

COMFORT FOAM[®] 178 Series BUILDING ENVELOPE INSULATION ICC ESR-2642



DESCRIPTION:

COMFORT FOAM 178 is a two-component closed-cell spray polyurethane foam system utilizing an EPA-approved, zero ozone-depleting blowing agent. It is designed for use in residential construction insulation system applications. **COMFORT FOAM 178** is compatible with most common construction materials, but can only be processed with ELASTOSPRAY[®] 8000A Isocyanate. The benefits of **COMFORT FOAM 178** include:

- Superior insulation
- Controls moisture infiltration
- Controls air infiltration
- Non-fibrous
- Structural enhancement

TYPICAL PROPERTIES⁽¹⁾

PROPERTY	METHOD	COMFORT FOAM 178
Resin:		
Specific Gravity @ 70°F	ASTM D 1638	1.175
Viscosity @ 70°F (cps)	Brookfield	500
Cured Foam:		
Density, core (pcf @ 2" lifts)	ASTM D 1622	2.0 – 2.3
Thermal Resistance (aged) k-factor (Btu in/ft ² hr °F)	ASTM C 518	0.149 @ 1-in thick 0.145 @ 4-in thick
R-value (ft ² hr °F/Btu in) ⁽²⁾	Calculated	6.7 / in @ < 4-in thick 6.9 / in @ ≥ 4-in thick
Compressive Strength (psi)	ASTM D 1621	26 ± 5% [^]
Water Vapor Transmission – Permeability (perm-inch)	ASTM E 96	1.39
Water Vapor Transmission – Permeance (perms)	ASTM E 96	1.39 @ 1" thickness 0.70 @ 2" thickness 0.46 @ 3" thickness 0.35 @ 4" thickness
Water Absorption (vol %)	ASTM D 2842	0.60
Tensile Strength (psi)	ASTM D 1623	62.4 (Type C)
Response to Thermal and Humid Aging (% linear change) 158°F / 97% RH / 168 hrs	ASTM D 2126	4.9
Closed Cell Content (%)	ASTM D 6226	98
Surface Burning Characteristics		
Flame Spread Index ⁽³⁾	ASTM E 84	≤ 25
Smoke Developed Index	ASTM E 84	≤ 350

The coefficient of thermal expansion varies between 3×10^{-5} and 4×10^{-4} 1/K or 1.5×10^{-5} and 2×10^{-4} 1/°F. The lower end of the range relates to closed-cell SPF while the higher values were reported for open-cell foams.

(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:

- Gusmer[®] H-20/35 proportioner set at 1:1 volume ratio with 50 ft of heated delivery hose
- Gusmer[®] GX-7 spray-gun configured with a #1 mix module and #70 PCD and/or GAP spray-gun configured with a #1 mix chamber
- Process temperature settings: Isocyanate 130°F; Resin 130°F; Hose 130°F
- Process pressure: 1000 psig minimum while spraying

ADDITIONAL TESTING, APPROVALS & CERTIFICATIONS:

- ASTM E 84 (Class I) with Product Listing⁽³⁾ (4)
- ICC-ES Evaluation Report ESR-2642
- ASTM C 1029 – Type II Compliant
- AIR LEAKAGE

PROPERTY	METHOD	COMFORT FOAM 178
Air Leakage (L/s*m ² @ 75 Pa ΔP)	ASTM E 283	<0.005 @ 1.0 inch

- NFPA 286 per IBC Section 803⁽⁴⁾
- Approved for Attics & Crawl Spaces Installations with and without prescriptive ignition barriers per ICC-ES AC377, Appendix A1.2.2 and Appendix X
- Florida Building Code Approval
 - FL 13001.1 – Spray Polyurethane Foam Adhesive System; Fillet Application (Outside HVHZ; - 160 psf design pressure)
 - FL 13001.2 – Spray Polyurethane Foam Adhesive System; Full Insulating Layer Application (Outside HVHZ; - 200 psf design pressure)
- California Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation

COMFORT FOAM 178 has been tested and is considered a Very Low VOC Emitting Product per environmental chamber test following ASTM D 5116 or ASTM D 6670.

- Analyses based on EPA Method IP-1B and ASTM D 6196 for VOC's by thermal desorption followed by gas chromatography/mass spectrometry (TD/GC/MS), and EPA IP-6A and ASTM D 5197.

COMFORT FOAM 178 has high microbial resistance and is suitable for use in homes, schools and commercial buildings.

- Complies with GREENGUARD Test Method, "Method For Measuring Microbial Resistance From Various Sources Using Static Environmental Chambers", according to ASTM D 6329-98.

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

Please contact your local Sales or Technical Representative for specific questions regarding **COMFORT FOAM 178** properties, approvals, or certifications.

(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.

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GENERAL INFORMATION:

COMFORT FOAM 178 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:

COMFORT FOAM 178 is designed for an application rate of ½ inch minimum to 2 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-2642 for additional information. This application procedure is in compliance with the Spray Polyurethane Foam Alliance (SPFA).

COMFORT FOAM 178 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. COMFORT FOAM 178 should NOT be installed in these types of constructions unless the structure was designed by a design professional for specific use as cold storage.

COMFORT FOAM 178 is designed for installation in most standard construction configurations using common materials such as wood and wood products, metal and concrete. COMFORT FOAM 178 has performed successfully when sprayed onto wood substrates down to 30°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

and 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.

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 COMFORT FOAM 178 or any polyurethane foam.

SHELF LIFE AND STORAGE CONDITIONS:

COMFORT FOAM 178 Series has a shelf life of approximately (3) 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.

While descriptions, designs, data and information contained herein are presented in good faith and believed to be accurate, they are provided for guidance only. Because many factors may affect processing or application/use, BASF recommends that the reader make tests to determine the suitability of a product for a particular purpose prior to use. No warranties of any kind, either expressed or implied, including warranties of merchantability or fitness for a particular purpose, are made regarding products described or designs, data or information set forth, or that the products, designs, data or information may be used without infringing the intellectual property rights of others. In no case shall the descriptions, information, data or designs provided be considered a part of BASF's terms and conditions of sale. Further the descriptions, designs, data, and information furnished by BASF hereunder are given gratis and BASF assumes no obligation or liability for the description, designs, data or information given or results obtained, all such being given and accepted at the reader's risk.

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

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