TOWN OF GLASTONBURY

GL-2022-16
CODE IMPROVEMENTS RIVERFRONT BOATHOUSE
ADDENDUM NO. 2
12-14-2021

Bid Due Date: 12-16-2021 @ 11:00 A.M.

The attention of bidders submitting proposals for the above-referenced project is called to the following Addendum to the specifications. The items set forth herein, whether of omission, addition, substitution or other change, are all to be included in and form a part of the proposed Contract Documents for the work. Bidders shall acknowledge this Addendum on the Bid Form (Attachment 1).

Question 1: ***If there are any existing mechanicals, such as conduits, pipes, water lines, refrigerant lines etc. fastened to the underside of the deck that is to be fire proofed, do those mechanicals need to be removed and by who? or can the fire proofer just spray everything and encase it?***

Answer: Drawings indicate the general location of recessed in-floor electrical outlet boxes in the floor above that must be properly fire-proofed, as part of the ceiling/floor assembly. Any other mechanicals, conduits, pipes, water lines, refrigerant lines etc. (including some shown on the drawings) are existing to remain in place. Only sprinkler piping is to be removed and replaced per Fire Protection drawings.

Question 2: ***Are you requiring anchor bolts with metal plates for the racks?***

Answer: Boat storage racks must be reinstalled as required per manufacturer. Please refer to Addendum No. 1 for the assumed configuration of anchor methods and materials.

Question 3: ***What is the spec for the existing spray insulation that needs to be removed?***

Answer: See attached for open cell spray foam insultation submittal from original construction project.

Question 4: ***Do we have any information on the spec of the existing ceiling material? I believe it is USG 3270 tile but want to confirm.***

Answer: Answered in Addendum No. 1.

Question 5: ***Is the existing ceiling an aluminum capped grid or just standard steel.***

Answer: Answered in Addendum No. 1.

Question 6: ***Who is responsible for the fire watch during the contractors non-working hours as the sprinkler will be down for an extended period of time.***

Answer: Contractor's Bid shall include 40 hours fire watch. Hours in excess of 40 to be paid by the Town.

Question 7: ***If coordination of events being held interferes with the course of construction, will time extensions be given?***

Answer: Coordination between construction activities and Town events will be addressed on a weekly basis (as the Town updates the schedule of events each week). The Town has limited time frame to complete this project and will make reasonable efforts to assist in coordinating Contractor work around Town events, in conjunction with the fire watch amount indicated above.

Question 8: ***Will the Contractor be allowed to block all access to all areas within scope for non-construction personnel?***

Answer: Yes, only limited to the boat storage room, north entry vestibule and the sprinkler service room, as well as site area immediately to the south of the 3 southerly bay doors (to be reviewed in advance of construction activities, as indicated in Addendum No. 1).

Question 9: ***Will power for the construction process be provided Town?***

Answer: Per Bid Documents, yes.

Question 10: ***Will water for the construction process be provided by the Town?***

Answer: Per Bid Documents, yes.

Question 11: ***Is the contractor responsible for temp lighting during construction?***

Answer: Per Bid Documents, yes. Power for temp lighting is provided by Owner on available circuits & voltage.

Question 12: ***According to plans and specs it shows that there are 2x4 ceiling tiles, however existing conditions are 2x2 tiles. The base bid shows to re-use the existing tiles which will not be possible if a 2x4 pattern is desired, which pattern is desired for final product?***

Answer: Ceiling tiles shall be 2' x 2' tiles and grid (existing to be reinstalled per Base Bid). New ceiling tiles and grid as part of Alternate No. 1 shall be 2' x 2'.

Question 13: ***According to Details 1,2,3,5 on drawing A-501 we are to use 1" Z- channel for attachment points. Due to the thickness requirements of the spray fire proofing, a 2.5" Z-channel will be needed. Are we to carry the cost of larger Z-channel to accommodate the thickness of the fire proofing?***

Answer: Include the larger 2.5" Z-channel where required.

Question 14: ***Note 2.3 on print A-002 states "IF A WALL OR SURFACE IS WORKED ON, THAT WALL OR SURFACE SHALL BE REPAIRED WITH A COMPLETE FINISH, TO THE NEAREST CORNER, CHANGE OF PLANE, OR OTHER JUNCTURE. PROVIDE A SMOOTH AND CLEAN TRANSITION FROM THE NEW FINISHED***

SURFACE TO THE SURROUNDING EXISTING SURFACES, THE INTENT IS TO ELIMINATE THE APPEARANCE OF A REPAIRED CONDITION." If paint does not match due to time, previous blemishes or shade differences, will the contractor be responsible for painting all walls? Should there be an allowance for patching and painting blemishes that need to be addressed?

Answer: Include new paint for the entire east wall of the Boat Storage Room. Other locations will be reviewed by Owner and Architect after paint submittal is reviewed.

Question 15: ***As per plans and specs, vertical beams inside the wall adjoining the workout room are to be to be opened from 1 side to spray with fire proofing. This approach leaves the possibility that 1 side of the vertical beam might be inaccessible. Will the contractor be responsible for removing the mirrors, opening the wall, refinishing, and reinstalling mirrors to get to the "back side" of the beams in the workout room?***

Answer: Yes, Contractor will be responsible for accessing the back side of the beam in the adjacent Workout Room. See below for clarification regarding the mirrors.

Question 16: ***What is the estimated value or budget of this project?***

Answer: The Town does not release budget estimates at this point in the process.

Question 17: ***Will a bid due date extension be considered?***

Answer: Bid due date remains as indicated on Bid Documents.

Question 18: ***UL D832 does not appear to allow for expanded polystyrene insulation (EPI) to be applied to the Blaze-Shield fireproofing product. Please note that Item 10C on the UL design is in reference to insulation applied above the roof deck and not below it in contact with the fireproofing. The Blaze-Shield manufacturer confirmed that this is not an acceptable as the EPI causes separation issues with the Blaze-Shield to the metal and the EPI does not have a fire-rating.***

Answer: Contractor shall include the fire-proofing and thermal insulation assembly indicated on the drawings. This matter will be reviewed with the selected Contractor, manufacturer's representatives, the design team and the Authorities Having Jurisdiction during the building permit application review process.

Question 19: ***Please confirm the design criteria for this project. Notes on drawing FP 0.00 state ordinary hazard 2, however the density .30 and area of application of 2000sqft are not consistent with this occupancy classification. Since the area to be protected is classified as a storage occupancy please provide a commodity classification for the intended storage use, a maximum height of storage, and if the storage is classified as low-piled storage.***

Answer: The storage bays shall be protected in accordance with Section 17.2.1.4(5) of NFPA 13, 2013 Edition. Design criteria shall be 0.3 gpm/sf over 2,000 sqft as shown on the construction documents.

Question 20: ***Please confirm the requirement of in-rack sprinklers, the number of in-rack sprinklers to be calculated along with their required pressure or flow. Also confirm if any reduction in ceiling density is allowed by the installation of the in-rack sprinklers***

Answer: The storage bays shall be protected in accordance with Section 17.2.1.4(5) of NFPA 13, 2013 Edition. In-rack sprinklers were requested by Fire Marshal, in-rack sprinklers shall be provided and spaced 10 feet apart. The water demand for the in-rack sprinklers shall be based on the simultaneous operation of the 8 most hydraulically remote sprinklers. In-rack sprinklers shall discharge at 15 psi minimum. No reduction in ceiling density is permitted by the installation of in-rack sprinklers.

Question 21: ***Please describe the reason for the boat racks needing to be modified, and any possible solutions, so we can determine the cost involved.***

Answer: See Fire Protection drawings and boat rack information provided in Addendum No. 1. This solution has been reviewed by the design engineer and the Fire Marshal, and is considered the preferred approach.

Question 22: ***Fire protection drawing FP1.00 shows a 6" main in the sprinkler room with and 8" line tying into it but drawing FP5.00 shows a 4" line in the sprinkler room tying into the 8" line. The existing system has a 6" main coming through the slab and immediately going down to a 4". Which detail is correct?***

Answer: The 8" connection is correct. The 6" main service coming through the slab is existing to remain. The 4" piping from the service entrance to the base of the riser is existing to remain. The existing 3" dry valve shall be removed and replaced with a new 4" dry valve with all necessary components. Piping from the outlet of the new 4" dry valve shall transition to 8" as soon as possible and continue as shown on the construction documents.

Question 23: ***Modifications to the existing boat rack are still unclear. Please clarify which components are being installed from the product data under this contract.***

Answer: Modifications are required as necessary to install the sprinkler system indicated on the Fire Protection drawings. This includes permanent removal of the top rack/row/arm of each boat storage rack assembly.

Clarification 1: ***Regarding the question and response to Question # 9 of Addendum No. 1, it appears there was a typo in the transposing of the question. The following clarification is offered (in response to and in addition to the question):***

"The Town of Glastonbury will remove all boats, oars and loose equipment from the Boat Storage Room, and the mirrors from the Workout Room, as required for the Contractor to complete their work on the project, in advance of the commencement of the project. The Contractor is responsible for removing and reinstalling the fixed boat storage racks and workbench, as well as any other items, assemblies, etc. indicated on the drawings"

ATTACHMENTS: open cell spray foam insultation submittal from original construction project

Note: This addendum consists of 14 pages text including the above text.

END OF TEXT

NORTHEAST
COLLABORATIVE
ARCHITECTS

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tel: 860.344.9332
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SUBMITTAL REVIEW COVER SHEET
GLASTONBURY RVIERFRONT PARK
BOATHOUSE

CONSTRUCTION MANAGER:	O&G Industries 112 Wall St Torrington, CT 06790
GENERAL CONTRACTOR:	Sarazin General Contractors 6 Commerce Drive North Windham, CT 06256
SPECIFICATION SECTION:	072100-2.4A
ITEM:	Open Cell Spray Foam Insulation

NORTHEAST COLLABORATIVE ARCHITECTS, LLC

SHOP DRAWING REVIEW is only for general compliance with the Contract Documents.

CONTRACTOR IS RESPONSIBLE FOR:

- Correctness of quantities and dimensions.
- Coordination of his work with other trades and existing conditions of this project.
- Means and methods of construction.

X	NO EXCEPTIONS TAKEN	____	CORRECT AS NOTED
_____	REVISE & RESUBMIT	_____	REJECTED

JOB # **10160**

BY: SSD DATE: 3/5/2014

Comments:

BASF
The Chemical Company

Technical Product Data

ENERTITE® NM
LOW-DENSITY, OPEN-CELL INSULATION

enertite® Open-Cell Spray Polyurethane Foam Insulation

Seal and Insulate with ENERGY STAR

DESCRIPTION:

ENERTITE NM is a two-component low-density open-cell spray polyurethane foam system designed for use in building insulation system applications. **ENERTITE NM** is compatible with most common construction materials, but can only be processed with ELASTOSPRAY® 8000A Isocyanate. The benefits of **ENERTITE NM** include:

- Superior insulation
- Non-fibrous
- Sound control

TYPICAL PROPERTIES(1):

PROPERTY	METHOD	ENERTITE NM
Resin:		
Specific Gravity @ 70°F	ASTM D 1638	1.135
Viscosity @ 77°F (cps)	Brookfield	350
Cured Foam:		
Density, core (pcf @ 4" lifts)	ASTM D 1622	0.6 (nominal)
Open Cell Content (%)	ASTM D 6226	>90
Thermal Resistance (aged)		
R-value (ft^2 hr °F/Btu in)(2)	ASTM C518	3.9 / in @ 1-in thick 3.7 / in @ 4-in thick
Response to Thermal and Humid Aging (% linear change)		
158°F / 97% RH / 168 hrs	ASTM D 2126	< -2.0
Water Absorption (vol %)	ASTM D 2842	> 40%
Tensile Strength	ASTM D 1623	5.9 psi
Water Vapor Transmission – 3.5-in foam thickness		
Permeability (Perm-inch)	ASTM E 96	59 (Calculated)
Permeance (Perm)	ASTM E 96	16.9
Surface Burning Characteristics		
Flame Spread Index(3)	ASTM E 84	≤ 25
Smoke Developed Index	ASTM E 84	≤ 450

ADDITIONAL TESTING, APPROVALS & CERTIFICATIONS:

- ASTM E 84 (Class I) with Product Listing (3) (4)
- NFPA 286 (with prescriptive thermal barrier) per IBC Section 803(4)
  - Walls - 11.25-in SPF
  - Ceilings - 16-in SPF
- ATTIC and CRAWL SPACE assemblies (ICC-ES AC377, Appendix X)
  - Assemblies with Intumescent Coatings
    Walls - 11.25-in SPF
    Ceilings - 16-in SPF
- CRITICAL RADIANT FLUX (attic insulation)

PROPERTY	METHOD	ENERTITE NM
Critical Radiant Flux, 4-in foam thickness	ASTM E970	0.26 W/cm²
Critical Radiant Flux, 6-in foam thickness	ASTM E970	0.25 W/cm²

- AIR LEAKAGE

PROPERTY	METHOD	ENERTITE NM
Air Leakage, 3.5-in foam thickness ($L/s*m^2$ @ 75 Pa ΔP)	ASTM E 283	<0.02 L/s-m²

ADDITIONAL INFORMATION:

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

Caution-Failure to follow the application precautions, material safety data sheet information as well as accepted industry practices (www.spraypolyurethane.org) may result in unwanted foam physical properties and applications that may not provide the desired results. This also includes unwanted health risks such as possible respiratory issues, sensitization or eye irritations such as blue haze for applicators and workers located in the area being sprayed. A full understanding of the foam processing and all safety risks must be completed before spraying. Call our BASF spray foam team if you have questions 800-706-0712.

Please contact your local Sales or Technical Representative for specific questions regarding **ENERTITE NM** 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 the following equipment configuration:

- *GRACO® Reactor® E-30 proportioner set at 1:1 volume ratio with 50 ft. of heated delivery hose*
- *GRACO® Fusion® Air Purge spray-gun configured with an AR4242 mix chamber*
- *Process temperature settings: Isocyanate 130-135°F; Resin 130-135°F; Hose 130°F*
- *Process pressure: 1000 psig minimum while spraying*

(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.

(5) The Air Leakage result was below the reportable limit of measurement for the equipment.

(6) Assembly tested: 0.5-inch oriented strand board (OSB) sheathing, 2x4 wood studs, stud cavity fully filled with ENERTITE NM, 0.5-inch Gypsum wallboard finish

BASF Corporation
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Revision Date: April 23, 2012

Polyurethane Solutions

GENERAL INFORMATION:

ENERTITE NM 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.

CAUTIONS AND RECOMMENDATIONS:

ENERTITE NM is designed for an application rate of ½ inch minimum to 6 inches maximum per pass. 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-3102 for additional information. This application procedure is in compliance with the Spray Polyurethane Foam Alliance (SPFA).

ENERTITE NM 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. ENERTITE NM should NOT be installed in these types of constructions unless the structure was designed by a design professional for specific use as cold storage.

ENERTITE NM is designed for installation in most standard construction configurations using common materials such as wood and wood products, metal and concrete. ENERTITE NM has performed successfully when sprayed onto wood substrates down to 40°F. For other substrates, please consult your BASF sales or technical service representative for specific recommendations.

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.

In addition to reading and understanding the MSDS, 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 the following documents published by Spray Polyurethane Foam Alliance (SPFA):

AX-171 *Course 101-R Chapter 1: Health, Safety and Environmental Aspects of Spray Polyurethane Foam and Coverings* **www.spraypolyurethane.org**

Also, the following document is available from the Center for the Polyurethanes Industries (CPI):

Model Respiratory Protection Program for Compliance with the Occupational Safety and Health Administration's Respiratory Protection Program Standard 29 C.F.R. §1910.134

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 any trash receptacle.

All areas that are sprayed incorrectly or result in A only material, B only material, improperly mixed or off ratio materials, too thick of an application or two quick of a thickness build up, are to be removed and replaced with properly processed spray foam. All cleaning solvents and others materials are to be captured and properly disposed of and not left at the job site.

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 ENERTITE NM or any polyurethane foam.

SHELF LIFE AND STORAGE CONDITIONS:

ENERTITE NM has a shelf life of approximately (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.

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

ICC EVALUATION SERVICE

Most Widely Accepted and Trusted

ICC-ES Evaluation Report

ESR-3102*

Reissued July 1, 2013

This report is subject to renewal August 1, 2015.

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

BASF CORPORATION
1703 CROSSPOINT AVENUE
HOUSTON, TEXAS 77054
(713) 383-4554
www.spf.basf.com

EVALUATION SUBJECT:

ENERTITE® US AND ENERTITE® NM OPEN-CELL SPRAY POLYURETHANE FOAM INSULATIONS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2012 and 2009 *International Building Code®* (IBC)
- 2012 and 2009 *International Residential Code®* (IRC)
- 2012 and 2009 *International Energy Conservation Code®* (IECC)
- Other Codes (see Section 8.0)

Properties evaluated:

- Surface-burning characteristics
- Physical properties
- Thermal resistance (*R*-values)
- Attic and crawl space installation
- Air permeability

2.0 USES

ENERTITE® US and ENERTITE® NM are used as a nonstructural thermal insulating material in buildings of Type V construction (IBC) and dwellings under the IRC. Under the IRC, the insulation may be used as air-impermeable insulation when installed in accordance with Section 3.4. The insulation is for use in wall cavities and floor/ceiling assemblies, and in attic and crawl space installations as described in Section 4.4.

3.0 DESCRIPTION

3.1 General:

ENERTITE® US and ENERTITE® NM are two-component, low-density, open-cell, water-blown polyurethane foam plastic insulation systems. The installed nominal density of ENERTITE® US is 0.5 pcf. The installed nominal density of ENERTITE® NM is 0.67 pcf. The two components of the insulation are polymeric isocyanate (A-component) and a resin (B-component) which when stored in unopened containers at a temperature between 50°F and 80°F (10°C and 26.7°C), have a shelf life of nine months and twelve months, respectively.

3.2 Surface Burning Characteristics:

3.2.1 ENERTITE® US: When tested in accordance with ASTM E84, at a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pcf, ENERTITE® US has a flame-spread index of 25 or less and a smoke-developed index of 450 or less. Thicknesses of up to 12 inches (305 mm) for wall cavities and 16 inches (406 mm) for ceiling cavities are recognized, based on room corner fire testing in accordance with NFPA 286, when the insulation is covered with minimum $^1/_2$-inch-thick (12.7 mm) gypsum board or an equivalent thermal barrier complying with the applicable code.

3.2.2 ENERTITE® NM: When tested in accordance with ASTM E84, at a maximum thickness of 4.2 inches (106.7 mm) and a nominal density of 0.8 pcf, ENERTITE® NM has a flame-spread index of 25 or less and a smoke-developed index of 450 or less. Thicknesses of up to $11^1/_4$ inches (286 mm) for wall cavities and 16 inches (406 mm) for ceiling cavities are recognized based on room corner fire testing in accordance with NFPA 286, when the insulation is covered with minimum $^1/_2$-inch-thick (12.7 mm) gypsum board or an equivalent thermal barrier complying with the applicable code.

3.3 Thermal Resistance:

ENERTITE® US and ENERTITE® NM have thermal resistance (*R*-values) at a mean temperature of 75°F (24°C) as shown in Table 1.

3.4 Air Permeability:

ENERTITE® US and ENERTITE® NM spray-applied polyurethane foam insulations, at a minimum thickness of 3.5 inches (89 mm), are considered air-impermeable insulations in accordance with 2012 IRC Section R806.5 and 2009 IRC Section R806.4, based on testing in accordance with ASTM E283 and ASTM E2178.

3.5 Intumescent Coatings:

3.5.1 No-Burn® Plus: No-Burn® Plus intumescent coating is a latex-based coating manufactured by No-Burn, Inc., and is supplied in 1-gallon (4 L) and 5-gallon (19 L) pails and 55-gallon (208 L) drums. The coating material has a shelf life of 12 months when stored in factory-sealed containers at temperatures between 40°F (4.4°C) and 90°F (32.2°C).

3.5.2 No-Burn® Plus XD: No Burn® Plus XD intumescent coating is a latex-based coating manufactured by No-Burn, Inc., and is supplied in 1-gallon (4 L) and 5-gallon (19 L) pails and 55-gallon (208 L) drums. The coating material has a shelf life of 36 months when stored in factory-sealed containers at temperatures between 40°F (4.4°C) and 90°F (32.2°C).

3.5.3 ALDOCOAT 800: ALDOCOAT 800 intumescent coating is a water-based latex coating manufactured by ALDO Products Company, Inc., and is supplied in 5-gallon (18.9 L) pails. The coating material has a shelf life of six months when stored in factory-sealed containers at temperatures between 40°F (4.4°C) and 90°F (32.2°C).

3.5.4 SPRAYCOAT™ 1920 Intumescent Coating: SPRAYCOAT™ 1920 intumescent coating, supplied by BASF Corporation, is a single-component, water-based, liquid-applied, intumescent coating. The coating is supplied in 5-gallon (18.8 L) pails and 55-gallon (208 L) drums and has a shelflife of six months when stored in factory-sealed containers at temperatures between 45°F (7.2°C) and 75°F (23.9°C).

3.5.5 FlameSeal TB Intumescent Coating: FlameSeal TB intumescent coating, manufactured by Flame Seal Products, Inc., is a two-component, four-to-one-by-volume, liquid-applied, water-based polymeric intumescent coating. The coating is supplied in 6-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of six months when stored in factory-sealed containers at temperatures between 40°F (4°C) and 90°F (32°C).

3.5.6 DC315 Intumescent Coating: DC315 Intumescent Coating, manufactured by International Fireproof Technology Inc., is a 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 two years when stored in factory-sealed containers at temperatures between 41°F (5°C) and 95°F (35°C).

3.5.7 TPR^2 FIRESHELL® (IB-4) Coating: TPR^2 FIRESHELL® (IB-4) intumescent coating is a proprietary, water-based, one-part, nonflammable coating manufactured by TPR^2 Corporation. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of 12 months when stored in factory-sealed containers at temperatures between 45°F (7°C) and 75°F (24°C).

4.0 INSTALLATION

4.1 General:

ENERTITE® US and ENERTITE® NM must be installed in accordance with the manufacturer's published installation instructions and this report. The manufacturer's installation instructions and this report must be strictly adhered to, and a copy of the instructions and this evaluation report must be available on the jobsite at all times during installation.

4.2 Application:

The insulations must be applied using spray equipment specified by BASF Corporation. The product must not be used in areas which have a maximum service temperature greater than that specified in the manufacturer's published installation instructions, nor in electrical outlet or junction boxes or in contact with rain or water. The product must be protected from the weather during and after application. The insulations can be installed in multiple passes at $^1/_2$ to 6 inches (12.7 mm to 152 mm) per pass to the maximum thickness. Where multiple passes are required, the cure time between passes is minimum 5 minutes for a 2-inch (51 mm) pass.

4.3 Thermal Barrier:

4.3.1 Application with a Prescriptive Thermal Barrier: ENERTITE® US and ENERTITE® NM must be separated from the interior of the building by an approved thermal barrier, such as $^1/_2$-inch (12.7 mm) gypsum wallboard installed using mechanical fasteners in accordance with the applicable code, or an equivalent 15-minute thermal barrier complying with the applicable code. When installation is within an attic or crawl space, as described in Section 4.4, a thermal barrier is not required between the foam plastic and the attic or crawl space, but is required between the foam plastic and the interior of the building. Thicknesses of up to $11^1/_4$ inches (286 mm) for wall cavities and 16 inches (406 mm) for ceiling cavities are recognized, based on room corner fire testing in accordance with NFPA 286, when the insulation is covered with minimum $^1/_2$-inch-thick (12.7 mm) gypsum board or an equivalent thermal barrier complying with the applicable code.

4.3.2 Application without a Prescriptive Thermal Barrier: The ENERTITE® US may be installed without the 15-minute thermal barrier prescribed in the IBC Section 2603.4 and IRC Section R316.4, subject to the following conditions:

a. All surfaces of the ENERTITE® US must be covered with FlameSeal TB or DC315 intumescent coatings as follows:
   - FlameSeal TB: minimum application rate of 30 wet mils (1.9 gallons per 100 ft^2)
   - DC315: minimum application rate of 21 wet mils (1.25 gallons per 100 ft^2)

b. When covered with the intumescent coatings described in this section, the ENERTITE® US insulation must have a maximum installed thickness as follows:
   - FlameSeal TB: 6 inches (152 mm) in vertical walls and 12 inches (304mm) in ceilings.
   - DC315: 6 inches (152 mm) in vertical walls and 12 inches (304 mm) in ceilings.

4.4 Attics and Crawl Spaces:

4.4.1 Application with a Prescriptive Ignition Barrier: When ENERTITE® US and ENERTITE® NM 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 Section R316.5.3 or R316.5.4, as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable code and must be installed in a manner so that the foam plastic insulation is not exposed.

4.4.2 Application without a Prescriptive Ignition Barrier: ENERTITE® US and ENERTITE® NM insulations may be installed in an attic or crawl space without a prescriptive ignition barrier when all of the following conditions apply:

a. Entry to the attic or crawl space is only for the service of utilities and no storage is permitted.

b. There are no interconnected attic or crawl space areas.

c. Air in the attic or crawl space is not circulated to other parts of the building.

d. Combustion air is provided in accordance with IMC (*International Mechanical Code*®) Section 701.

e. Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806, except air-impermeable insulation is permitted in unvented attics in accordance with 2012 IRC Section R806.5 or 2009 IRC Section R806.4. Under-floor (crawl-space) ventilation is provided when required by IBC Section 1203.3 or IRC Section R408.1, as applicable.

The insulations may be spray-applied to the underside of roof sheathing and/or rafters in attics, and the underside of wood floors and/or floor joists in crawl spaces, as described in this paragraph and in Table 2. The maximum thickness of the foam plastic applied to the underside of the roof sheathing and to vertical wall surfaces must not exceed the thicknesses set forth in Table 2, based on the insulation type and the intumescent coating type and insulation thickness used. The intumescent coatings used to cover the foam plastic insulation are described in Section 3.5. The intumescent coating must be applied over the insulation in accordance with the coating manufacturer's instructions and at the thickness as described in Table 2. Surfaces to be coated must be dry, clean, and free of dirt, loose debris and other substances that could interfere with adhesion of the coating. The coating is applied with low-pressure airless spray equipment.

The coating must be applied with ambient and substrate temperature is at least 50°F (10°C). The insulation, at a minimum thickness of $3^1/_2$ inches (89 mm), may be installed in unvented attics as described in this section in accordance with 2012 IRC Section R806.5 or 2009 IRC Section R806.4.

4.4.3 Use on Attic Floors:

4.4.3.1 ENERTITE® US: ENERTITE® US insulation may be installed at a maximum thickness of $11^1/_4$ inches (286 mm) between joists in attic floors when covered with one of the coatings applied as described in Section 4.4.2. The ENERTITE® US insulation must be separated from the interior of the building by an approved thermal barrier.

4.4.3.2 ENERTITE® NM: When used on attic floors, ENERTITE® NM insulation may be installed at a maximum thickness of 16 inches (406 mm) between joists. The ignition barrier in accordance with IBC Section 2603.4.1.6, or IRC Section R316.5.3, may be omitted. The ENERTITE® NM insulation must be separated from the interior of the building by an approved thermal barrier.

5.0 CONDITIONS OF USE

The ENERTITE® US and ENERTITE® NM spray-applied polyurethane insulations described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 This evaluation report and the manufacturer's published installation instructions, when required by the code official, must be submitted at the time of permit application.

5.2 The insulation must be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. If there is a conflict between the installation instructions and this report, this report governs.

5.3 The insulation must be separated from the interior of the building by an approved 15-minute thermal barrier, except when installed as described in Section 4.3.2 or when installation is in attics and crawl spaces as described in Section 4.4.

5.4 The insulation must not exceed the thickness and density noted in Sections 3.2, 4.3 and 4.4.

5.5 The insulation must be protected from the weather during and after application.

5.6 The insulation 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.

5.7 Use of the insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with 2012 IBC Section 2603.9 or 2009 IBC Section 2603.8 or IRC Section R318.4, as applicable.

5.8 Jobsite certification and labeling of the insulation must comply with IRC Sections N1101.4 and N1101.4.1 and IECC Sections 303.1.1 and 303.1.2, as applicable.

5.9 A vapor retarder must be installed in accordance with the applicable code.

5.10 The insulations are manufactured in Houston, Texas, under a quality control program with inspections by UL LLC (AA-668).

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated November 2012 (editorially corrected April 2013).

6.2 Reports of room corner fire testing in accordance with NFPA 286 and UL 1715.

6.3 Reports of air permeance testing in accordance with ASTM E283 and ASTM E2178.

6.4 Reports of critical radiant heat flux of exposed attic floor in accordance with ASTM E970.

7.0 IDENTIFICATION

All packages and containers of ENERTITE® US and ENERTITE® NM insulations must be labeled with the BASF Corporation, name and address; the product name; the flame spread index and the smoke-developed index; the shelf life expiration date; the name of the inspection agency (UL LLC); and the evaluation report number (ESR-3102).

Intumescent coatings are identified with the manufacturer's name and address, the product trade name and use instructions.

8.0 OTHER CODES

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

- 2006 and 2003 *International Building Code®*
- 2006 and 2003 *International Residential Code®*
- 2006 and 2003 *International Energy Conservation Code®*

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

- **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 IECC.
- **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[1,2])

ENERTITE® US	
THICKNESS (inches)	***R*-VALUE (°F·ft²·h/Btu)**
1	3.7
2	7.1
3	11
3.5	12
4	14
5	17
5.5	19
6	21
7	24
7.5	26
8	28
9	31
9.5	33
10	34
11.5	40
12	41
16	55

ENERTITE® NM	
THICKNESS (inches)	***R*-VALUE (°F·ft²·h/Btu)**
1	3.9
2	7.6
3	11
3.5	13
4	15
5	19
5.5	21
6	22
7	26
7.5	28
8	30
9	33
9.5	35
10	37
11.5	43
12	45
16	59

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

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

TABLE 2—USE OF INSULATION IN ATTICS AND CRAWL SPACES WITHOUT A PRESCRIPTIVE IGNITION BARRIER

INSULATION TYPE	MAXIMUM THICKNESS (in) (Wall Cavities and Attic Floors)	MAXIMUM THICKNESS (in) (Underside of Roof Sheathing/Rafters and floors)	INTUMESCENT COATING MINIMUM THICKNESS AND TYPE (Applied to all Exposed Foam Surfaces)	MINIMUM APPLICATION RATEOF THE INTUMESCENT COATING	TESTS SUBMITTED (AC377)
ENERTITE® US	11 1/4	11 1/4	18 wet mils of ALDOCOAT 800 (9 mils dry film thickness)	1.12 gal / 100 ft²	Appendix X
ENERTITE® US	11 1/4	11 1/4	12 wet mils of No-Burn Plus (5 mils dry film thickness)	0.75 gal / 100 ft²	Appendix X
ENERTITE® US	9 1/4	11 1/4	14 wet mils of SPRAYCOAT™ 1920 (7 mils dry film thickness)	0.88 gal / 100 ft²	Appendix X
ENERTITE® US	6	12	30 wet mils of Flame Seal TB (19 dry mils film thickness)	1.90 gal / 100 ft²	Appendix A1.2.1 and A2.2.1
ENERTITE® US	6	12	21 wet mils of DC315 (14 dry mils film thickness)	1.25 gal / 100 ft²	Appendix A1.2.1 and A 2.2.1
ENERTITE® NM	11 1/4	16	8 wet mils of SPRAYCOAT™ 1920 (4 dry mils film thickness)	0.59 gal/100 ft²	Appendix X
ENERTITE® NM	11 1/4	16	(8 wet mils of FIRESHELL® (IB-4) (4 dry mils film thickness)	0.68 gal/100 ft²	Appendix X
ENERTITE® NM	11 1/4	16	6 wet mils of No-Burn Plus XD (4 mils dry film thickness)	0.37 gal / 100 ft²	Appendix X

ICC EVALUATION SERVICE

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ICC-ES Evaluation Report

ESR-3102 CBC and CRC Supplement

Reissued July 1, 2013

This report is subject to renewal August 1, 2015.

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

BASF CORPORATION
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EVALUATION SUBJECT:

ENERTITE® US AND ENERTITE® NM OPEN-CELL SPRAY POLYURETHANE FOAM INSULATIONS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2010 *California Building Code* (CBC)
- 2010 *California Residential Code* (CRC)
- 2010 *California Energy Code* (CEC)

Properties evaluated:

- Surface burning characteristics
- Physical properties
- Thermal resistance (*R*-values)
- Attic and crawl space installation
- Air permeability

2.0 PURPOSE OF THIS SUPPLEMENT

This supplement is issued to indicate that the Enertite® US and Enertite® NM insulations described in Sections 2.0 through 7.0 of the master report ESR-3102 comply with the 2010 *California Building Code* (CBC), the 2010 *California Residential Code* (CRC), and the 2010 *California Energy Code* (CEC), when installed in accordance with the master evaluation report under the following conditions:

- In accordance with Section 118 of the 2010 *California Energy Code*, verification of certification by the Department of Consumer Affairs, Bureau of Home Furnishings and Thermal Insulation, 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.”
- The insulations have not been evaluated under CBC Chapter 7A or CRC Section R327, for use in the exterior design and construction of new buildings located in a Fire Hazard Zone within a State Responsibility Area or any Wildland–Urban Interface Fire Area.
- The insulations have not been evaluated for compliance with the *International Wildland–Urban Interface Code®*.

This supplement expires concurrently with the master report, reissued July 1, 2013, revised November 2013.

ICC-ES Evaluation Report

ESR-3102 FBC Supplement

Reissued July 1, 2013
This report is subject to renewal August 1, 2015.

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www.spf.basf.com

EVALUATION SUBJECT:

ENERTITE® US AND ENERTITE® NM OPEN-CELL SPRAY POLYURETHANE INSULATIONS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that ENERTITE® US and ENERTITE® NM open-cell spray-applied polyurethane foam insulations, recognized in ICC-ES master report ESR-3102, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2010 *Florida Building Code—Building*
- 2010 *Florida Building Code—Residential*

2.0 CONCLULSIONS

The ENERTITE® US and ENERTITE® NM spray-applied polyurethane foam insulations described in Sections 2.0 through 7.0 of the master evaluation report comply with the 2010 *Florida Building Code—Building* and the 2010 *Florida Building Code—Residential*, provided the installation is in accordance with the *International Building Code®* (IBC) provisions noted in the master report.

Use of ENERTITE® US and ENERTITE® NM spray-applied polyurethane foam insulations has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the 2010 *Florida Building Code—Building* and the 2010 *Florida Building Code—Residential,* provided ENERTITE® US and ENERTITE® NM spray-applied polyurethane foam insulations used in exterior walls of multistory buildings located in the High-Velocity Hurricane Zone, comply with Section 2612.3.2.4 of the *Florida Building Code—Building.*

For products falling under Florida Rule 9N-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 master report, reissued on July 1, 2013, revised November 2013.