NCFI Polyurethanes
P. O. Box 1528 • Mount Airy, NC 27030
800.346.8229 www.NCFI.com

# TECHNICAL DATA SHEET

# InsulBloc® SPRAY FOAM SYSTEM (11-017)

## DESCRIPTION:

InsulBloc is a two component, self-adhering, seamless, closed cell, spray applied polyurethane foam system. This NCFI system has been formulated with highly insulating HFC-245fa as the blowing agent. The InsulBloc® insulation system is suitable for application on the exterior or interior side of Type I, II, III, IV, & V buildings as well as other insulation applications. It complies with AC 377 and ASTM C1029. InsulBloc is certified for application in ABAA projects.

## DISTINGUISHING CHARACTERISTICS:

- High R-Value
- Zero ODP
- Moisture Vapor Retarder - Class II @ 1.3”
- High Yields
- Approved with DC315 coating in lieu of code prescribed Thermal Barrier
- Air Barrier, ABAA Certified @1”
- Good Dimensional Stability
- Meets ASTM E-84, FS ≤25, SD ≤450 @ 4”
- FEMA Flood Resistance - Class 5
- Water Resistive Barrier (AC71) @1”
- Passed NFPA 285
- Approved in multiple UL Fire Resistive Assemblies
- Low VOC per CDPH Standard V 1.2, 2017

For proper use of this NCFI insulating material refer to the NCFI Application Information and any of the following codes or guides:

- 2018 International Building Code Chapter 26
- 2018 International Residential Code Section R316 and R806
- ICC-ES Evaluation Report 1615
- API Fire Safety Guidelines for Use of Rigid Polyurethane and Polyisocyanurate Foam Insulation in Building Construction (AX230)

## TYPICAL PHYSICAL PROPERTIES*[1]:

| | |
|---|---|
| Free Rise Core Density*[2] ASTM D 1622 | 2.0 pcf |
| Compressive Strength ASTM D 1621 | 27 psi |
| Moisture Vapor Transmission - ASTM E 96 | 1.3 perm·in |
| Closed Cell Content ASTM D 6226 | >90% |
| R-value @ 1” - ASTM C 518 | 6.8 |
| Air Permeance @1” Infiltration ASTM E 283 & 2178 Exfiltration | 0.000 cfm/ft$^2$ @ 1.57 psf<br>0.000 cfm/ft$^2$ @ 1.57 psf |
| Bacterial & Fungal Growth ASTM G 21 & E 1428 | Negligible*[3] |
| STC - ASTM E 90<br>OITC - ASTM E 90 | 31*[4]<br>24*[4] |
| Flammability ASTM E-84 @ 4 inches | Flame Spread ≤25<br>Smoke Dev ≤450 |
| Potential Heat—NFPA 259 | 1989 Btu/ft$^2$/inch |
| Max Service Temperature | 180ºF |

*[1]The above values are average values obtained from laboratory experiments and should serve only as guide lines.

*[2]Free rise core density should not be confused with overall density. Overall densities are always higher than free rise core densities and take into account skin formation, thickness of application, environmental conditions, etc.

*[3]See page 4 for details.

*[4]As measured in a 2” x 4” studwall assembly.

# InsulBloc® (11-017) Insulation

| R-Values* | | | | |
|---|---|---|---|---|
| Thickness (inches) | R-Value (°F·hr·ft$^2$ / Btu) | Moisture Vapor Perm | Installation Limitations with a prescriptive Thermal Barrier | Limitations with DC 315 Coating on the foam in lieu of a Thermal Barrier |
| 1 | 6.8 | 1.3 | No limit for Thickness in walls | In vertical wall max thickness 5.5" with DC 315 applied at 14 wet mils (9 dry mils) |
| 2 | 13 | 0.65 | | |
| 3 | 20 | 0.43 | | |
| 3.5 | 23 | 0.37 | | |
| 4.75 | 30 | 0.27 | | |
| 5.5 | 35 | 0.24 | No limit for Thickness in ceilings/roof decks | Underside of roof decks max thickness 9.5" with DC 315 applied at 14 wet mils (9 dry mils) |
| 6 | 38 | 0.22 | | |
| 9.5 | 61 | 0.14 | | |
| 10 | 64 | 0.13 | | |
| *Note: As with all insulating materials, the R-value will vary with age and use conditions. | | | | |

| Property | Test Method | Test Condition | Result |
|---|---|---|---|
| Air Barrier Certification | ASTM E 283 | Infiltration @ 1.57 psf | 1 inch thickness 0.0000 cfm/ft$^2$ |
| | ASTM E 2178 | Exfiltration @ 1.57 psf | 1 inch thickness 0.0000 cfm/ft$^2$ |
| Water Resistance | AATCC 127-1998 | @ 56.5 ft | 1 inch thickness No failure |
| | ASTM E 331 | 6.24 psf | 1 inch thickness No Penetration |

Approved for Wind-Uplift resistance when installed under the roof deck at rafter/truss connection. Florida Product Approval #9975 with plywood decks are rated to 190 psf and OSB decks are rated to 200 psf. Miami-Dade NOA with plywood decks rated to 142.5 psf.

InsulBloc® provides the Secondary Water Resistive Barrier

InsulBloc® closed cell spray foam system is an approved Air Barrier material per the Air Barrier Association of America (ABAA) and is certified per AC 71 as a Water Resistive Material when installed on the exterior side of walls. Exterior wall coverings of this spray foam system may be restricted. Contact NCFI for the current approvals.

# 11-017 Application Information

**STORAGE AND USE OF CHEMICALS:**
The InsulBloc chemicals consisting of the A2-000 and B11-017 drums should be between 65°F and 80°F for proper processing through the spray equipment. Chemicals shipped during winter or summer months may need extra time in moderate temperature storage to stabilize back in the proper application range. Cold chemicals can cause poor mixing, pump cavitation or other process problems due to higher viscosity at lower temperatures. Storing chemicals above 90°F should be avoided as much as possible. Excessively warm chemicals should be cooled prior to opening the drums. Do not store in direct sunlight. Keep drums tightly closed when not in use and under dry air or nitrogen pressure of 2-3 psi after they have been opened. When properly stored, unopened drums of A2-000 have a shelf life of 24 months and B11-017 drums have a shelf life of 6 months.

**SAFE HANDLING OF LIQUID COMPONENTS:**
Use caution in removing bungs from the container. Loosen the small bung first to allow any built-up vapor pressure to stabilize before completely removing. **B component will froth at elevated temperatures.** Avoid prolonged breathing of vapors. In case of chemical contact with eyes, flush with water for at least 15 minutes and get medical attention. For further information refer to www.spraypolyurethane.org, Resources box, “Health and Safety Product Stewardship Workbook for High-Pressure Application of SPF”.

**APPLICATION GUIDELINES:**
InsulBloc® is suitable for application to most construction materials including wood, masonry, concrete, and metal. Application can be to the exterior or interior side of wall surfaces. InsulBloc can be applied to surfaces that will be in contact with soil and intermittent contact with water, such as below grade exterior foundation and basement walls or under concrete slab floors. To ensure proper adhesion, all substrate surfaces should be dry, clean of dust or flaking surface rust, ice or frost. All metal surfaces must be free of oil, grease, etc. Uncoated metals may require a primer coat.

No flammable chemicals, such as wasp and hornet sprays, should be sprayed in the area of the foam application 24 hours before the application. No such chemical can be sprayed after the foam application until the foam has cooled to room temperature.

**APPLICATION AROUND PLASTIC PIPES:**
Based on a series of extensive studies, the InsulBloc® system can be applied in contact with PVC, CPVC, ABS, PP-R and PEX plastic pipes. The pipes must not be pressurized during the foam application. The foam pass applied in contact with the pipe should not exceed 2” thick in order to prevent excessive exothermic heat at the pipe to foam interface. Allow a 2 minute cooling between each additional foam pass. The total foam thickness is limited to that thickness permitted in that area of the building assembly.

**APPLICATION AROUND ELECTRICAL WIRES:**
Based on NCFI testing, the InsulBloc system can be applied in contact with electrical wires. Spray foam applicators must spray the foam in such a manner that the expanding foam does not stretch and distort the wires. Light gauge wires which will be encapsulated in the foam layer should have the foam installed behind the wires and allowed to cool prior to applying a top layer to cover the wire. Use a shallow lift of 3/4” of foam to cover the wire. Wait the required 2 minutes between passes when adding more foam thickness to achieve the desired R-value.

**APPLICATION PASS THICKNESS:**
Spraying foam will generate heat. Foam which is applied too thick in single passes can build temperatures which will degrade cell structure and not produce foam with optimum properties. In the most extreme case, InsulBloc could reach dangerously high temperatures inside the finished foam which could lead to splitting, charring, or even spontaneous combustion. The maximum pass thickness for InsulBloc is 4 inches, and a 2 minute cooling time is required before adding additional foam passes. Multiple layers can be applied to reach the desired R-value.

**VENTILATION OF SPRAY AREA:**
Spraying foam will generate a mist and fumes with a distinct odor. For interior applications the building area must be vented with fresh air to dissipate the odor. The amount of air flow and time for venting will vary based on each situation. A closed attic area may require fans to force air into and out of the space. An open building that does not have the doors and windows installed may have sufficient air flow to vent the odor fairly quickly. Reentry time for closed-in areas being vented with fans is typically about 24 hours. Other workers should remain out of the immediate area during this venting time period.

# InsulBloc® (11-017) Application Information

**EQUIPMENT AND COMPONENT RATIOS:**
InsulBloc should be sprayed with plural component proportioning pump designed for polyurethane spray foam. The B-11-017 drum is connected to the resin pumps with the A2-000 drum connected to the isocyanate pumps. The proportioning pump ratio is 1 to 1 by volume. The preheater and hose temperature should be set at 130°F to give a good pattern. Due to equipment variations, the application temperature settings may be adjusted to achieve a good spray pattern. For higher-pressure settings above 1,000 psi, temperature settings can be slightly lower.

**OPTIMUM ADHESION TEMPERATURE OF SURFACE TO BE SPRAYED:**
The surface should be between 10°F and 120°F. In this range the warmer the surface, the better the adhesion. NCFI has three grades of InsulBloc® foam for this application range: G-series designed for temperatures no lower than 50°F, M-series designed for temperatures as low as 20°F and the X-series, when processing must be conducted down to temperatures as low as 10°F. For best results, when surfaces to be sprayed are cooler than 60°F, a flash coat should be applied with the second coat following as soon as the original coat is no longer tacky to the touch.

**BACTERIA AND FUNGUS RESISTANCE:**
InsulBloc® is naturally able to inhibit the growth of bacteria and fungus (mold) per the ASTM G-21 and E-1428 tests. The anti-microbial properties do not protect occupants of spaces insulated with InsulBloc® from potential deleterious effects of molds, mold spores, or disease organisms that may be present in the environment.

**VAPOR BARRIER PROTECTION ON COLD STORAGE APPLICATIONS:**
When InsulBloc® is used in structures subject to continuous cold temperatures, such as coolers and freezers, a Class I moisture vapor barrier (0.1 perm or less) is normally required on the "warm" side of the foam insulation. Contact NCFI for specific recommendations.

**WEATHER PROTECTION OF FINISHED FOAM ON EXTERIOR APPLICATIONS:**
The finished surface of sprayed polyurethane foam should be protected from adverse effects of ultraviolet rays of direct sunlight which can cause dusting and discoloration. Protective coatings designed for use with polyurethane foam are available. On exterior applications where a masonry veneer or mechanically attached covering is to be installed, the InsulBloc® foam surface may be exposed to UV light up to 6 months.

**CODE-COMPLIANT FIRE RESISTANCE:**
Building Codes require foam plastic insulation, such as 11-017, be separated from the interior of the building by a 15 minute thermal barrier of ½" gypsum board or other approved material. Refer to specific building codes for details. 11-017 has passed testing with the DC315 intumescent coating in lieu of the thermal barrier. When covering the foam with DC315, the foam thickness on walls is limited to a maximum of 5.5" and on roof/ceiling assemblies the maximum thickness is 9.5". The DC315 is applied at 14 mils wet film thickness, or 1 gallon per 115 square feet.

**OTHER APPLICATION AND SAFETY CONSIDERATIONS:**
Before InsulBloc® is to be applied, there are many safety and application situations to consider. All spray foam applicators must evaluate the job prior to beginning the spray foam application. It is impossible to anticipate every issue and provide explicit guidance in this product data sheet. If there is a question regarding some aspect of the planned application, consult with NCFI for more guidance. The NCFI Product Stewardship Manual contains additional information and should be reviewed often enough by all spray foam applicators to remain familiar with the contents. The American Chemistry Council (ACC), the Center for Polyurethanes Industry (CPI) and the Spray Polyurethane Foam Alliance (SPFA) also publish information regarding the safe handling and application of spray foam chemicals.
If there are any questions regarding the application of the InsulBloc® system, contact an NCFI representative.