



NCFI 11-033 InsulStar® 1.7 OPTIMAXX Technical Data Sheet

DESCRIPTION:

11-033 InsulStar® 1.7 OPTIMAXX is a two component, self-adhering, seamless, closed cell, spray applied polyurethane foam system. This system has been formulated with a highly insulating HFO as the blowing agent. The InsulStar® 1.7 OPTIMAXX insulation system is suitable for application on the interior building envelope of Type I, II, III, IV, & V buildings as well as other insulation applications.

DISTINGUISHING CHARACTERISTICS:

- Low GWP
- High Yields
- High R-Value
- Meets ASTM E-84, FS ≤ 25 , SD ≤ 450 @ 4"
- Air Impermeable Insulation @ 1/2"
- Class II Moisture Vapor Retarder @ 1.7"
- FEMA Flood Resistance - Class 5
- Low VOC per CDPH Standard V 1.2, 2017
- No Bacterial & Fungal Growth ASTM C1338

R-Values*	
Thickness (inches)	R-Value (°F-hr-ft ² / Btu)
1	7.1
2	14
3	20
3.5	23
5.5	37
6	40
7	47
8	53
9	60

*Note: As with all insulating materials, the R-value will vary with age and use conditions.

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

- 2021 International Building Code Chapter 26 or Residential Code Section R316 & R806
- NCFI Product Stewardship Manual

TYPICAL PHYSICAL PROPERTIES¹:

Free Rise Core Density ² ASTM D 1622	1.7 pcf
Closed Cell Content ASTM D 6226	>90%
R-value @ 1" - ASTM C 518	7.1
Air Perm @ 1/2" ASTM E2178	≤ 0.02
Moisture Vapor Perm ASTM E96	1.7 perms
Compressive Strength ASTM D1621	27 psi
Tensile Strength ASTM D1621	45 psi
Flammability ASTM E-84 @ 4 inches	Flame Spread ≤ 25 Smoke Dev ≤ 450
Max Service Temperature	180°F

¹These are average values obtained from laboratory testing and should serve only as guidelines.

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.

- UES ER 667 Code Compliance Report
- 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

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.



11-033 Application Information

STORAGE OF 11-033 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 B-11-033 is 6 months.

SPRAYING 11-033 CHEMICALS: Chemicals should be between 65°F and 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 to 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 11-033 system, consisting of the A2-000 and B-11-033 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. Dispensing temperature should be set at approximately 120°F and adjusted as needed 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:

11-033 is suitable for application to most construction materials including wood, masonry, concrete, and metal. 11-033 should not be applied to surfaces that will be in contact with soil and intermittent contact with water. 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.

APPLICATION PASS THICKNESS:

Spraying foam will generate heat. Foam which is applied too thick in a single pass can build temperatures which will not produce foam with optimum properties. In the most extreme case, 11-033 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 11-033 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.

OPTIMUM ADHESION TEMPERATURE OF SURFACE TO BE SPRAYED:

The surface should be between 30°F and 120°F when applying 11-033. Adhesion will typically be better on warmer substrates. When surface temperatures fall below 60°F, adhesion may be aided by applying a thinner flash coat followed by a full thickness 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 before filling in the center of the stud bay.

11-033 Systems	Temperature Range Guidelines
SUMMER (SLOW)	70°F and Up
REG	40°F - 80°F
WINTER (FAST)	10°F - 50°F

ATTICS and CRAWL SPACES

11-033 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" in wall cavities and 10" in ceiling cavities.





11-033 Application Information

APPLICATION AROUND PLASTIC PIPES:

Based on a series of extensive studies, the 11-033 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" thickness in order to prevent excessive exothermic heat at the pipe to foam interface. Wait the required 2 minutes between each additional foam pass to allow the foam to cool. The total foam thickness is limited to the thickness permitted in that area of the building assembly.

APPLICATION AROUND ELECTRICAL WIRES:

Based on NCFI testing, the 11-033 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. To encapsulate light gauge wires in the foam, spray foam behind the wires and allow it to cool for 2 minutes before applying a lift of approximately 3/4 inch to cover the wire. Allow this pass to cool to near ambient temperature to avoid excessive heat build up before applying additional passes to achieve the desired R-value thickness.

BACTERIA AND FUNGUS RESISTANCE:

11-033 is naturally able to inhibit the growth of bacteria and fungus (mold) per ASTM C1338. The anti-microbial properties do not protect occupants of spaces insulated with 11-033 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 11-033 is used in structures subject to continuous cold or hot temperatures, such as coolers/freezers or indoor swimming pools, 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.

CODE-COMPLIANT FIRE RESISTANCE:

Building Codes require foam plastic insulation, such as 11-033, be separated from the interior of the building by a 15 minute thermal barrier of 1/2" gypsum wallboard 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® 1.7 OPTIMAXX.

OTHER APPLICATION AND SAFETY CONSIDERATIONS:

Before 11-033 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 11-033 system, contact an NCFI representative.

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. Refer to the NCFI Technical Bulletin "Ventilation Requirements for Reentry of Spaces After Spraying Closed Cell Spray Foams". SPF contractors should refer to this guidance prior to beginning any spray foam application project. Other workers and occupants should remain out of the immediate area during this venting time period.

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.

