



Technical Data Sheet

NCFI 11-036 InsulStar® SmartSPF™ Spray Foam System

DESCRIPTION:

11-036 InsulStar® SmartSPF™ is a two component, self-adhering, seamless, closed cell, spray applied polyurethane foam insulation system. This system has been formulated with highly insulating HFO as the blowing agent. The InsulStar® SmartSPF™ insulation system is suitable for application on the exterior or interior side of Type I, II, III, IV, & V buildings and ABAA specified designs as well as other insulation applications.

DISTINGUISHING CHARACTERISTICS:

- High R-Value
- ABAA Specified Product
- Moisture Vapor Retarder - Class II @ 1.3"
- Low GWP
- High Yields
- Class II Moisture Vapor Retarder @1.3"
- Meets ASTM E84, FS ≤25, SD ≤450 @ 4"
- FEMA Flood Resistance - Class 5
- Water Resistive Barrier (AC71) @ 1"
- Low VOC per CDPH Standard V 1.2, 2017
- Passed NFPA 285
- Compliant with ASTM C1029, IAPMO ES1000, & ICC 1100
- Approved with DC315, No-Burn Plus ThB, Flame Control 60-60A, and Staycell OneStep in lieu of a prescribed Thermal Barrier

TYPICAL PHYSICAL PROPERTIES¹:

Free Rise Core Density ² ASTM D1622	2 pcf
Closed Cell Content ASTM D6226	>90%
R-value @ 1" ASTM C518	7.1
Air Perm @1/2" & 75 Pa ASTM E2178	≤ 0.02 perms
Moisture Vapor Perm ASTM E96 @ 1"	1.3 perms
Compressive Strength ASTM D1621	28 psi
Tensile Strength ASTM D1623	45 psi
Bacterial & Fungal Growth ASTM C1338	No Growth ³
Flammability ASTM E84 @ 4 inches	Flame Spread ≤25 Smoke Dev ≤450
STC - ASTM E90 OITC - ASTM E90	31 ⁴ 24 ⁴
Max Service Temperature	180°F

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

- 2021 International Building Code Chapter 26 or Residential Code Section R316 & R806
- NCFI Product Stewardship Manual
- UES Evaluation Report 667
- UES Evaluation Report 340
- API Fire Safety Guidelines for Use of Rigid Polyurethane and Polyisocyanurate Foam Insulation in Building Construction (AX230)
- Go to: polyurethane.americanchemistry.com and find the "Products, Resources, and Documents Library" tab

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

²Free 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.

³See page 4 for details.

⁴As measured in a 2" x 4" studwall assembly

Polyurethane products manufactured or produced from this liquid system may present a serious fire hazard if improperly used or allowed to remain exposed or unprotected. The character and magnitude of any such hazard will depend on a broad range of factors, which are controlled and influenced by the manufacturing and production process, by the mode of application or installation and by the function and usage of the particular product. **Any flammability rating contained in this literature is not intended to reflect hazards presented by this or any other material under actual fire conditions. These ratings are used solely to measure and describe the product's response to heat and flame under controlled laboratory conditions.** Each person, firm or corporation engaged in the manufacture, production, application, installation or use of any polyurethane product should carefully determine whether there is a potential fire hazard associated with such product in a specific usage, and utilize all appropriate precautionary and safety measures.



11-036 Application Information

R-Values*			
Thickness (inches)	R-Value (°F·hr·ft ² / Btu)	Moisture Vapor Perm	Installation Limitations with a prescriptive Thermal Barrier**
1	7.1	1.3	<p>No limit for Thickness in walls</p> <p>No limit for Thickness in ceilings/roof decks</p>
2	14	0.65	
3	20	0.43	
3.5	23	0.37	
4.5	30	0.29	
5.5	37	0.24	
6	40	0.22	
7	47	0.19	
8	53	0.16	
9	60	0.14	
*Note: As with all insulating materials, the R-value will vary with age and use conditions.			

** The 11-036 system has been tested and approved for applications without a prescriptive Thermal Barrier covering when coated with one of the following: DC315, No-Burn Plus ThBr, Flame Control 60-60A intumescent coating, or Staycell ONE STEP® 502 spray foam. The maximum foam thickness is limited in the wall or ceiling/roof decks. Contact NCFI for specific limitations and coverage rates.

Property	Test Method	Test Condition	Result
Air Barrier (ABAA Specified Product)	ASTM E 2357	Infiltration @ 1.57 psf	1 inch thickness 0.0087 cfm/ft ²
	ASTM E 2178	Exfiltration @ 1.57 psf	1 inch thickness 0.0000 cfm/ft ²
Water Resistance	AATCC 127-98	@ 56.5 ft	1 inch thickness No failure
	ASTM E 331	6.24 psf	1 inch thickness No Penetration

InsulStar® Smart SPF™ closed cell spray foam system is an approved Air and Water Resistive Barrier Evaluated 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.





11-036 Application Information

STORAGE OF 11-036 CHEMICALS:

Avoid storage in freezing temperatures. Storing chemicals above 90°F should be avoided as much as possible. Do not store in direct sunlight. The shelf life of unopened A2-000 is 24 months and the B11-036 is 6 months.

SPRAYING 11-036 CHEMICALS:

Chemicals should be between 65°F - 85°F for proper processing through the spray equipment. Chemicals shipped during winter or summer months may need extra time to stabilize back into the 65°F - 85°F range. Excessively warm chemicals should be cooled prior to opening the drums for safety and processing reasons. Cold chemicals can cause poor mixing, pump cavitation or other processing problems. Keep drums tightly closed when not in use and under dry air or nitrogen pressure of 2-3 psi after they have been opened.

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 go to www.spraypolyurethane.org and click on the Resources tab in the Professional Contractors section.

EQUIPMENT AND COMPONENT RATIOS:

The 11-036 system, consisting of the A2-000 and B11-036 components, is formulated for spraying with a two component pump specifically designed for spray polyurethane foam systems. The B drum is connected to the resin pumps and the A drum is connected to the isocyanate pumps. The proportioning pump ratio is 1 to 1. The dispensing temperature should be set at approximately 130°F to give a good pattern.

Due to equipment variations, the application temperature settings may need to be adjusted to achieve a good spray pattern. For pressure settings above 1,000 psi, the temperature settings can be slightly lower.

APPLICATION GUIDELINES:

11-036 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. 11-036 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, loose scale, 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.

11-036 Systems	Temperature Range Guideline
SLOW	70°F and up
REG	40°-80°F
FAST	10°-50°F

The above table is a guideline for optimal product performance. For Elevations above 4500ft: Order the HA (high altitude) product line.





11-036 Application Information

OPTIMUM ADHESION TEMPERATURE OF SURFACE TO BE SPRAYED:

The surface should be between 10°F and 120°F when applying 11-036. Adhesion will be better towards the warmer end of this range. When surface temperatures fall below 60°F, adhesion may be aided by applying a thinner flash coat followed by a thicker pass while the flash coat is still warm but no longer tacky to the touch. Another technique to improve adhesion in studwall assemblies is to apply a cant along the side of the studs (picture framing), before filling in the center of the stud bay.

APPLICATION PASS THICKNESS:

Spraying foam will generate heat. Foam which is applied too thick in single passes can build temperatures which will not produce foam with the optimum properties. In the most extreme case, 11-036 could reach dangerously high temperatures inside the finished foam which could lead to splitting, charring, or even spontaneous combustion. The maximum recommended pass thickness for 11-036 is 4 inches, which should be limited to warmer substrates. When applying pass thicknesses greater than 2 inches, wait 10 minutes or until the foam surface has cooled to ambient temperature before adding additional foam passes. Multiple layers can be applied to achieve the desired R-value.

ATTICS and CRAWL SPACES

11-036 has passed testing for application in limited access attics and crawl spaces without the code prescribed ignition barrier covering. The foam thickness can be up to 8" on wall cavities and 10" in ceiling cavities.

APPLICATION AROUND ELECTRICAL WIRES:

Refer to the NCFI Applicator Bulletin "Spray Foam Application Around 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, then wait about 2 minutes to allow the foam to cool before adding more foam passes to achieve the desired R-value.

APPLICATION AROUND PLASTIC PIPES:

Refer to the NCFI Applicator Bulletin "Spraying Polyurethane Foam to CPVC and Other Types of Plastic Pipes". 11-036 system can be applied in contact with plastic pipes. The pipes must not be pressurized during the foam application. The foam must be applied in a manner where the expanding foam does not distort the pipe. The foam pass applied in contact with the pipe should not exceed 2" thickness in order to prevent excessive exothermic heat at the pipe to foam interface. Allow 2 minutes cooling between each additional foam pass.

VAPOR BARRIER PROTECTION ON EXTREME TEMPERATURE INSULATION APPLICATIONS:

When 11-036 is applied to insulate buildings which maintain continuous cold or hot temperatures, such as coolers/freezers or indoor swimming pools, a Class I moisture vapor retarder (0.1 perm or less) is normally required on the "warm" side of the foam insulation. Contact the design professional or NCFI for specific recommendations.





11-036 Application Information

VENTILATION OF SPRAY AREA:

Spraying foam will generate a mist and airborne particulates. For interior applications the building area must be vented with fresh air to dissipate the particulates. The amount of air flow and time for venting will vary based on each situation. Details regarding ventilation is provided in the Spray Foam Coalition document "Ventilation Considerations for Spray Polyurethane Foam" found in the NCFI Product Stewardship Manual (PSM). SPF contractors should refer to this guidance prior to beginning any spray foam application project. Reentry time and re-occupancy time is provided in the NCFI Technical Bulletin "Ventilation Requirements for Reentry of Spaces After Spraying Closed Cell Spray Foams".

OTHER APPLICATION AND SAFETY CONSIDERATIONS:

Before 11-036 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. For any questions regarding the application of the 11-036 system, contact an NCFI representative.

BACTERIA AND FUNGUS RESISTANCE:

InsulStar® is naturally able to inhibit the growth of bacteria and fungus (mold) per the ASTM C1338 test. The anti-microbial properties do not protect occupants of spaces insulated with InsulStar® from potential deleterious effects of molds, mold spores, or disease organisms that may be present in the environment.

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 InsulStar® SmartSPF™ foam surface may be exposed to UV light up to 6 months.

CODE-COMPLIANT FIRE RESISTANCE:

Building Codes require foam plastic insulation, such as 11-036, to be separated from the interior of the building by a 15 minute thermal barrier of ½" gypsum board or other approved material. Refer to UES ER 667 for details. When Fire Resistive Wall Assemblies are required, contact NCFI Polyurethanes for specific alternate approvals for InsulStar® SmartSPF™.

The information on our data sheets is to assist customers in determining whether our products are suitable for their applications. The customers must satisfy themselves as to the suitability for specific cases. NCFI warrants only that the material shall meet its specifications. This warranty is in lieu of all other written or unwritten, expressed or implied warranties, and NCFI expressly disclaims any warranty of merchantability, fitness for a particular purpose, or freedom from patent infringement. Accordingly, buyer assumes all risks whatsoever as to the use of the material. Buyer's exclusive remedy as to any breach of warranty, negligence or other claim shall be limited to the purchase price of the material. Failure to adhere to any recommended procedures shall relieve NCFI of all liability with respect to the material or the use thereof.

