



Performance+

Duct Liner
with ECOSE® Technology

Product Data Sheet

05/2024



Description

Performance+™ Duct Liner is a flexible, mat-faced insulation bonded with ECOSE Technology. It is faced with a tightly bonded mat to give the airstream a smooth, tough surface, resisting damage during installation and operation. The encapsulant edge coating eliminates airstream flaring. Airstream surface mat facing is treated with an EPA-registered antimicrobial agent to aid in the prevention of fungal and bacterial growth. Provides an optimum combination of efficient sound absorption, low thermal conductivity and minimal airstream surface friction.

Application

- Interior insulation material for sheet metal ducts used in heating, ventilating and air conditioning

Certifications



Contractor: _____

Job: _____

Date: _____

Specification Compliance

U.S.

- ASTM C1071; Type I
- ASTM G21 and G22
- NFPA 90A and 90B
- ASHRAE 62

Canada

- CAN/ULC S102
- CAN/CGSB-51.11-92

Indoor Air Quality

- **asthma & allergy friendly®**
- Verified Healthier Air™
- UL Environment
 - GREENGUARD Certified
 - GREENGUARD Gold Certified
 - Validated to be Formaldehyde-Free
- Does not contain polybrominated diphenyl ethers (PBDE) such as:
 - Penta – BDE, Octa – BDE or Deca – BDE
- EUCEB Certified

Technical Data

Property (Unit)	Test	Performance
Corrosiveness	ASTM C665	Does not accelerate corrosion of steel
Corrosion	ASTM C1617	Pass
Maximum Service Temperature	ASTM C411	250° F (121° C)
Maximum Air Velocity*	ASTM C1071, UL 181 Erosion Test	Max. 6,000 ft./min. (30.5 m/sec.)
Water Vapor Sorption (by weight)	ASTM C1104	Less than 3%
Mold Growth	ASTM C1338, ASTM G21, ASTM G22	Pass
	UL 2824	Resistant to mold
Surface Burning Characteristics (flame spread/smoke developed)	ASTM E84, UL 723, CAN/ULC S102	FHC 25/50; UL Classified

*Tested at 12,500 ft./min per UL 181 - 2.5 times certified velocity rating

Forms Available

Density	Thickness**	Width	Length
1.5 PCF (24 kg/m ³)	1" (25 mm)	34"-36"* (864 mm-915 mm) 46"-48" (1,168 mm-1,219 mm) 56"-72" (1,422 mm-1,829 mm)	50' (15.24 m)
			100' (30.48 m)
			140' (42.67 m)
			200' (60.96 m)
	1.5" (38 mm)		50' (15.24 m)
			90' (27.43 m)
			50' (15.24 m)
			100' (30.48 m)
2" (51 mm)	30' (9.14 m)		
2.0 PCF (32 kg/m ³)	0.5" (13 mm)	34"-36"* (864 mm-915 mm) 46"-48" (1,168 mm-1,219 mm) 56"-72" (1,422 mm-1,829 mm)	100' (30.48 m)
	1" (25 mm)		50' (15.24 m)
			100' (30.48 m)
			50' (15.24 m)
	1.5" (38 mm)		

*Widths of 34"-36" are available with one edge coated.

**Non-standard widths for all 0.5", 1", 1.5", and 2" products from 34"-36", 46"-48" and 56"-72" are available in 0.25" (6.35 mm) increments of minimum order quantity.

Thermal Conductance “C”* and Resistance “R”+ (ASTM C177)

		Mean Temperature	
Product		Conductance “C”	Resistance “R”
1.5 PCF (24 kg/m ³)	1” (25 mm)	0.24 (1.42)	R-4.2 (0.74)
	1.5” (38 mm)	0.17 (0.97)	R-6.0 (1.06)
	2” (51 mm)	0.13 (0.74)	R-8.0 (1.41)
	3” (76 mm)	0.08 (0.47)	R-12 (2.11)
2.0 PCF (32 kg/m ³)	0.5” (13 mm)	0.48 (2.73)	R-2.1 (0.37)
	1” (25 mm)	0.24 (1.36)	R-4.2 (0.74)
	1.5” (38 mm)	0.16 (0.91)	R-6.3 (1.11)

*C Units” $\frac{\text{BTU}}{\text{ft}^2 \cdot \text{hr} \cdot \text{F}} \left(\frac{\text{W}}{\text{m}^2 \cdot \text{C}} \right)$ †R Units” $\frac{\text{ft}^2 \cdot \text{hr} \cdot \text{F}}{\text{BTU}} \left(\frac{\text{m}^2 \cdot \text{C}}{\text{W}} \right)$

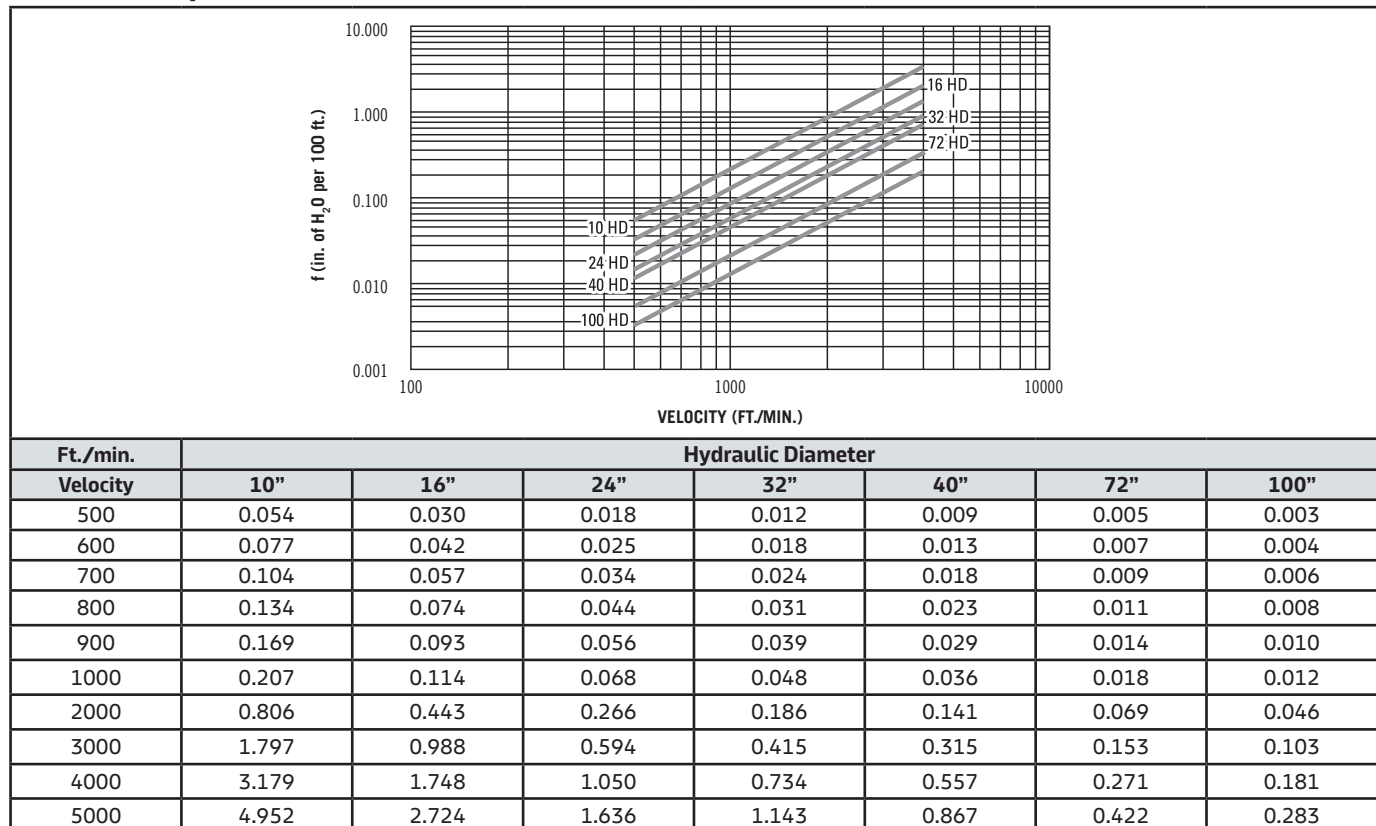
*The lower the value, the better the performance. †The higher the value, the better the performance.

Sound Absorption Coefficients & Noise Reduction Coefficients| ASTM C423, Type A Mounting

Type		Octave Band Center Frequency (cycles/sec.)						NRC
		125	250	500	1000	2000	4000	
1.5 PCF (24 kg/m ³)	1” (25 mm)	0.18	0.28	0.73	0.85	0.91	0.90	0.70
	1.5” (38 mm)	0.23	0.50	0.87	0.92	0.93	0.93	0.80
	2” (51 mm)	0.37	0.76	1.02	1.00	0.98	0.92	0.95
	3” (76 mm)	0.60	0.93	1.21	1.03	1.00	0.96	1.05
2.0 PCF (32 kg/m ³)	0.5” (13 mm)	0.10	0.17	0.43	0.59	0.73	0.75	0.50
	1” (25 mm)	0.25	0.35	0.69	0.89	0.96	1.01	0.70
	1.5” (38 mm)	0.27	0.55	0.87	0.99	1.00	0.98	0.85

NOTE: ASHRAE Handbook for HVAC Applications – Sound and Vibration Control contains insertion loss values for lined sheet metal ducts

Friction Loss | Inches of Water Per 100’



Mechanical Fastener Location

Velocity per ft./min. (m/sec.)	0-2500 (0-12.7)	2501-5000 (12.7-25.4)
A. From corners of duct	4" (102 mm)	4" (102 mm)
B. From transverse end of duct liner	3" (76 mm)	3" (76 mm)
C. Across width of duct, on centers (min. 1/side)	12" (305 mm)	6" (152 mm)
D. Across length of duct, on centers (min. 1/side)	18" (457 mm)	16" (406 mm)

Liner Interior Width

No. Pins	Inches	(mm)
0	≤ 8	≤ 203
2	9-16	229-406
3	17-28	432-711
4	29-40	737-1016
5	41-52	1041-1321
6	53-64	1346-1626
7	65-76	1651-1930
8	77-88	1956-2235
9	89-100	2261-2540

Application and Specification Guidelines

Storage

- Inside storage is recommended.

Fabrication and Application

- Fabricate in compliance with the latest edition of "NAIMA's Fibrous Glass Duct Liner Standard."
- Liner shall be folded and compressed in the corners of rectangular duct sections or shall be cut and fit to assure lapped, compressed joints. Longitudinal joints in duct liner should occur at the corners of ducts. However, duct size and standard duct liner product dimensions may make exposed longitudinal joints necessary. In such cases, the exposed joints shall be coated with adhesive and additionally secured with mechanical fasteners in accordance with NAIMA Fibrous Glass Duct Liner Standard. All damaged areas of the air stream surface shall be repaired with an adhesive which conforms to ASTM C916.
- Liner should be adhered to the duct with 90% minimum area coverage of an adhesive which conforms to ASTM C916.
- Mechanical fasteners should not compress the insulation more than 1/8" (3 mm), and shall be installed perpendicular to the duct surface. All fasteners should comply with the guidelines of NAIMA's "Fibrous Glass Duct Liner Standard and the Mechanical Fastener's Standard MF-1-1975."
- Metal nosings shall be securely installed over transversely oriented liner edges facing the airstream at fan discharge, at access doors and at any interval of lined duct preceded by unlined duct. In addition, where velocities exceed 4,000 ft./min. (20.3 m/sec.), metal nosing shall be used on upstream edges of liner at every transverse joint (See illustration)

Limitations

- Should not be used in systems operating at velocities exceeding 6,000 ft./min. (30.5 m/sec.) or at temperatures above 250° F (121° C).

Maintained Duct Systems are Key

The best way to ensure that an HVAC system, whether bare metal or internally insulated, will continue to provide efficient, quiet air delivery, occupant comfort, and cost-effectiveness is by following a regular system operation and maintenance schedule. This, along with a high-efficiency filtration system, assures protection of both HVAC system components and building occupants. Maintenance procedures include inspection, detection, and remediation of probable sources of airborne contaminants and moisture.

Fiberglass and Mold

Fiberglass insulation will not sustain mold growth. However, mold can grow on almost any material when it becomes wet and contaminated. Carefully inspect any insulation that has been exposed to water. If it shows any sign of mold, it must be discarded. If the material is wet but shows no evidence of mold, it should be dried rapidly and thoroughly. If it shows signs of facing degradation from wetting, it should be replaced.

Insulation used in direct contact with air streams that provide conditioning to occupied spaces must be discarded if exposed to water.

Sustainability

Knauf Insulation products with ECOSE® Technology are made using our patented, bio-based binder – a smarter alternative to the phenol/formaldehyde (PF) binder traditionally used in fiberglass products. The bio-based binder holds our product together, gives the product its unique appearance and makes it formaldehyde-free. All of our products are made from sustainable resources, such as recycled glass and sand. And we're proud to be putting glass bottles back to work rather than into landfills. Our products are made with a minimum of 50% recycled glass—totaling an average of 26 million bottles.

Notes

When condensation is permitted to occur between nested Performance+ Duct Liner and galvanized steel panels, discoloration of the metal may occur. If necessary, can be cleaned in accordance with NAIMA's "Cleaning Fibrous Glass Insulated Air Duct Systems Recommended Practices".

Check with your Knauf Insulation Territory Manager to ensure information is current.

The chemical and physical properties of this product represent average values determined in accordance with accepted test methods. The data is subject to normal manufacturing variations. The data is supplied as a technical service and is subject to change without notice. References to numerical flame spread ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions.

This product is covered by one or more U.S. and/or other patents.

See patent www.knaufnorthamerica.com/patents

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