1.8, 11.602.1.8 and 12.6.602.1.8; (iv) ICC 700-2012 Section 602.1.8, 11.602.1.8 and 12.5.602.1.8; and (v) ICC 700-2008 Section 602.9 for water-resistive barriers. The attributes of the insulation have been verified as conforming to the provisions of ICC 700-2008 Section 703.2.1.1.1(c) as an air impermeable insulation. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.0 DESCRIPTION

3.1 General:

SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP, 158, 178 and 81206) and WALLTITE® (LWP, Plus and US) are two-component, closed-cell, rigid foam plastic insulations. The insulations are produced in the field by combining an isocyanate component A with a resin component B, resulting in products having a nominal density of 2.0 pcf (32 kg/m³). SPRAYTITE® and WALLTITE® insulations use an A component designated as ELASTOSPRAY® 8000A. Each insulation uses a different proprietary blend for the B component. The insulation components B have a shelf life of six (6) months, except for SPRAYTITE® LWP-L and WALLTITE® Plus which is three (3) months, and components A have a shelf life of twelve (12) months when stored in factory-sealed containers at temperatures between 50°F (10°C) and 80°F (27°C) before installation.

3.2 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 (UL 723) at a maximum thickness of 4 inches (102 mm).

3.3 Thermal Resistance, R-values:

The insulations have thermal resistance (R-values) at a mean temperature of 75°F (24°C) as shown in Table 1.

3.4 Vapor Retarder:

The insulations have a vapor permeance of less than 1 perm [5.72 x 10⁻⁸ g/(Pa•s•m²)], in accordance with ASTM E96 (Desiccant Method), when applied at the following minimum thicknesses, and qualify as Class II vapor retarders:

SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP and 158) = 1.25 inches (32 mm)

SPRAYTITE® (178 and 81206) = 1.50 inches (38 mm)

WALLTITE® (LWP and US) = 1.50 inches (38 mm)

WALLTITE® (Plus) = 1.25 inches (32 mm)

3.5 Air Permeability:

SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP, 158, 178 and 81206) and WALLTITE® (LWP, Plus and US) spray-applied polyurethane foam insulations, at a minimum thickness of 1 inch (25.4 mm), are considered air-impermeable insulation in accordance with 2021, 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4) and 2021 and 2018 IBC Section 1202.3 (2015 IBC Section 1203.3), based on testing in accordance with ASTM E283.

3.6 ALDOCOAT 800 Coating:

ALDOCOAT 800 coating, manufactured by Aldo Products Company, is a single-component, water-based latex coating supplied in 5-gallon pails (19 L) and 55-gallon (208 L) drums. The materials have a shelf-life of six (6) months when stored in a factory-sealed container at temperatures of 40°F (4.5°C) and 90°F (32°C).

3.7 NoBurn® Plus Coating:

NoBurn® Plus coating, manufactured by No-Burn, Inc., is a translucent aqueous liquid supplied in 1- and 5-gallon (4 and 19 L) pails and 55-gallon (208 L) drums. The coating has a shelf life of three (3) years when stored in a factory-sealed container at temperatures between 40°F (4.5°C) and 90°F (32°C).

3.8 NoBurn® Plus XD Coating:

NoBurn® Plus XD coating, manufactured by No-Burn, Inc., is a latex-based coating supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums. The coating has a shelf life of three (3) years when stored in a factory-sealed container at temperatures between 40°F (4.5°C) and 90°F (32°C).

3.9 Flame Seal® TB Coating:

Flame Seal TB coating, manufactured by Flame Seal Products Inc., is a two-component, water-based polymeric intumescent coating, consisting of the Flame Seal TB resin and Flame Seal T50 crosslinking catalyst. The two components are mixed prior to application. The coating is supplied in 5-gallon (19 L) pails (4 gallons (15.1 L) of TB and 1 gallon (3.8 L) of T50) and 50-gallon (189.2 L) drums (40 gallons (151.4 L) of TB and 10 gallon (37.8 L) of T50) and has a shelf-life of twelve months when stored in factory-sealed containers at temperatures between 40°F (4°C) and 90°F (32°C).

3.10 DC 315 Intumescent Coating:

DC 315 Intumescent Coating, recognized in [ESR-3702](#) and manufactured by International Fireproof Technology Inc., is a single-component, water-based, liquid-applied intumescent coating. The coating is supplied in 5-gallon (19L) pails and 55-gallon (208 L) drums and has a shelf-life of one (1) year when stored in factory-sealed containers at temperatures between 50°F (10°C) and 80°F (27°C).

3.11 ICP FIRESHIELD® F10E Coating:

FIRESHIELD® F10E coating, recognized in [ESR-3997](#), manufactured by ICP Construction, is a proprietary single-component, water-based, liquid-applied intumescent coating. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf-life of one (1) year when stored in factory-sealed containers at temperatures between 45°F (7.2°C) and 95°F (35°C).

3.12 ICP FIRESHIELD® (IB4) Coating:

FIRESHIELD® (IB4) coating, manufactured by ICP Construction, is a proprietary single-component, water-based, liquid-applied intumescent coating. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf-life of one (1) year when stored in factory-sealed containers at temperatures between 45°F (7.2°C) and 75°F (24°C).

3.13 FS-IB™ Ignition Barrier Coating:

FS-IB™ Ignition Barrier Coating, manufactured by Flameseal Products, Inc., is a proprietary single-component, water-based latex coating. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf-life of six (6) months when stored in factory-sealed containers at temperatures between 60°F (16°C) and 80°F (27°C).

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 report. The manufacturer's published installation instructions must be available on the jobsite at all times during installation.

4.2 Application:

SPRAYTITE® (Comfort, 158, 178 and 81206) and WALLTITE® (LWP and US) spray-applied polyurethane foam insulations are spray-applied at the jobsite by professional insulation contractors combining an isocyanate component "A" with a resin component "B" using a

volumetric positive displacement pump as recommended in the manufacturer's published installation instructions. The insulation is applied in passes having a minimum thickness of 1/2 inch (12.7 mm) and a maximum thickness per pass as specified in the manufacturer's published installation instructions, up to the total thickness specified in Sections 3.2, 4.3, 4.4, 4.6 and 4.7 of this report. The insulation passes must be allowed to fully expand and be cured for a minimum of 15 minutes per inch prior to application of an additional pass.

SPRAYTITE® (Comfort Plus, Comfort XL, LWP-L and SP) and WALLTITE® Plus spray-applied polyurethane foam insulations are spray-applied at the jobsite by professional insulation contractors combining an isocyanate component "A" with a resin component "B" using a volumetric positive displacement pump as recommended in the manufacturer's published installation instructions. The insulation is applied in passes having a minimum thickness of 1/2 inch (12.7 mm) and a maximum thickness per pass as specified in the manufacturer's published installation instructions, up to the total thickness specified in Sections 3.2, 4.3, 4.4 and 4.6 of this report. The insulation passes must be allowed to fully expand and be cured for a minimum of 10 minutes per inch prior to application of an additional pass, with the exception of Comfort XL. Comfort XL may have additional 3/4-inch-thick (95.3 mm) passes applied immediately over passes that have been applied at 3/4 (95.3) inches per inch or less.

The insulation must not be used in areas that have a maximum service temperature greater than 180°F (82°C). The foam plastic insulation 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 insulation must be protected from the weather during and after application.

4.3 Thermal Barrier:

4.3.1 Application with a Prescriptive Thermal Barrier:

The spray-applied insulations must be separated from the interior of the building by an approved thermal barrier of 1/2-inch-thick (12.7 mm) gypsum wallboard or an equivalent thermal barrier complying with IBC Section 2603.4 or IRC Section R316.4, as applicable, except where installation is in accordance with Section 4.3.2, or in an attic or crawl space as described in Section 4.4, or when the installation is in sill plates and headers at a total thickness of 3/4 inches (83 mm) or less as permitted by IRC Section R316.5.11. There is no thickness limit when installation is behind a code-prescribed thermal barrier, except as noted in Section 4.4.3.

4.3.2 Application without a Prescriptive Thermal Barrier:

The SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP, 158, 178 and 81206) and WALLTITE® (LWP, Plus and US) insulations may be installed without the thermal barrier prescribed in IBC Section 2603.4 and IRC Section R316.4 in assemblies conforming to one of those described in Table 2. The insulation may be left exposed where indicated in Table 2.

4.4 Ignition Barrier – Attics and Crawl Spaces:

4.4.1 Application with a Prescriptive Ignition Barrier:

When the spray-applied 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, except where the installation is in accordance with Section 4.4.2. 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® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP, 158, 178 and 81206) and WALLTITE® (LWP, Plus and US) insulations may be installed in attics and crawl spaces as described in this section 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 2021 and 2018 IBC Section 1202.2 (2015, 2012 and 2009 IBC Section 1203.2) or IRC Section R806, except when air-impermeable insulation is permitted in unvented attics in accordance with 2021, 2018, 2015 or 2012 IRC Section R806.5 (2009 IRC Section R806.4) or 2021 and 2018 IBC Section 1202.3 (2015 IBC Section 1203.3). Under-floor (crawl space) ventilation is provided when required by 2021 and 2018 IBC Section 1202.4 [2015 IBC Section 1203.4, 2012 and 2009 IBC Section 1203.3] or IRC Section R408.1, as applicable.
- Combustion air is provided in accordance with IMC Sections 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 3. 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 3. 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 (10°C). The insulations may be installed in unvented attics as described in this section in accordance with 2021, 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4).

4.4.3 Use on Attic Floors: The SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP, 158, 178 and 81206) and WALLTITE® (LWP, Plus and US) insulations may be installed in accordance with this section and Table 3 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:

The SPRAYTITE® (178 and 81206) and WALLTITE® (LWP, Plus and US) insulations may be used as an alternative to the water-resistive barrier prescribed in 2021 and 2018 IBC Section 1403.2 (2015, 2012 and 2009 IBC Section 1404.2) and IRC Section R703.2, when installed on exterior walls as described in this section.

The insulations 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 (25.4 mm) minimum thickness. All construction joints and penetrations must be sealed with SPRAYTITE® (178 and 81206) or WALLTITE® (LWP, Plus and US) insulation.

4.6 Two-hour Fire-resistance-rated Wall Assemblies (Load-bearing):

SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP and 158) and WALLTITE® Plus may be installed on interior load-bearing two-hour fire-resistance-rated walls, provided the system is installed in accordance with the following:

4.6.1 Wood Framing: Two rows on separate plates, 3 inches (76 mm) apart, of minimum 2-by-4 wood studs (No. 2 Douglas fir) spaced a maximum of 16 inches (406 mm) on center.

4.6.2 Wall Finish: Base layer of 5/8-inch-thick (15.9 mm), Type X gypsum wallboard is applied horizontally and fastened to each outer side of a double row of studs with 6d by 1 7/8-inch-long (48 mm) coated nails, spaced 2 feet (610 mm) on center. Face layer of 5/8-inch-thick (15.9 mm), 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 (60 mm) coated nails, spaced 8 inches (203 mm) on centers. Gypsum wallboard joints must be staggered 24 inches (610 mm) between layers and on opposite sides of the wall.

4.6.3 Insulation: SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP or 158) or WALLTITE® Plus is applied in the stud cavities of both rows at a thickness of 3 inches (76 mm).

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

SPRAYTITE® (Comfort, Comfort XL, 178 and 81206) and WALLTITE® (LWP, Plus and US) 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 as set forth in Table 4 or 6 when installed on the exterior of the sheathing or 3 5/8 inches (92 mm) when installed in stud cavities. The potential heat of SPRAYTITE® 81206 and WALLTITE® (LWP, Plus and US) spray-applied insulations is 1961 Btu/ft² (22.3 MJ/m²) per inch of thickness. The wall assembly must be as described in Table 4, 5 or 6.

5.0 CONDITIONS OF USE

The BASF Corporation spray-applied insulations described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The spray-applied insulations and the intumescent coatings must be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. The instructions within this report govern if there are any conflicts between the manufacturer's published installation instructions and this report.
- 5.2 The spray-applied insulations must be separated from the interior of the building by an approved thermal barrier, as described in Section 4.3, except where installation is in accordance with Section 4.3.2 or where installation is in an attic or crawl space as described in Section 4.4.
- 5.3 The spray-applied insulations must not exceed the thicknesses noted in Section 3.2, 4.3, 4.4, 4.6 or 4.7, as applicable.
- 5.4 The spray-applied insulations must be protected from the weather during application.
- 5.5 The spray-applied insulations must be applied by professional spray polyurethane foam installers

approved by BASF Corporation or by the Spray Polyurethane Foam Alliance (SPFA) for the installation of spray polyurethane foam insulation.

- 5.6 Installation in fire-resistance-rated construction must be as described in Section 4.6.
- 5.7 Use of the insulation in areas where the probability of termite infestation is "very high" must be in accordance with IBC Section 2603.8 or IRC Section R318.4, as applicable.
- 5.8 Jobsite certification and labeling of the insulation must comply with 2021, 2018 and 2015 IRC Section N1101.10 (2012 IRC Section N1101.14) and 2021, 2018 and 2015 or 2012 IECC Sections C303.1, R303.1 and R401.3 (2009 IECC Sections 303.1 and 401.3).
- 5.9 When used in or on exterior walls of buildings of Type I, II, III and IV construction, the wall assembly must conform to those described in Section 4.7.
- 5.10 When used in unvented attics in accordance with Section 4.4.2 of this report, installation with a vapor diffusion port in accordance with 2021 IBC Section 1202.3, Item 5.2 or 2021 and 2018 IRC Section R806.5, Item 5.2 is outside the scope of this report.
- 5.11 The polyurethane foam plastic insulation components are produced in Houston, Texas; Orange, California and Toronto, Canada under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated April 2020, revised July 2020, including reports of tests in accordance with Appendix X of AC377.
- 6.2 Data in accordance with ASTM E119 (UL 263).
- 6.3 Reports of water vapor transmission tests in accordance with ASTM E96.
- 6.4 Reports of air leakage testing in accordance with ASTM E283.
- 6.5 Reports of fire propagation characteristics tests in accordance with NFPA 285.
- 6.6 Reports of potential heat of foam plastics tests in accordance with NFPA 259.
- 6.7 Reports of room corner tests in accordance with NFPA 286, UL 1715 and ASTM E84.

7.0 IDENTIFICATION

- 7.1 Each container of components A and B of the polyurethane foam plastic insulation bears a label 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 evaluation report number (ESR-2642), the shelf life and the date of manufacture.

The ICP Construction FIRESHELL® F10E coating is identified with the manufacturer's name, the product trade name, use instructions and evaluation report number ([ESR-3997](#)).

The International Fireproof Technology Inc. DC 315 coating is identified with the manufacturer's name, the product trade name, date of manufacture, shelf life or expiration date, manufacturer's instructions for application and evaluation report number ([ESR-3702](#)).

The other Intumescent coatings are identified with the manufacturer’s name, the product trade name and use instructions.

7.2 The report holder’s contact information is the following:

BASF CORPORATION
1703 CROSSPOINT AVENUE
HOUSTON, TEXAS 77054
(888) 900-FOAM
www.spf.basf.com

8.0 OTHER CODES

8.1 Evaluation Scope:

In addition to the codes referenced in Section 1.0, the products in this report were evaluated for compliance with the requirements of the following codes:

- 2006 *International Building Code*® (2006 IBC)
- 2006 *International Residential Code*® (2006 IRC)
- 2006 *International Energy Conservation Code*® (2006 IECC)
- 2003 *International Building Code*® (2003 IBC)
- 2003 *International Residential Code*® (2003 IRC)
- 2003 *International Energy Conservation Code*® (2003 IECC)

8.2 Uses:

The products comply with the above-mentioned codes as described in Sections 2.0 through 7.0 of this report, with the following modifications:

- **Application with a Prescriptive Thermal Barrier:** See Section 4.3.1, except the approved thermal barrier must be installed in accordance with Section R314.4 of the 2006 IRC or Section R314.1.2 of the 2003 IRC, as applicable.
- **Application with a Prescriptive Ignition Barrier:** See Section 4.4.1, except an ignition barrier must be installed in accordance with Section R314.2.3 of the 2003 IRC, or Section R314.5.3 or R314.5.4 of the 2006 IRC.
- **Application without a Prescriptive ignition Barrier:** See Section 4.4.2, except that combustion air is provided in accordance with Sections 701 and 703 of the 2006 IMC.
- **Protection against Termites:** See Section 5.7, except use of the insulation in areas where the probability of termite infestation if “very heavy” must be in accordance with Section 320.4 of the 2003 IRC or Section R320.5 of the 2006 IRC.
- **Jobsite Certification and Labeling:** See Section 5.8, except jobsite certification and labeling must comply with Section 102.5.1 of the 2003 IECC, or Sections 102.1.1 and 102.1.11, as applicable, of the 2006 IECC.

TABLE 1—THERMAL RESISTANCE (R-VALUES)¹

SPRAYTITE® (SP and 158)		SPRAYTITE® (178 and 81206) and WALLTITE® (US +)		SPRAYTITE® (COMFORT, PLUS AND COMFORT XL) AND WALLTITE LWP		SPRAYTITE® LWP-L AND WALLTITE® PLUS	
THICKNESS (INCHES)	R-VALUE (°F.ft².h/Btu) ^{1,2}	THICKNESS (INCHES)	R-VALUE (°F.ft².h/Btu) ^{1,2}	THICKNESS (INCHES)	R-VALUE (°F.ft².h/Btu) ^{1,2}	THICKNESS (INCHES)	R-VALUE (°F.ft².h/Btu) ^{1,2}
1	6.6	1	6.7	1	6.9	1	7.1
2	13	2	13	2	14	2	14
3	20	3	20	3	21	3	21
3.5	24	3.5	24	3.5	25	3.5	25
4	27	4	28	4	29	4	28
5	34	5	34	5	36	5	36
6	41	6	41	6	43	6	43
7	48	7	48	7	50	7	50
8	54	8	55	8	57	8	57
10	68	10	69	10	64	10	64
11	75	11	76	11	71	11	71
12	82	12	83	12	79	12	78

For SI: 1 inch = 25.4 mm; 1 °F.ft².h/Btu = 0.176 110 °K.m²/W.

¹R-values are calculated based on tested K values at 1-and either 3.5- or 4-inch thicknesses.

²R-values greater than 10 are rounded to the nearest whole number.

TABLE 2—USE OF INSULATION WITHOUT A PRESCRIPTIVE THERMAL BARRIER¹

INSULATION TYPE	MAXIMUM THICKNESS (in.) (Wall Cavities)	MAXIMUM THICKNESS (in.) (Ceilings, Underside of Roof Sheathing/Rafters & Floors)	FIRE-PROTECTIVE COATING MINIMUM THICKNESS & TYPE (Applied to all Foam Surfaces) ²	MINIMUM APPLICATION RATE OF FIRE-PROTECTIVE COATING	May be left exposed as an Interior Finish	TESTS SUBMITTED
WALLTITE® (LWP and US) SPRAYTITE® (178 and 81206)	5½	11½	DC315 Prime Coat 4 mils wet & DC315 16 wet mils	0.25 gal / 100 ft ² & 1.00 gal / 100 ft ²	Yes	NFPA 286
	5½	7½	F10E 23 wet mils	1.23 gal / 100 ft ²	Yes	NFPA 286
WALLTITE® (Plus)	5½	7½	DC315 20 wet mils	1.25 gal / 100 ft ²	Yes	NFPA 286
	5½	9½	F10E 21 wet mils	1.16 gal / 100 ft ²	Yes	NFPA 286
SPRAYTITE® (158)	5½	7½	DC315 20 wet mils	1.25 gal / 100 ft ²	Yes	NFPA 286
	5½	9½	F10E 21 wet mils	1.16 gal / 100 ft ²	Yes	NFPA 286
SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L and SP)	5½	7½	DC315 20 wet mils	1.25 gal / 100 ft ²	Yes	NFPA 286
	5½	9½	F10E 21 wet mils	1.16 gal / 100 ft ²	Yes	NFPA 286

For SI: 1 inch = 25.4 mm; 1 mil = 0.0254 mm; 1 gallon = 3.38 L; 1 ft² = 0.093 m²; NA = not applicable.

¹See Section 4.3.2.

²See Section 3.9, 3.10, 3.11 and 3.13.

TABLE 3—USE OF INSULATION IN ATTICS AND CRAWL SPACES WITHOUT A PRESCRIPTIVE IGNITION BARRIER¹

INSULATION TYPE	MAXIMUM THICKNESS (in) (Wall Cavities & Attic Floors)	MAXIMUM THICKNESS (in) (Ceilings, Underside of Roof Sheathing/Rafters & Floors)	FIRE-PROTECTIVE COATING MINIMUM THICKNESS & TYPE (Applied to all Foam Surfaces) ²	MINIMUM APPLICATION RATE OF FIRE-PROTECTIVE COATING	TESTS SUBMITTED (AC377)
WALLTITE® (LWP and US) SPRAYTITE® (178 and 81206)	9¼	11¼	No coating required	NA	Appendix X
	9¼	11¼	Fireshell IB4 10 wet mils	0.60 gal / 100 ft ²	Appendix X
	9¼	11¼	ALDOCOAT 800 18 wet mils	1.12 gal / 100 ft ²	Appendix X
	9¼	11¼	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	UL1715
	5½	11½	DC315 4 wet mils	0.25 gal / 100 ft ²	Appendix X
WALLTITE® (Plus)	7½	11¼	No coating required	NA	Appendix X
	11¼	11¼	Flame Seal TB 24 wet mils	1.60 gal / 100 ft ²	UL1715
	5½	11½	DC315 4 wet mils	0.25 gal / 100 ft ²	Appendix X
	8	8	No Burn Plus XD 6 wet mils	0.31 gal / 100 ft ²	Appendix X
	5½	9½	F10E 21 wet mils	1.16 gal / 100 ft ²	NFPA 286
	11½	11½	FS-IB Ignition Barrier 8 wet mils	0.50 gal / 100 ft ²	Appendix X
SPRAYTITE® (158)	7½	11¼	No coating required	NA	Appendix X
	11¼	11¼	Flame Seal TB 24 wet mils	1.60 gal / 100 ft ²	UL1715
	5½	11½	DC315 4 wet mils	0.25 gal / 100 ft ²	Appendix X
	8	8	No Burn Plus XD 6 wet mils	0.31 gal / 100 ft ²	Appendix X
	5½	9½	F10E 21 wet mils	1.16 gal / 100 ft ²	NFPA 286
	11½	11½	FS-IB Ignition Barrier 8 wet mils	0.50 gal / 100 ft ²	Appendix X
SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, and SP)	7½	11¼	No coating required	NA	Appendix X
	11¼	11¼	Flame Seal TB 24 wet mils	1.60 gal / 100 ft ²	UL1715
	5½	11½	DC315 4 wet mils	0.25 gal / 100 ft ²	Appendix X
	8	8	No Burn Plus XD 6 wet mils	0.31 gal / 100 ft ²	Appendix X
	5½	9½	F10E 21 wet mils	1.16 gal / 100 ft ²	NFPA 286
	11½	11½	FS-IB Ignition Barrier 8 wet mils	0.50 gal / 100 ft ²	Appendix X

For SI: 1 inch = 25.4 mm; 1 mil = 0.0254 mm; 1 gallon = 3.38 L; 1 ft² = 0.093 m²; NA = not applicable.

¹See Section 4.4.2.

²See Section 3.6, 3.7, 3.8, 3.9, 3.10, 3.11, 3.12 and 3.14

TABLE 4—NFPA 285 COMPLYING WALLS—SPF ON EXTERIOR

WALL COMPONENTS	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 on interior, installed over minimum 3 5/8-inch-depth, minimum No. 20-gage steel studs at a maximum of 24 inches on center with lateral bracing every 4 feet vertically
Floorline firestopping	4 pcf mineral-fiber insulation friction-fit in each wall stud cavity at each floor line.
Cavity insulation— Use either 1, 2, or 3	1—None 2—Fiberglass batt insulation ¹ 3—Mineral-fiber insulation ¹
Exterior sheathing— Use either 1, or 2	1—None 2—Minimum 1/2-inch-thick Type X exterior gypsum sheathing
Exterior Insulation	Maximum 3-inch thickness of SPRAYTITE® (Comfort, Comfort XL, 178 and 81206) or WALLTITE® (LWP, Plus, and US)
Exterior wall covering—Use either 1, 2, 3 or 4	1—Brick —Standard type brick veneer anchors installed maximum 24 inches on center, vertically on each stud —Maximum 2-inch air gap between exterior insulation and brick —Standard nominal 4-inch-thick, clay brick 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—Natural stone veneer –Minimum 2-inch-thick using any standard non-open-jointed installation technique, such as ship-lap, etc. 4—Cast artificial stone – minimum 1 1/2–inch-thick, complying with ICC-ES AC51 using any standard non-open-jointed installation technique, such as ship-lap, etc. 5—Terracotta cladding – Use any terracotta cladding system in which the terracotta is minimum 1 1/4 inch. Any standard non-open-jointed installation technique such as ship-lap, etc. can be used.

For **SI**: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pcf = 16.01 kg/m³.

¹Insulation must comply with the applicable requirements of 2021, 2018, 2015 or 2012 IBC Section 720.2 (2009 IBC Section 719.2).

TABLE 5—NFPA 285 COMPLYING WALLS—SPF IN WALL CAVITY

WALL COMPONENTS	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 on interior, installed over minimum 3 5/8-inch-depth minimum No. 20-gage steel stud at a maximum of 24 inches on center with lateral bracing every 4 feet vertically
Floorline firestopping	4 pcf mineral fiber insulation friction-fit in each wall stud cavity at each floor line.
Cavity Insulation— Use either 1, 2, 3 or combination of 1 and 2 or combination of 1 and 3	1—Maximum 3 5/8- inch thickness of SPRAYTITE® (Comfort, Comfort XL, 178 and 81206) or WALLTITE (LWP, Plus and US) applied using exterior gypsum sheathing as the substrate and covering the width of the cavity and the inside the steel stud framing flange. 2—Fiberglass batt insulation (faced or unfaced) on the exterior side of the foam plastic 3—Mineral wool insulation (faced or unfaced) on the exterior side of the foam plastic
Exterior sheathing	5/8-inch-thick Type X exterior gypsum sheathing
Exterior wall covering ¹	1 – Any non-combustible exterior wall covering material using any standard installation technique 2 – Any non-combustible exterior wall covering system with a combustible water-resistive barrier that has successfully been tested in accordance with NFPA 285 Details of the exterior wall covering must be provided to the code official by the report holder, designer or specifier, with an engineering analysis demonstrating that (1) the exterior wall covering conforms to ASTM E136 and (2) the addition of the wall covering and/or water-resistive barrier to the assembly described in this table does not negatively affect conformance of the assembly with the requirements of IBC Section 2603.5.

For **SI**: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pcf = 16.01 kg/m³.

¹Under the 2021 IBC, the non-combustible exterior wall with or without a combustible water-resistive barrier must be tested in accordance with the 2019 edition of NFPA 285.

TABLE 6—NFPA 285 COMPLYING WALLS—SPF ON EXTERIOR WITH OPTIONAL SPF IN WALL CAVITY

WALL COMPONENTS	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 on interior, installed over minimum 3 5/8-inch-depth, minimum No. 25-gage steel studs at a maximum of 24 inches on center
Floorline firestopping	4 pcf mineral-fiber insulation friction-fit in each wall stud cavity at each floor line
Cavity insulation— Use either 1, 2, 3 or 4	1—None 2—Maximum 3 5/8-inch thickness of SPRAYTITE® (Comfort, Comfort XL, 178 and 81206) or WALLTITE® (LWP, Plus and US) applied to Base wall 3 and covering the width of the cavity and the inside the steel stud framing flange 3—Fiberglass batt insulation ¹ 4—Mineral-fiber insulation ¹
Exterior sheathing— Use 1 with Base Wall 1 or 2, Use 2 with Base Wall 3	1—None 2—Minimum 5/8-inch-thick ASTM C1177 exterior sheathing covered with Master Builders Solutions US, LLC’s MasterSeal AWB (ESR-3209) at a maximum nominal thickness of 40 mils wet film thickness
Exterior Insulation— Use 1 with Exterior wall coverings 1, 2, 3, 4 or 5 Use 2 with Exterior wall coverings 1, 2, 3, 4, 5 or 6	1—Maximum 3-inch thickness of SPRAYTITE® (Comfort, Comfort XI178 and 81206) or WALLTITE® (LWP and US) 2—Maximum 3 1/2-inch thickness of SPRAYTITE® (Comfort, Comfort XL 78 and 81206) or WALLTITE® (LWP and US) applied directly to the exterior face of the exterior sheathing of Base wall 3 or directly to the exterior face of Base wall 1 or 2 and covered with ICP Construction Fireshell F10E intumescent coating installed at a minimum 18 mils wet film thickness covered with Fireshell F1 topcoat installed at a minimum 7 mils wet film thickness ²
Exterior wall covering—Use either 1, 2, 3, 4 or 5	1—Brick —Standard type brick veneer anchors installed maximum 24 inches on center, vertically on each stud —Maximum 2-inch air gap between exterior insulation and brick —Standard nominal 4-inch-thick, clay brick 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—Natural stone veneer – Minimum 2-inch-thick, using any standard non-open-jointed installation technique such as ship-lap, etc. 4—Cast artificial stone – Minimum 1 1/2–inch-thick, complying with ICC-ES AC51 using any standard non-open-jointed installation technique such as ship-lap, etc. 5—Terracotta cladding – Use any terracotta cladding system in which the terracotta is minimum 1 1/4 inch. Any standard non-open-jointed installation technique such as ship-lap, etc. can be used 6—Alucobond Plus ACM panels (ESR-1185) and framing system consisting of maximum 4-inch galvanized steel or fiberglass clips/brackets ³ that meet wind load requirements with No. 18-gage, 1-inch-deep galvanized steel subgirts installed directly to the clips/brackets. The clips/brackets and subgirts are fastened through the SPF and sheathing to the steel studs with corrosion-resistant as required to meet design wind loads with the clips spaced a maximum of 24 inches on center horizontally and at a maximum 30 1/4 inches on center vertically at the top, bottom and center of the panels. The Alucobond Plus ACM panels are fastened to the subgirts with minimum 1-inch-long, No.12 stainless steel, self-drilling screw hex washer head screw spaced a maximum of 12 inches on center at horizontal joints and at a minimum at the middle of the panels at vertical joints.
Opening Flashing	Minimum No. 22-gage corrosion-resistant steel flashing installed at all openings to completely cover the opening header, jambs and sill

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pcf = 16.01 kg/m³.

¹Insulation must comply with the applicable requirements of 2021, 2018, 2015 or 2012 IBC Section 720.2 (2009 IBC Section 719.2).

²Coating must be applied in accordance with the coating manufacturer’s published installation instructions.

³Clips/brackets shall be sized so that the maximum air space between the exterior face of the foam and the back of the panels does not exceed 3 1/2 inches.

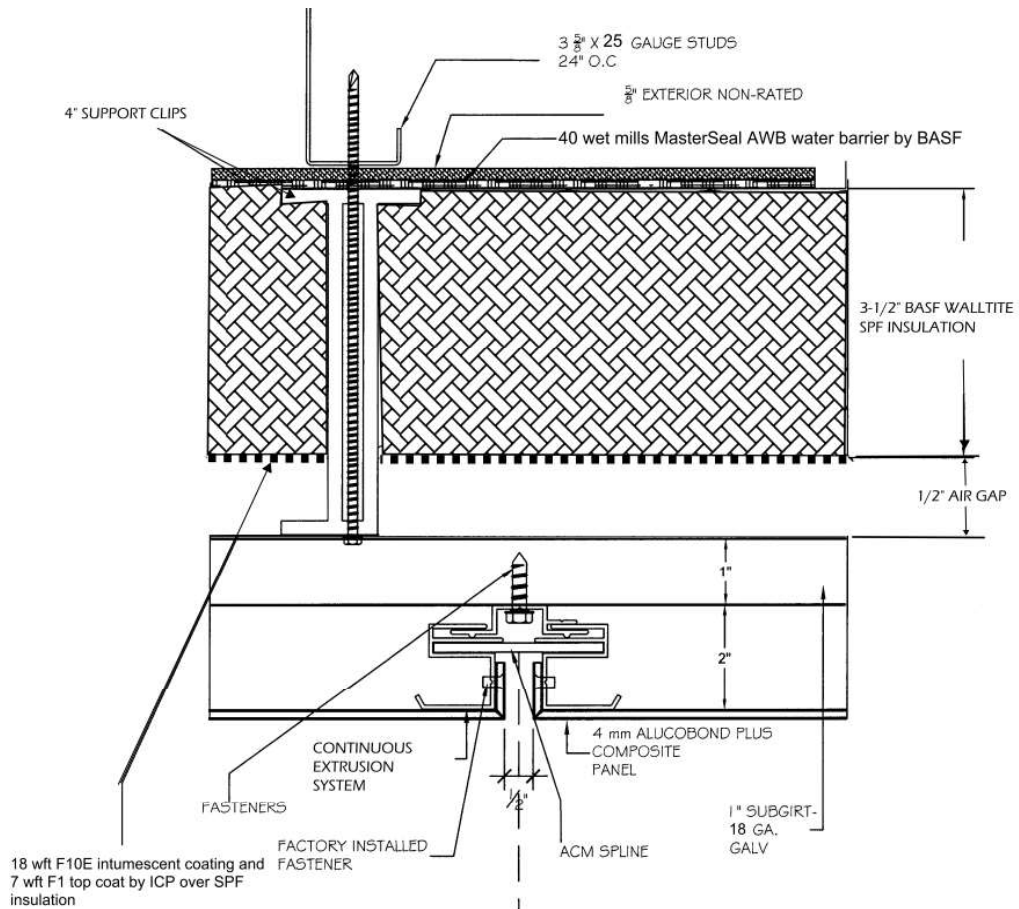


FIGURE 1—VERTICAL JOINT¹

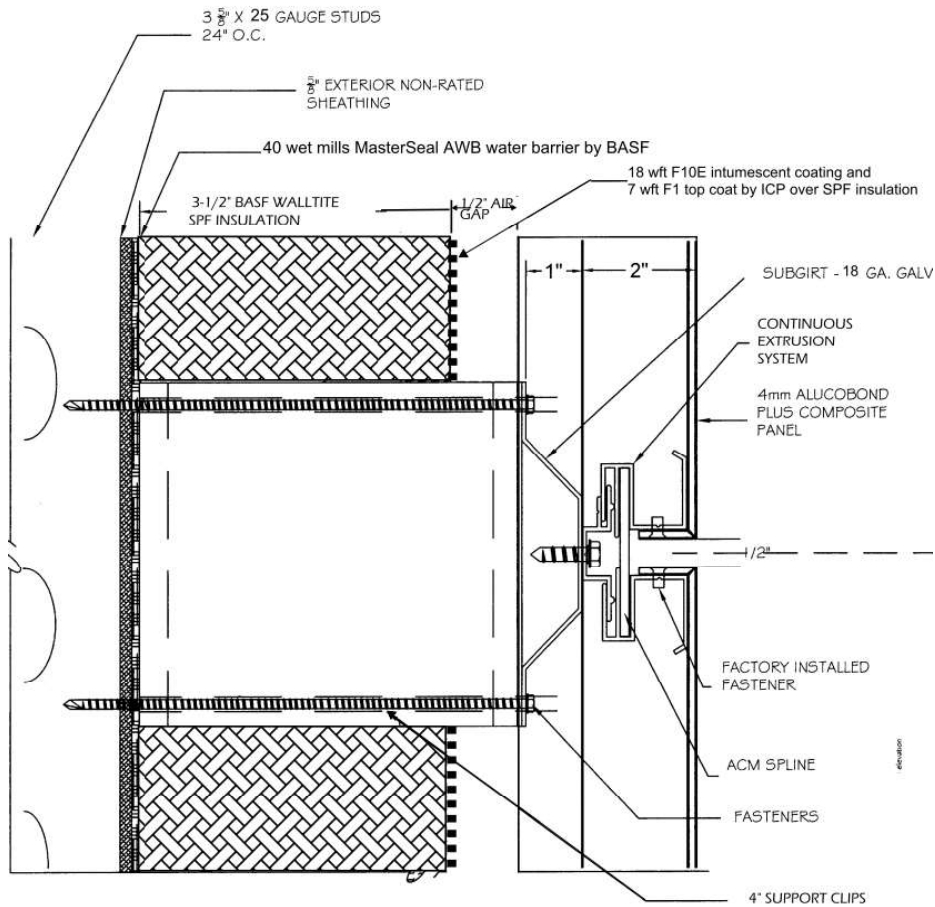


FIGURE 2—HORIZONTAL JOINT¹

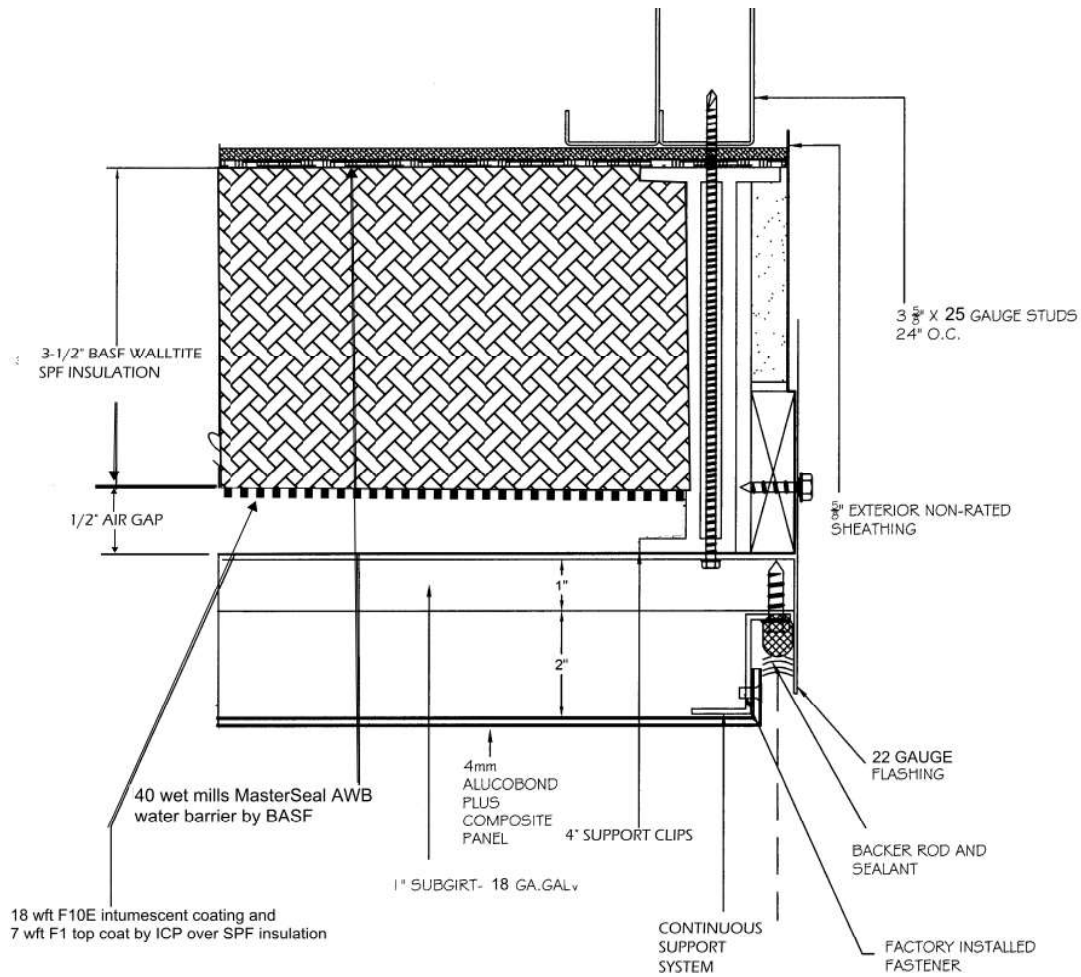


FIGURE 3—WINDOW JAMB WITH FLASHING¹

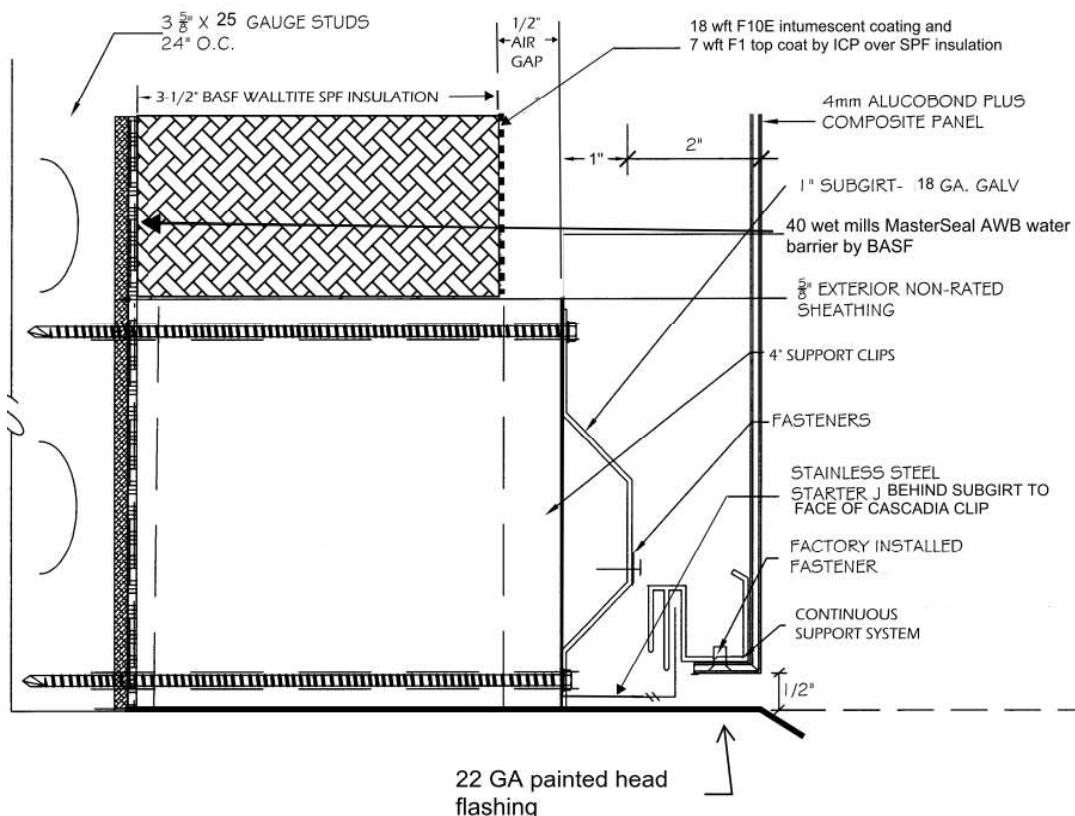


FIGURE 4—WINDOW HEAD WITH FLASHING¹

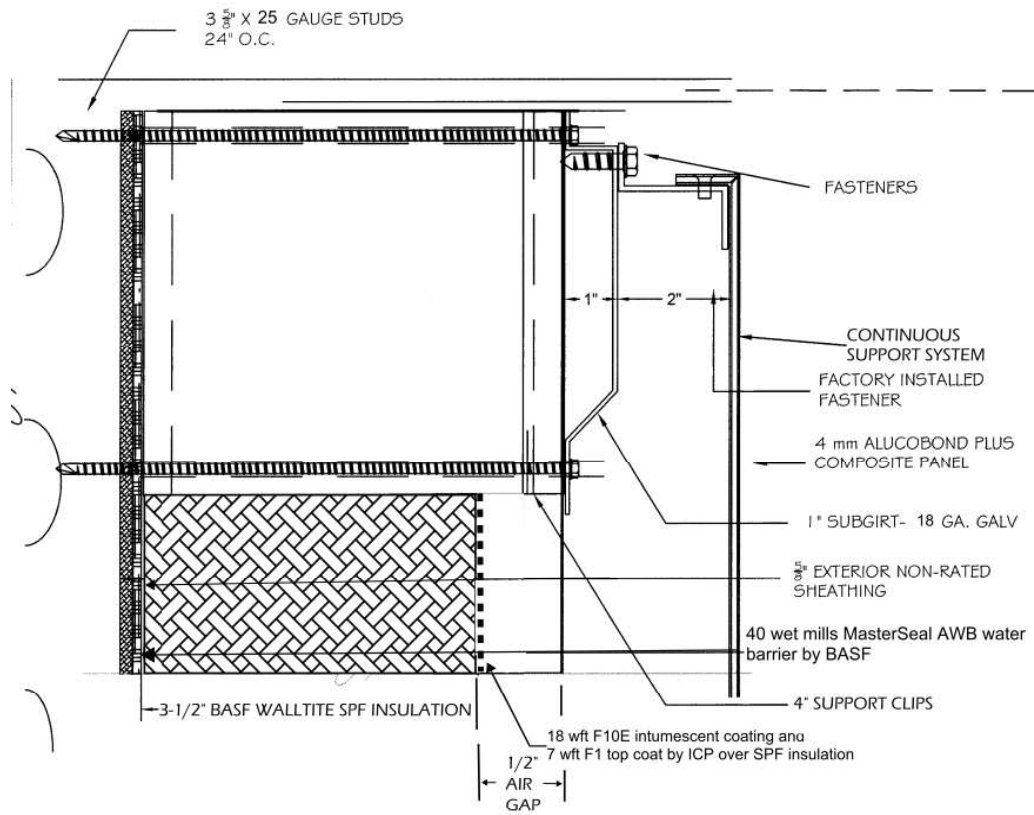


FIGURE 5—WINDOWSILL WITH FLASHING¹

¹See Table 6 for specific details on wall construction. In the event of conflict between the written descriptions in Table 6 and the Figures, the written description applies.

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

EVALUATION SUBJECT:

BASF CORPORATION SPRAY-APPLIED INSULATIONS: SPRAYTITE® (COMFORT, COMFORT PLUS, COMFORT XL AND LWP-L) AND WALLTITE® (LWP AND PLUS)

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the BASF Corporation Spray-Applied Insulations, described in ICC-ES evaluation report ESR-2642, have also been evaluated for the codes noted below.

Applicable code editions:

- 2019 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of the State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code* (CRC)
- 2019 *California Energy Code* (CEC)

2.0 CONCLUSIONS

2.1. CBC and CRC:

The BASF Corporation Spray-Applied Insulations, described in Sections 2.0 through 7.0 of the evaluation report ESR-2642, comply with the 2019 CBC and CRC, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report.

2.1.1. OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2. DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2. CEC:

The BASF Corporation Spray-Applied Insulations, described in Sections 2.0 through 7.0 of the evaluation report ESR-2642, comply with the 2019 CEC, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report.

2.2.1. Conditions of Use:

In accordance with Section 110.8 of the 2019 California Energy Code, verification of certification by the Department of Consumer Affairs, Bureau of Household Goods and Services, must be provided to the code official, demonstrating that the insulation conductive thermal performance is approved pursuant to the California Code of Regulations, Title 24, Part 12, Chapters 12-13, Article 3, "Standards for Insulating Material." Certification can be verified with the DCA Bureau of Household Goods and Services using the following link to the bureau's Directory of Certified Insulation Materials: https://bhgs.dca.ca.gov/consumers/ti_directory.pdf

This supplement expires concurrently with the evaluation report, reissued February 2022 and revised August 2022.

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

EVALUATION SUBJECT:

BASF CORPORATION SPRAY-APPLIED INSULATIONS: SPRAYTITE® (COMFORT, COMFORT PLUS, COMFORT XL, LWP-L, SP, 158, 178 AND 81206) AND WALLTITE® (LWP, PLUS AND US)

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP, 158, 178 and 81206) and WALLTITE® (LWP, PLUS and US) spray-applied polyurethane foam insulations, described in ICC-ES evaluation report ESR-2642, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 Florida Building Code—Building
- 2020 Florida Building Code—Residential

2.0 CONCLUSIONS

The SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP, 158, 178 and 81206) and WALLTITE® (LWP, PLUS, and US) spray-applied polyurethane foam insulations, described in Sections 2.0 through 7.0 of the evaluation report ESR-2642, comply with the *Florida Building Code—Building* and *Florida Building Code—Residential*. The design requirements shall be determined in accordance with the *Florida Building Code—Building* or *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-2642 for the 2018 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or *Florida Building Code—Residential*, as applicable.

Use of the SPRAYTITE® (Comfort, Comfort Plus, Comfort XL, LWP-L, SP, 158, 178 and 81206) and WALLTITE® (LWP, PLUS and US) spray-applied polyurethane foam insulations for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Residential* and *Florida Building Code—Building* has not been evaluated and is outside the scope of this supplemental report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued February 2022 and revised August 2022.

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

EVALUATION SUBJECT:

BASF CORPORATION SPRAY-APPLIED INSULATIONS: SPRAYTITE® (COMFORT, COMFORT PLUS, LWP-L, XL, SP, 158, 178 AND 81206) AND WALLTITE® (LWP, PLUS AND US)

1.0 EVALUATION SCOPE

Conformance to the following requirements:

Seal and Insulate with ENERGY STAR® Program—*Definitions and Testing Requirements for Residential Insulation, Version 1.0*

Properties evaluated:

- Thermal resistance
- Surface-burning characteristics

2.0 PURPOSE OF THIS SUPPLEMENT

This supplement is issued to certify that the SPRAYTITE® and WALLTITE® spray-applied foam plastic insulation products described in Sections 2.0 through 7.0 of the evaluation report (ESR-2642) have been reviewed for compliance with the applicable codes noted in Section 1.0 of the evaluation report and for the requirements set forth in the Seal and Insulate with ENERGY STAR® Program—*Definitions and Testing Requirements for Residential Insulation, Version 1.0*. The insulation products covered by this supplement are defined as "Spray or Pour Foam Insulation."

The requirements for testing laboratory qualifications and product sampling, as well as the specific material and test standards and editions used in this evaluation, are as set forth in the applicable documentation noted in Section 6.0 of the evaluation report.

3.0 DEFINITIONS

The following definitions are from the *Definitions and Testing Requirements for Residential Insulation, Version 1.0*, and are applicable to the subject of this report.

3.1 General Definitions

Insulation: Any material mainly used to slow down heat flow. It may be mineral or organic, fibrous, cellular, or reflective (aluminum foil). It may be in rigid, semi-rigid, flexible, or loose-fill form.

Residential Buildings: Single family homes (attached or unattached), multifamily buildings with 4 units or fewer, or multifamily buildings (condominiums, apartments) with 3 stories or less in height above grade.

3.2 Insulation Product Definition

Spray or Pour Foam Insulation: A thermal insulating material that is sprayed or poured (as a gel or foamy liquid) into place, and expands or sets into a cellular foam and cures at the point of installation through a chemical reaction. Foamed materials include, but are not limited to, polyurethane, polyisocyanurate, phenolic and cementitious insulation.

3.3 Insulation Performance Definitions

R-value: The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area. For the purposes of the Seal and Insulate with ENERGY STAR program, only Imperial units will be accepted [(h·ft²·°F)/Btu].

Smoke-Development Index: The characteristic of a material to emit smoke when exposed to flame or fire compared to red oak and inorganic cement.

Flame-Spread Index: The characteristic of a material to resist the spreading of flames when exposed to flame or fire compared to red oak and inorganic cement.

3.4 Thermal Resistance:

The SPRAYTITE® and WALLTITE® spray-applied foam plastic insulations have thermal resistance R-values as noted in Table 1 of ESR-2642, based upon testing.

3.5 Installation

3.5.1 General: The installation of the SPRAYTITE® and WALLTITE® spray-applied foam plastic insulations must be in accordance with the requirements set forth in Sections 4.0 and 5.0 (as applicable) of ESR-2642. The insulation is manufactured on-site by spray polyurethane foam applicators meeting the qualification requirements stated in Section 5.5 of ESR-2642. The insulation should not be installed in direct contact with chimneys, flues or heat-producing appliances. See Figure 7 for recommended clearances.

3.5.2 Personal Protective Equipment (PPE): The following personal protective equipment (PPE) requirements are reprinted from the website of the American Chemistry Council (ACC) and deal with Spray Polyurethane Foam Health and Safety (<http://www.spraypolyurethane.org/PPE>):

“PPE for SPF High Pressure Interior Application:

When spraying an SPF two-component high pressure spray polyurethane foam system indoors, sprayers and helpers should wear:

- A NIOSH-approved full face or hood-type supplied air respirator (SAR) (as outlined in your company's Respiratory Protection Program)
- MDI-resistant chemical gloves (e.g., nitrile), or fabric gloves coated in nitrile, neoprene, butyl, or PVC
- Chemically resistant long-sleeve coveralls or chemically resistant full body suit with hood
- MDI-resistant fitted boots/booties”

“Protective Clothing:

The use of appropriate protective clothing is necessary whenever there is possibility of direct contact with SPF chemicals. The appropriate protective clothing varies depending upon the potential for exposure. Applicators and helpers typically wear disposable coveralls to keep spray and mist from contacting skin and clothing. To protect skin, wear PPE in such a manner as to protect all skin (in other words, there should be no exposed skin showing). When not wearing a hood respirator, select a coverall with an attached hood or spray head cover. For tasks where there is a potential for splash, consider a suit coated with an impermeable coating such as PVC and MDI-resistant fitted boots/booties.”

“Gloves:

Gloves made of nitrile, neoprene, butyl or PVC generally provide adequate protection against A-side materials. (See Guidance for the Selection of Protective Clothing for MDI Users, Center for the Polyurethane Industry (CPI) Guidance Document AX178). A-side protection is generally considered adequate to provide B-side protection; however, consult the manufacturer's SDS for specific information about B-side protection.”

“Eye and Face Protection:

Appropriate eye protection helps prevent eye contact from splashes of liquid SPF chemicals, accidental sprays of reacting foam, aerosols and vapors that are likely to be present during spraying, and airborne particulate associated with sanding and grinding operations. The type of eye protection needed depends on the nature of the activity.”

Persons handling liquid SPF chemicals in open containers can protect their eyes by wearing safety goggles or safety goggles in combination with face shields. The use of contact lenses is discouraged.

During application of SPF, eye protection may be provided by virtue of wearing a full-face or hood respirator. OSHA requires that an eyewash* or safety shower be provided in the work area where the eyes or body may be exposed to “injurious corrosive materials.” Consult the SDS for all materials to be used on the job in advance to help you understand whether such materials will be present, and if so, how to comply with applicable OSHA requirements.

“Respiratory Protection:

Engineering controls, such as local exhaust ventilation, can be used to control SPF chemical exposures. Administrative controls, such as work schedules and work practices, are used concurrently to minimize exposure. Respirators are needed when air concentrations continue to exceed occupational exposure limits when engineering and administrative controls are implemented. These limits have been set for a number of SPF chemicals and some common chemicals encountered during SPF application.

Air-purifying respirators (APR) and powered air-purifying respirators (PAPR) are generally appropriate for exterior applications and may be used when spraying polyurethane foam in exterior applications. Supplied air respirators (SAR) are typically used in interior applications. Refer to the NIOSH Respirator Decision Logic (2004) for more information regarding respirator selection.”

Ventilation of the work area is required and should be in accordance with *Ventilation Considerations or Spray Polyurethane Foam: Guidance on Ventilation During Installation of Interior Applications of High-Pressure Spray Polyurethane Foam* as published by the Spray Foam Coalition (SFC) of the Center for the Polyurethanes Industry (CPI). The following statement regarding ventilation of the work area is reprinted from the guidance document:

“Work zone mechanical ventilation during and after SPF installation is designed to prevent workers and others in the area from being exposed to SPF chemicals above recommended or permissible levels. Potential health effects from exposure above recommended levels can range from no effects to slight irritation of the eyes, skin or respiratory system to the development of chronic lung or pulmonary disease depending on the individual person and level and duration of overexposure.”

3.5.3 Occupancy Time after Installation: The re-entry or re-occupancy time shall be in accordance with the manufacturer's installation instructions, which are reprinted on pages 4 and 5 of this certification.

3.5.4 Figures: Figures 1 through 6 represent general installations of the SPRAYTITE® and WALLTITE® spray-applied foam plastic insulations in vented and unvented crawl spaces, the interior of below-grade foundation walls, the exterior of above-grade walls, and in vented and unvented attics. Figure 7 depicts minimum clearances to heat-producing objects. These figures are for illustration purposes only and are not to be construed or used as construction documents.

This supplement expires concurrently with the evaluation report, reissued February 2022 and revised August 2022.



The Chemical Company

BASF Re-Occupancy Times for Interior Building Spray Applications

Jim Andersen, Marketing Applications Specialist SR 021514

Introduction

The application of spray foam insulation is done through special high pressure spray application equipment, Low pressure application units or single component foams. This document will discuss two part foams field process using high pressure application equipment. When the combination of liquid part A compound and liquid B compound is done to produce either closed cell or open cell spray foam insulation there are potential health hazards during the application. OSHA and other government agencies have established protection requirements for all workers that can be exposed to the chemicals during the spray application. Only trained and properly protected workers are allowed in the spray application areas during the spraying and for a period after the spraying has stopped.

Requirements

The spray area should be posted with keep out WARNING signs before and after spraying. Workers only that are trained and have the necessary personal protection equipment are allowed inside the spray area. All others must be kept out as well as pets. Ventilation of the spray area is to be done incorporating the guidance documents: "Ventilation Guidance for Spray Polyurethane Foam Application," published by the U.S. Environmental Protection Agency (EPA), online at <https://www.epa.gov/saferchoice/ventilation-guidance-spray-polyurethane-foam-application> and "Good Practices – Engineering Controls and Ventilation," published by the American Chemistry Council's Center for the Polyurethanes Industry, available online at: www.spraypolyurethane.org/GoodPractices#EngineeringControls

The following general requirements must also be followed, Code of Federal Regulations Title 29 CFR §1926.20 Safety and Health Regulations for Construction: General Safety and Health Provisions available online at www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10606

The applicators and building owners should visit www.spraypolyurethane.org and also www.spf.basf.com for up to date information about spray polyurethane foam construction applications before starting projects.

Industry Established Re Occupancy Times

The Spray Foam Industry and government agencies have worked together to establish general guidelines for re occupancy. These can be found at www.spraypolyurethane.org. The general statement of 24 hours for re occupancy times for interior building applications is the general rule BASF suggests for two part high pressure spray.

"Evaluation reports for many types of building products, including SPF insulation, often include the suggested reoccupancy time, which is variable: for an interior application using two-component high-pressure SPF, some manufacturers recommend 24 hours before reoccupancy, and for an interior two-component, low-pressure SPF kit application, some manufacturers recommend a one hour reoccupancy time. Consult the product manufacturer to determine the recommended reoccupancy time for the particular job and SPF in use.

Note: "Exterior applications where the spray application is done to a roof top application or exterior walls and where there is wide open air spaces; the risk control is done by closing off all air intake areas to a building interior, (windows, doors, warning signs and HVAC intake vents). Roof or exterior applications will generally have plenty of ventilation with natural wind as well as massive volumes of space to dissipate the concentration of materials. Therefore the controls used for interior applications are not generally required, such as added ventilation. The elastomeric roof coatings vary in risks and must be assessed and the risks evaluated on a job by job and material specific basis by the spray foam applicator company.

BASF Re occupancy Research

BASF, Air Products and Honeywell have conducted proprietary studies for indoor air quality measurements on spray foam applications to retrofit attics. Robert, William, James Andersen, Richard Wood, and Mary Bogdan. "Ventilation and Re-Occupancy of a Residential Home Sprayed with High Pressure Polyurethane Foam." Presented at the CPI Technical Conference, September 2012.

This study of three houses where the attic was sealed and ventilated during the spray application has resulted in no chemicals detected within the house at levels greater than those currently assigned levels by government agencies and private chemical manufactures' Material Safety Data Sheets (MSDS) or Safety Data Sheets (SDS).

This particular application process indicates 2 hours after spraying has stopped and ventilation continued that re-occupancy can occur within the homes. The spray foam was done above the sheetrock in non inhabited attic spaces.

BASF continues field monitoring testing as well as supports continued research being done by the American Chemistry Council/Center for the Polyurethane Industries of which we are an active member.

Summary

This information has been provided for use by our spray foam applicators and distributors use. It may also be used to inform end customers who have contracted to have spray foam produced by spray foam applicators to their buildings. It is offered in good faith and believed to present the risks and best industry practices to manage them. Since each field application is different the responsibility rests with spray foam applicators to assess the job risks and control them per the OSHA and others requirements. Technical Questions can be directed to BASF Technical Services 800-706-0712.

Conditioned Crawl Space Detail

BASF Spray Foam application to the inside of a conditioned crawl space.

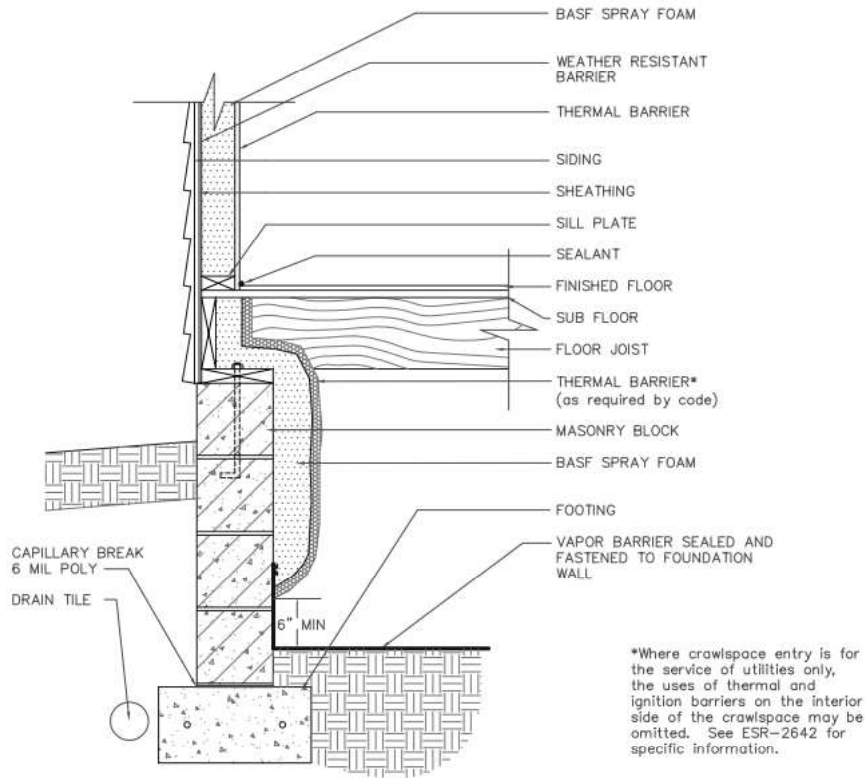


FIGURE 1

Non-Conditioned Crawl Space Detail

BASF Spray Foam application in a non-conditioned crawl space.

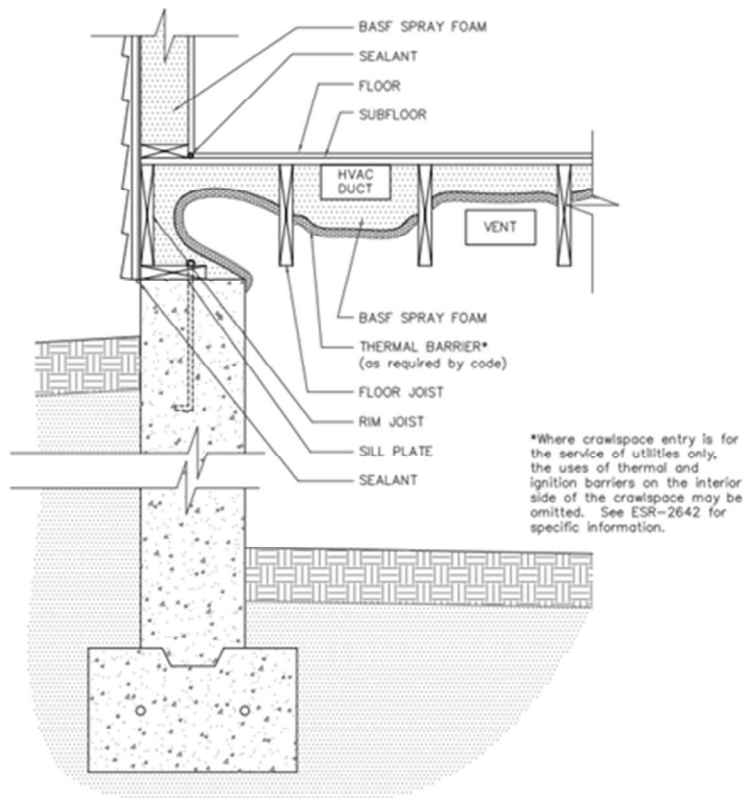


FIGURE 2

Finished Basement Detail

BASF Spray Foam applied in the band/rim joist area and walls of a finished basement

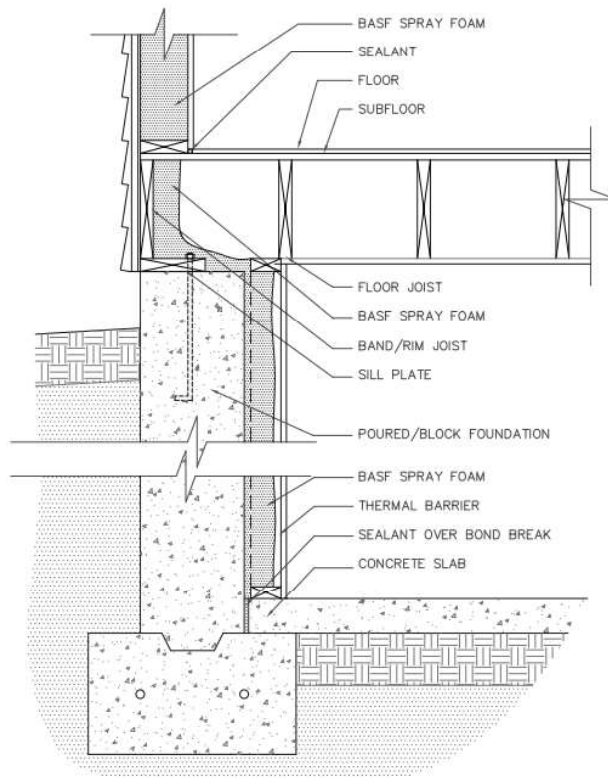
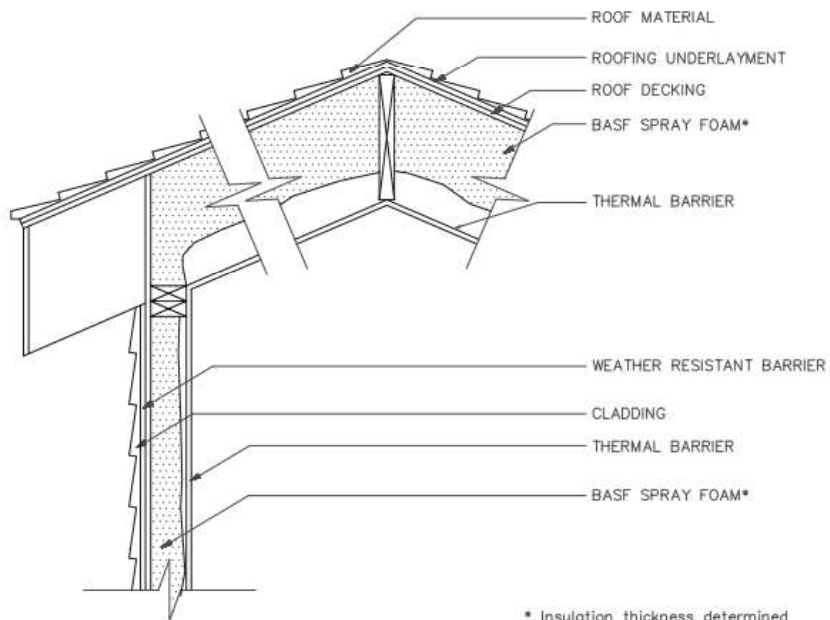


FIGURE 3

Cathedral Ceiling Detail

A cathedral ceiling insulated with BASF Spray Foam.



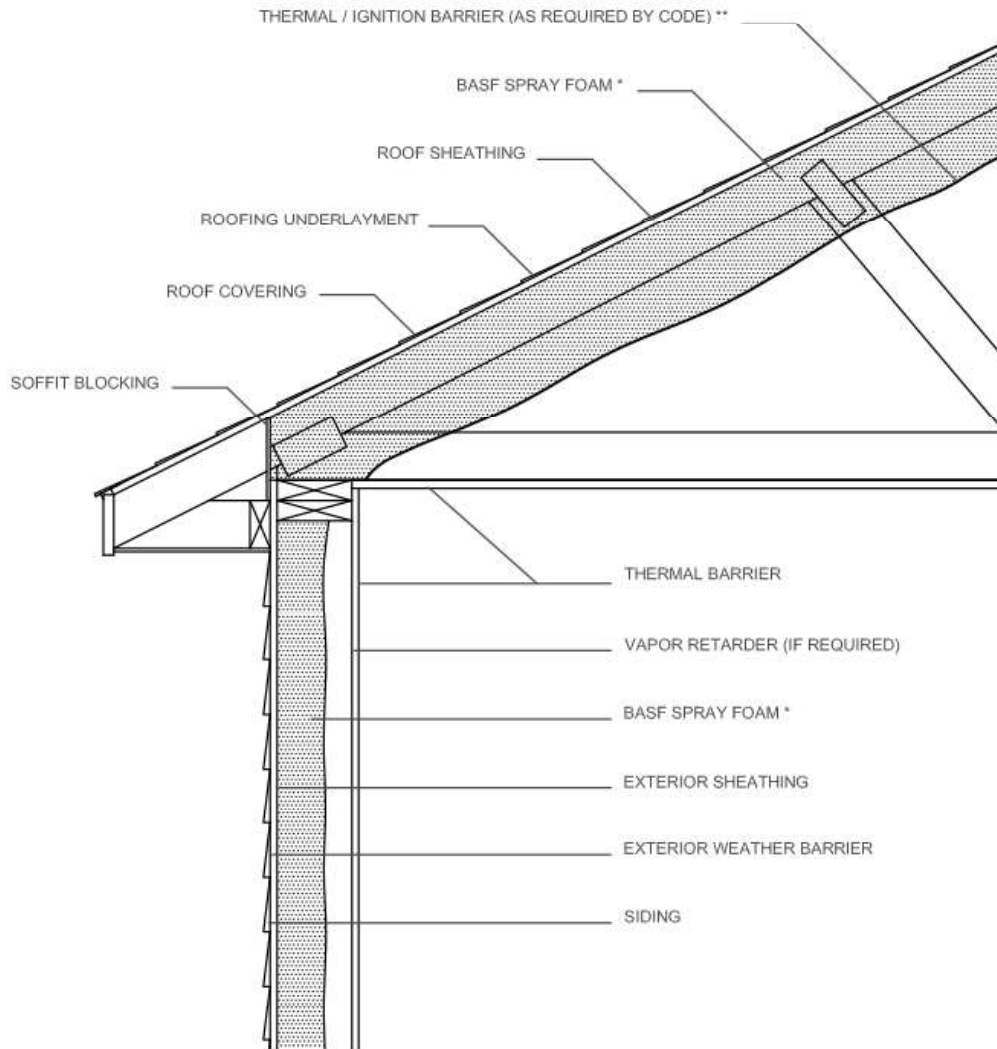
* Insulation thickness determined by IECC requirements and climate zone.

** Unvented roof assemblies shall comply with the requirements found in the IRC section R806.4

FIGURE 4

Unvented Attic Detail

An unvented attic insulated with BASF Spray Foam



*BASF Spray Foam can be used alone, or in combination with other insulation materials. For optimum results, the thickness shall be determined by the insulation requirements of the energy code, and/or the climate zone based upon IRC Section 806.4.

** Consult ESR-2642 for specific information pertaining to alternatives to prescriptive code requirements.

FIGURE 5

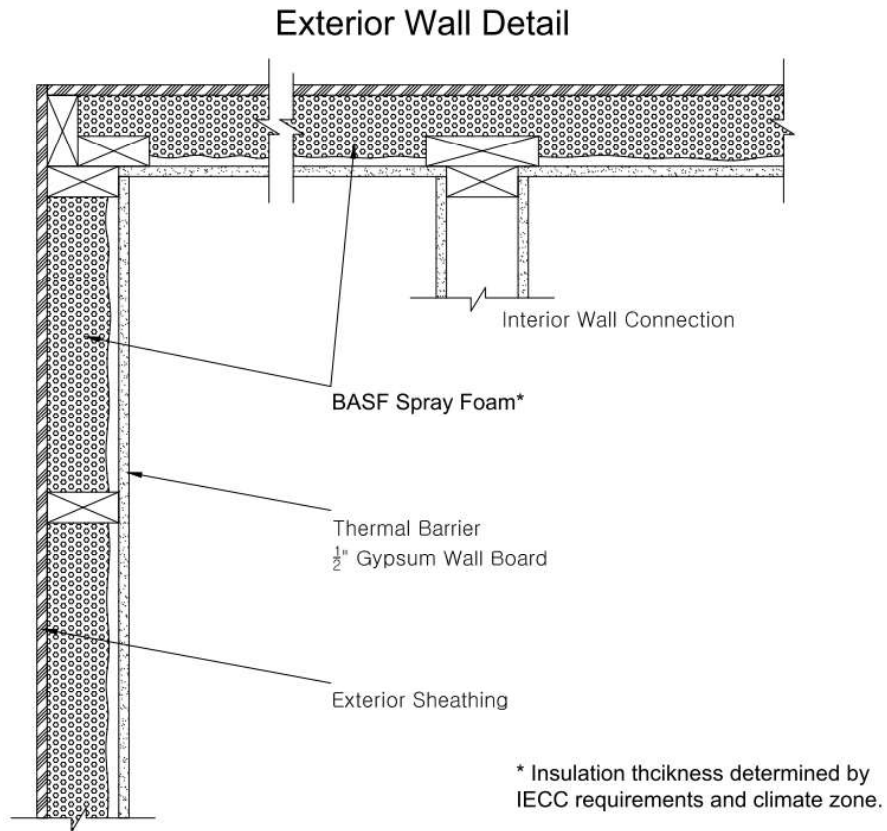


FIGURE 6

Recessed Fixture Detail

The use of a recessed light fixture in conjunction with BASF Spray Foam

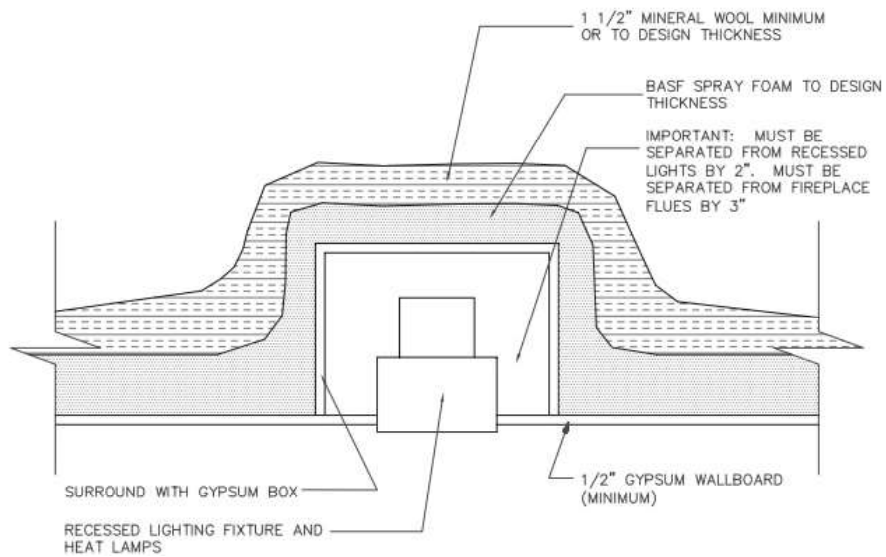


FIGURE 7