NATURAL-THERM® 2.0 HFO

Natural-Therm® 2.0 HFO is a closed cell, two-component, semi-rigid spray polyurethane foam insulation with a zero ozone depleting potential and low GWP blowing agent and a nominal 2.0 PCF in-place density. These products provide energy efficiency and air infiltration control as a high-performance building envelope insulation system. Natural-Therm® 2.0 HFO offers a self-adhering, seamless insulation that can be used in many areas of the building envelope, including open wall cavities, crawl spaces, perimeter rim joists, cathedral ceilings, and garage ceilings.

Features

- Low VOC[1]
- Low GWP Blowing Agent
- R-Value > 7/inch (Nominal)
- Air Seal
- FEMA Class 5 Flood Resistance[2]
- Soil-Gas (Radon) Retarder

1 www.ul.com/gg
2 https://www.fema.gov/sites/default/files/2020-07/fema_tb_2_rev1.pdf

Standards, Codes Compliance

- Meets ICC-ES AC377 Type I-IV and V-B
- Code Evaluation Report IAPMO ER-714
- UL GREENGUARD GOLD
- Compliant with State HFC Regulations
- Tested for Radon Resistance (NRC A1-023490)

Applications

- Wall Cavities
- Vented Attics
- Unvented Attics
- Ceilings
- Unvented Crawl Spaces
- Vented Crawl Spaces
- Rim Joists
- Floors
- Under Slab
- Foundation Walls

Packaging, Storage, and Shelf Life

A Component: 55 US Gallons, Closed-Top Steel Drum – 500 lb. net wt.
B Component: 55 US Gallons, Closed-Top Steel Drum – 475 lb. net wt.

Store containers between 50°F and 80°F. Containers should be opened carefully to allow any pressure buildup to be vented safely while wearing full safety protection. Excessive venting of the B Component may result in higher density foam and reduced yield.

Shelf Life: 6 months when stored in the original unopened container at 50°F–80°F. Excessive low or high temperatures may decrease shelf life.

Processing: Drum temperatures should be conditioned to 70°F–80°F before application to ensure optimal viscosity and mixing.

Equipment

The proportioning equipment must be manufactured specifically for heating, mixing, and spray application of polyurethane foam and be able to maintain 1:1 metering with a +/-2% variance and adequate main heating capacity to deliver heated and pressurized materials up to 150°F.

Physical Properties

PROPERTY	TEST METHOD	VALUE
Thermal Resistance	See Table Below	
R-Value at 1 inch[1, 2]	ASTM C518	7.2
R-Value at 3.5 inches		25
Core Density	ASTM D1622	Nominal 2.0 PCF
Compressive Strength[3]	ASTM D1621	37.98 psi
Tensile Strength[3]	ASTM D1623	16.05 psi
Dimensional Stability	ASTM D2126	
158°F 100% RH (168 h)		2.22%
Air Permeance (1 inch)	ASTM E2178	Meets criteria
Vapor Permeance (>1.1 inch)	ASTM E96	<1.0 perms (Class II)
Closed Cell Content	ASTM D6226	> 90%
FIRE TEST RESULTS[4]		
Flame Spread	ASTM E84 (Complies with Class 1)[4]	< 25
Smoke Developed		< 450
Thermal Barrier[5]	NFPA 286 / UL 1715 (so it reads: NFPA 286 / UL 1715)	Pass with 14 mils (wet) DC 315 Pass with 14 mils (wet) No-Burn Plus ThB
Ignition Barrier[5]	NFPA 286 AC 377 Appendix X	Pass without an intumescent coating
Wall Assembly	NFPA 285	Pass — Type Class I-IV, V-B Construction

1 Properties shown are representative values for 1-inch-thick material, unless otherwise specified.
2 R means the resistance to heat flow; the higher the value, the greater the insulation power. This insulation must be installed properly to get the marked R-value.
3 Value at yield or 10% deflection, whichever occurs first.
4 These laboratory tests are not intended to describe the hazards presented by this material under actual fire conditions.
5 Reference IAPMO ER-714 for guidance on maximum application thicknesses on vertical and horizontal surfaces.

Thermal Resistance — R-Values

THICKNESS (INCHES)	°F*FT²*H/BTU
1	7.2
2	14
3.5	25
4	28
5	35
5.5	39
6	42
7	49
7.5	53
8	56
9	63
9.5	67
10	70

For SI: 1 inch = 25.4 mm, °F *ft2*h/Btu = 0.176 K*m²/W
1 R-values are calculated based on tested K values at 1-inch and 4-inch thickness for Natural-Therm® 2.0 HFO Series.

Safety and Handling

Exposure — Read and understand the Safety Data Sheet (SDS) for this product before use. Personnel must use appropriate respiratory, skin, and eye Personal Protective Equipment (PPE) when handling and applying polyurethane spray foam systems. Both Components A and B can cause severe inhalation and skin sensitization. For interior applications: full body protection required. A comprehensive review of SPF safety and handling can be found on the CPI website.

Fire — Polyurethane foam may present a fire hazard if exposed to fire or excessive heat (i.e., cutting torches). 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 prescribed by applicable building code(s). Proper authorities with jurisdiction over a particular area should always be consulted for additional or specific requirements prior to beginning any project.

Ventilation and Implications for Re-Entry/Re-Occupancy

During application of Natural Polymers Natural-Therm® 2.0 HFO, a minimum of 10 ACH is recommended and maintained for **at least two hours post spraying prior to re-entry** of trade workers and **24 hours for re-occupancy**. Cross-ventilation is required with negative pressure in the spray area and exhaust to a secured empty area. If recommended ventilation rates cannot be achieved, a 24-hour re-entry time and re-occupancy time is recommended for trade workers and building occupants. For more detailed information, please visit American Chemistry Council.

Temperature and Humidity

Recommended substrate temperatures:

	2.0 IBS HFO	2.0 IBW HFO
Minimum	32°F	20°F
Maximum	100°F	77°F

Moisture in the form of rain, dew, and frost can seriously affect the quality and adhesion of the Natural-Therm® 2.0 HFO to the substrate or itself. Natural Polymers does not recommend the spraying of this system when the relative humidity (RH) exceeds 85% or when temperatures are less than 5°F above dew point. When heating the interior of a building, the relative humidity can change dramatically and should be constantly monitored to ensure proper application.

Surface Preparation

Natural-Therm® 2.0 HFO must be applied to surfaces that are clean and dry and free of dirt, oil, solvent, grease, loose particulates, frost, ice, and other foreign matter that could inhibit adhesion.

SUBSTRATE	CONSIDERATIONS	PRIMING
Wood (OSB, Plywood, Lumber)	Moisture <18%	Not required unless porosity or moisture issues exist[1]
Concrete (CMU, Structural, Pour-in-Place)	28-day min. cure	Not required unless specified or adhesion testing supports[1]
Metal (Steel, Painted, Aluminum,[1] Galvanized[1])	Clean of oils, dry	May be required based on adhesion testing; Recommended for Al, Galvanized Surfaces[1]
Plastics (PVC, CPVC)	Compatible	Not required

1 SPFA-143 — Primers for Spray Polyurethane Foam Insulation and Roofing Systems.

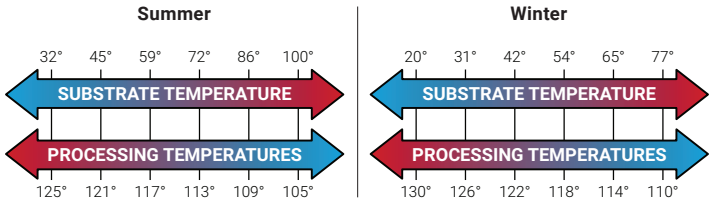
Spraying

Natural-Therm® 2.0 HFO is designed to provide optimal yield when sprayed in 2-inch- to 4-inch-thick passes. Excessive pass thickness above 4 inches can reduce physical properties and cause local overheating and possible fire. Additional thickness may be applied with a 5-to-10-minute waiting period between lifts. Natural-Therm® 2.0 HFO will cool down fast, so you may spray multiple passes over the same lift. Yield and in-place density is dependent upon the temperature of the substrate, ambient air temperature, gun speed of application, gun tip size, and the output of the proportioner to provide maximum yield when sprayed in 4-inch-thick passes. In freezing conditions, job site air temperature must be consistently maintained above 32 degrees to ensure proper curing.

Processing Guidance

	IBS	IBW
Ambient Temperature	50°F–100°F	32°F–80°F
MACHINE SETTING TEMPERATURE		
A Component Pre-heaters	105°F–125°F	110°F–130°F
B Component Pre-heaters		
Hoses		
Spray Pressure (Dynamic)	1100–1,500 psi	
PROCESSING CHARACTERISTICS		
Cream Time	1–2 (Seconds)	0.5–2 (Seconds)
Tack-Free Time	6–7 (Seconds)	4–5 (Seconds)
Initial Cure Time	<1 Hour**	<1 Hour[1]

1 Complete cure will depend on temperature, humidity, and degree of ventilation. Complete cure usually occurs within 24–72 hours.



Certifications and Sustainable Features

IAPMO ES 714 · IAPMO QCC Quality Control Consultants · GREENGUARD Gold · Insulation Contractors Association of America ICAA · International Fireproof Technology Inc. IFTI

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