



Knauf Data Sheet

CI-DLR-DS 08-14

Rigid Plenum Liner

with ECOSE® Technology



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Description

Knauf Insulation Rigid Plenum Liner with ECOSE® Technology is a heavy-density mat-faced glass mineral wool board insulation bonded with ECOSE® Technology. Its base board is brown with a black mat facing to give the airstream a smooth, tough surface, that resists damage during installation and operation.

ECOSE® Technology

ECOSE® Technology is a revolutionary binder chemistry that makes Knauf Insulation products even more sustainable than ever. It features rapidly renewable bio-based materials rather than non-renewable petroleum-based chemicals traditionally used in glass mineral wool insulation products. ECOSE® Technology reduces binder embodied energy and does not contain phenol, formaldehyde, acrylics or artificial colors.

Application

Knauf Insulation Rigid Plenum Liner with ECOSE® Technology is specifically designed as an interior insulation material for heating, ventilating and air conditioning plenums and sheet metal ducts. It offers an optimum combination of efficient sound absorption, low thermal conductivity and minimal air surface friction.

Features

- Low thermal conductivity
- Fire-resistant, non-corrosive
- Tough and resilient
- Knauf Insulation achieved GREENGUARD Gold Certification. Products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. Knauf Insulation has achieved a UL Environment claim validation for over 50% post-consumer recycled glass content in our insulation products.
- Sustainability
 - Carbon negative: meaning Knauf Insulation products used for thermal insulating purposes recover the energy that it took to make them in just hours or a few days, depending on the application. Once installed, the product continues to save energy and reduce carbon generation as long as it is in place.
 - Glass mineral wool insulation with ECOSE® Technology contains three primary ingredients:
 - Sand, one of the world's most abundant and renewable resources

- A minimum 50% recycled post-consumer glass content and UL Environment verification every 6 months
- ECOSE® Technology which reduces binder embodied energy by up to 70%

Benefits

- Energy conservation
- Better temperature control
- Lower operating costs
- Greatly reduces noise from fans and mechanical equipment as well as cross-talk and air movement
- Withstands damage from normal handling and shop abuse
- If necessary, can be cleaned in accordance with NAIMA's "Cleaning Fibrous Glass Insulated Air Duct Systems Recommended Practices."

Specification Compliance

In U.S.:

- ASTM C 1071; Type II
- ASTM G 21
- GREENGUARD Certified®
- GREENGUARD GOLDSM
- California Title 24
- NFPA 90A and 90B

In Canada:

- CAN/ULC S102-M88

Technical Data

Surface Burning Characteristics

- UL/ULC Classified
- Does not exceed 25 Flame Spread, 50 Smoke Developed when tested in accordance with ASTM E 84, CAN/ULC S102-M88, NFPA 255 and UL 723

Temperature Range (ASTM C 411)

- Up to 250°F (121°C). Max thick 3"

Air Velocity (ASTM C 1071)

- Maximum 5000 fpm (1524 mpm)
- Tested to 12,500 fpm (3810 mpm)

Corrosiveness (ASTM C 665)

- Does not accelerate corrosion on steel, copper or aluminum

Corrosion (ASTM C 1617)

- The corrosion rate in mils/yr will not exceed that of the 1 ppm chloride solution.

Water Vapor Sorption (ASTM C 1104)

- Less than 5% by weight

Microbial Growth (ASTM C 1338)

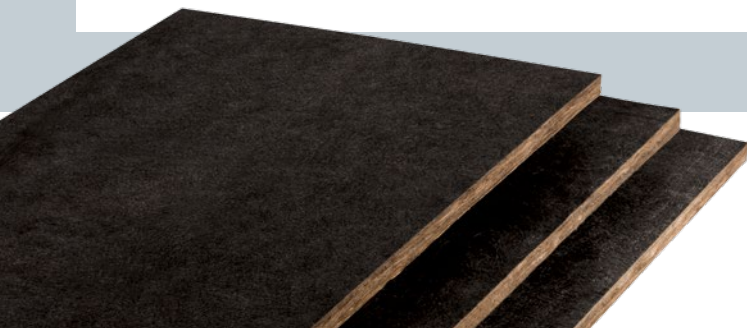
- Does not promote or support the growth of mold, fungi or bacteria

Application and Specification Guidelines Storage

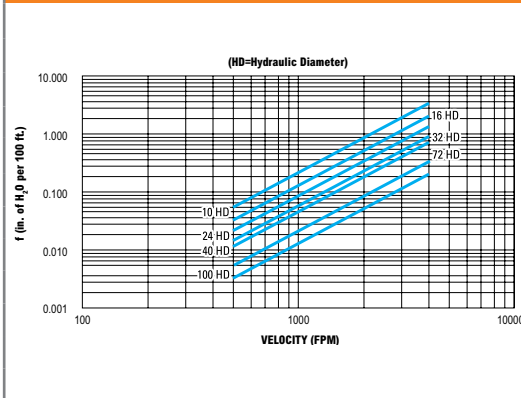
Inside storage is recommended. Protect stored Rigid Plenum Liner from water damage or abuse. If stored outside, stack cartons on pallets and cover adequately to prevent moisture infiltration.

Fabrication and Application

- Install Knauf Insulation Rigid Plenum Liner in metal duct and plenums operating at 250°F (121°C) service temperature or less and velocities of 5000 fpm (1524 mpm) or less.
- Liner shall be applied with the treated surface facing toward the air stream.
- Mechanical fasteners shall not compress the liner more than 1/8" (3.2 mm) and shall be installed perpendicular to the airstream surface. All fasteners must meet "Standard for Mechanical Fasteners-MF-1-1975."
- Adhesives which conform to ASTM C 916 shall be applied to the sheet metal with at least 90% coverage.
- All internal duct areas designated to be lined shall be completely covered with liner. Transverse joints shall be firmly butted together with no gaps, and coated with adhesive. All exposed leading edges shall be coated with adhesive.
- Mechanical fasteners shall be used to secure the rigid plenum liner and spaced in accordance with the chart and diagram to the right.
- Corner joints shall be overlapped so no gaps are present. Top pieces shall be supported by side pieces.
- All longitudinal joints shall be coated with adhesive conforming to ASTM C 916 at velocities over 2500 fpm (762 mpm).
- All damaged areas to the airstream surface shall be repaired with an adhesive that conforms to ASTM C 916.



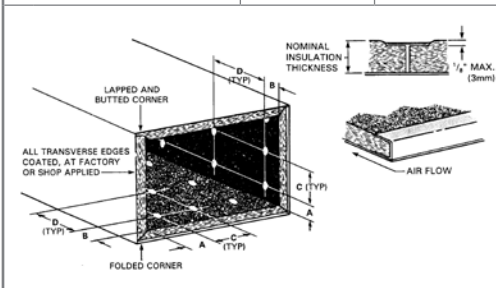
Friction Loss (Inches of water per 100')



FPM	Hydraulic Diameter						
Velocity	10"	16"	24"	32"	40"	72"	100"
500	.056	.031	.018	.013	.010	.005	.003
600	.080	.044	.026	.018	.014	.007	.004
700	.108	.059	.035	.025	.019	.009	.006
800	.140	.077	.046	.032	.024	.012	.008
900	.176	.096	.058	.040	.031	.015	.010
1000	.216	.118	.071	.050	.038	.018	.012
2000	.845	.463	.278	.194	.147	.071	.048
3000	1.887	1.034	.620	.432	.328	.159	.106
4000	3.340	1.831	1.097	.765	.580	.281	.188
5000	5.206	2.854	1.710	1.193	.904	.438	.293

Mechanical Fastener Location

Velocity/fpm (meters/second)	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)	12" (305 mm)
D Across length of duct, on centers (min. 1/side)	18" (457 mm)	18" (457 mm)



Sound Absorption Coefficients (ASTM C 423, Type A Mounting)

Product	Octave Band Center Frequency (cycles/sec.)						
	125	250	500	1000	2000	4000	NRC
3.0 PCF 1" (48 kg/m ³ 25 mm)	.13	.24	.56	.83	.92	.98	.65
3.0 PCF 1.5" (48 kg/m ³ 38 mm)	.19	.41	.89	1.02	1.03	1.04	.85
3.0 PCF 2" (48 kg/m ³ 51 mm)	.33	.67	1.07	1.07	1.03	1.06	.95

Thermal Conductance "C"¹ and Resistance "R"² (ASTM C 177)

Product	Mean Temperature 75°F (24°C)	
	Conductance "C"	Resistance "R"
3.0 PCF 1" (48 kg/m ³ 25 mm)	.23 (1.31)	4.3 (.76)
3.0 PCF 1.5" (48 kg/m ³ 38 mm)	.15 (.85)	6.5 (1.15)
3.0 PCF 2" (48 kg/m ³ 51 mm)	.11 (.62)	8.7 (1.53)

"C" Units: $\frac{\text{BTU}}{\text{ft}^2 \cdot \text{hr} \cdot ^\circ\text{F}} \left(\frac{\text{W}}{\text{m}^2 \cdot ^\circ\text{C}} \right)$ "R" Units: $\frac{\text{ft}^2 \cdot \text{hr} \cdot ^\circ\text{F}}{\text{BTU}} \left(\frac{\text{m}^2 \cdot ^\circ\text{C}}{\text{W}} \right)$

¹The lower the value, the better the performance. ²The higher the value, the better the performance.

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Forms Available*			
Thickness	Density	Width	Length
1"	3.0 PCF	24" (610 mm) and 48" (1219 mm)	48" (1219 mm) and 96" (2438mm)
1½"			36" (914 mm), 72" (1829 mm), 96" (2438 mm), 120" (3048 mm)
2"			

*Consult price sheet for minimum order quantities. Pallets available on made-to-order basis.

Glass Mineral Wool and Mold

Glass mineral wool 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. Air handling insulation used in the air stream must be discarded if exposed to water.

Notes

The chemical and physical properties of Knauf Insulation Rigid Plenum Liner with ECOSE® Technology represent typical average values determined in accordance with accepted test methods. The data is subject to normal manufacturing and testing 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. When condensation is permitted to occur between nested Rigid Plenum Duct Liner and galvanized steel panels, discoloration of the metal may occur. Check with your Knauf Insulation sales representative to assure information is current.



GREENGUARD GoldSM

Knauf Insulation achieved GREENGUARD Gold Certification.

GREENGUARD Certification ProgramSM

Products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit ul.com/gg.

Knauf Insulation has achieved a UL Environment claim validation for over 50% post-consumer recycled glass content in our insulation products.



LEED Eligible Product

Use of this product may help building projects meet green building standards as set by the Leadership in Energy and Environmental Design (LEED) Green Building Rating System. MR Credit 4.1 - 4.2 Recycled Content MR Credit 5.1 - 5.2 Regional Materials



This product has been tested and is certified to meet the EUCEB requirements.