

SPRAY FOAM SYSTEM 11-016

DESCRIPTION:

11-016 is a two component, one-to-one by volume, self-adhering, seamless, high insulating efficiency spray applied closed cell polyurethane foam system. This NCFI system has been formulated with HFC-245fa as the blowing agent and contains an anti-microbial ingredient to inhibit the growth of molds. 11-016 is suitable for use in the NCFI InsulStar[®] insulation system as well as other insulation applications. 11-016 is certified for application in Type I, II, III, IV & V buildings and is approved for ABAA projects. Complies with ASTM C1029 and AC 377.

DISTINGUISHING CHARACTERISTICS:

- High R-Value
- Zero ODP
- Moisture Vapor Retarder - Class II @ 1.3"
- High Yields
- High Closed Cell Content
- Air Barrier, ABAA Certified
- Good Dimensional Stability
- Meets ASTM E-84, FS ≤ 25 , SD ≤ 450 @ 4"
- FEMA Flood Resistance - Class 5
- Water Resistive Barrier (AC71)
- Passed NFPA 285
- Approved in multiple UL Fire Resistive Assemblies

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

- International Building Code, (IBC), Chapter 26
- International Residential Code (IRC) Section R316 and R806
- API Fire Safety Guidelines for Use of Rigid Polyurethane and Polyisocyanurate Foam Insulation in Building Construction (AX230)

Installation Limitations
Limits based on NFPA 286

When covered with 1/2" gypsum board	Maximum Thickness in walls	Maximum Thickness in Ceilings
11-016	8"	12"

TYPICAL PHYSICAL PROPERTIES:

Core Density - ASTM 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 inch ASTM C 518 @3.5 inch	6.8 23.4
Air Permeance - Infiltration ASTM E 283 & 2178 Exfiltration	0.000 cfm/ft ² @ 1.57 psf 0.000 cfm/ft ² @ 1.57 psf
Bacterial & Fungal Growth ASTM G 21 & E 1428	Negligible*
STC - ASTM E 90 OITC	31** 24**
Flammability ASTM E-84 @ 4 inches	Flame Spread ≤ 25 Smoke Dev ≤ 450
Max Service Temperature	180°F
Water Penetration AATCC 127-1998 @ 56 Feet	No Failure

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

*NCFI 11-016 is formulated with an anti-microbial. See back of this page for details.

** As measured in 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.

11-016 APPLICATION INFORMATION

EQUIPMENT AND COMPONENT RATIOS:

It is preferred that this system be processed with Graco Polyurethane Spray Equipment. 11-016R is connected to the resin pumps with 11-016A being connected to the isocyanate pumps. The proportioning pump ratio is 1 to 1. Graco preheater and hose temperature should be set at 130°F to give a good pattern. For high-pressure equipment, temperature settings may be slightly higher.

STORAGE AND USE OF CHEMICALS:

Keep temperature of chemicals above 70°F for several days before use. Cold chemicals can cause poor mixing, pump cavitations or other process problems due to higher viscosity at lower temperatures. Storage temperature should not exceed 90°F. Do not store in direct sunlight. Keep drums tightly closed when not in use and under nitrogen pressure of 2-3 psi after they have been opened. The shelf life of 11-016 is six months.

SAFE HANDLING OF LIQUID COMPONENTS:

Use caution in removing bungs from the container. Loosen the small bung first and let any built up gas escape before completely removing. **R 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 "MDI-Based Polyurethane Foam Systems: Guidelines for Safe Handling and Disposal" publication AX-119 published by the Center For The Polyurethanes Industry 1300 Wilson Blvd, Suite 800, Arlington, VA 22209.

PREPARATION OF SURFACE TO BE SPRAYED:

11-016 is suitable for application to most construction materials including wood, masonry, concrete, and metal. Application can be to the interior or exterior side of wall surfaces. All surfaces to be sprayed should be clean, dry, and free of dew or frost. All metal to which foam is to be applied must be free of oil, grease, etc. The maximum thickness of each layer or pass of foam should be 2" and allow 10 minutes between each pass for cooling. Multiple layers can be applied to reach the desired R value.

OPTIMUM ADHESION TEMPERATURE OF SURFACE TO BE SPRAYED:

On general work where the surface to be sprayed will remain at ambient temperature or cooler, the surface should be between 10°F and 120°F. In this range the warmer the surface the better the adhesion. NCFI has two grades of 11-016 foam for this application range, G-series for 50°F to 120°F and X-series for temperatures 10°F to 60°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. Also, NCFI differentiates between formulas designed to be sprayed at low altitudes (below 4000 ft) versus high altitudes by "L" and "H".

GL— Warm weather at low altitudes
GH— Warm weather at high altitudes
XL— Cold weather at low altitudes
XH— Cold weather at high altitudes

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. Where an exterior masonry veneer or mechanically attached covering is to be installed, the foam surface may be exposed to UV light up to 6 months.

VAPOR BARRIER PROTECTION ON COLD STORAGE APPLICATIONS:

When NCFI sprayed polyurethane foam insulates 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.

CODE-COMPLIANT FIRE RESISTANCE:

Where foam is sprayed over large areas of building interiors, building codes require the installation of an approved thermal barrier between the foam plastic insulation and the interior of the building. ½" gypsum board or other tested and approved material may be installed as a thermal barrier. Refer to specific building codes for details. Contact NCFI Polyurethanes for specific alternate approvals for 11-016.

*NCFI 11-016 is formulated with an anti-microbial ingredient to inhibit the growth of molds. The anti-microbial properties do not protect occupants of spaces insulated with 11-016 from potential deleterious effects of molds, mold spores, or disease organisms that may be present in the environment.

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 strictly to any recommended procedures shall relieve NCFI of all liability with respect to the material or the use thereof.