DATA SHEET

Earthwool® Insulation Board

with ECOSE® Technology

DESCRIPTION

Earthwool Insulation Board is a versatile product for thermal and acoustical applications made from highly resilient, inorganic glass fibers bonded with ECOSE Technology. It is available plain or with a factory-applied foil-scrim-kraft (FSK) facing or all-service jacket (ASJ+).

APPLICATION

- Heating and air conditioning ducts
- Power and process equipment
- Boiler and stack installations
- Metal and masonry walls
- Wall and roof panel systems
- Curtain wall assemblies
- Cavity walls

SPECIFICATION COMPLIANCE

U.S.

- UL/ULC Classified (FSK, ASJ+)
- ASTM C612;
  - Type IA (1.6, 2.25, 3.0, 4.25, 6.0 PCF) (26, 36, 48, 68, 96 kg/m³),
  - Type IB (3.0, 4.25, 6.0 PCF) (48, 68, 96 kg/m³)
- ASTM C553; Type I, II, III (1.6 PCF)
- ASTM C1136 (facing);
  - Type I, II, III, IV, VIII, X (ASJ+), Type II, IV (FSK)
- California Title 24
- HH-B-100B; Type I (ASJ+ facing), Type II (FSK facing)
- HH-I-558C;
  - Form A, Class 1 (1.6, 2.25, 3.0, 4.25, 6.0 PCF) (26, 36, 48, 68, 96 kg/m³)
  - Form A, Class 2 (3.0, 4.25, 6.0 PCF) (48, 68, 96 kg/m³)
- NFPA 90A and 90B

- ASTM C795, MIL-I-24244, NRC Reg. Guide 1.36 (Certification needs to be specified at time of order, **special custom order required for certification**)

Canada

- CAN/ULC S102
- CGSB 51-GP-10M
- CGSB 51-GP-52M (facings)

CONTRACTOR: _____

JOB: _____

DATE: _____

DOING MORE FOR THE WORLD WE LIVE IN.

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 each month.

with ECOSE® TECHNOLOGY

INDOOR AIR QUALITY

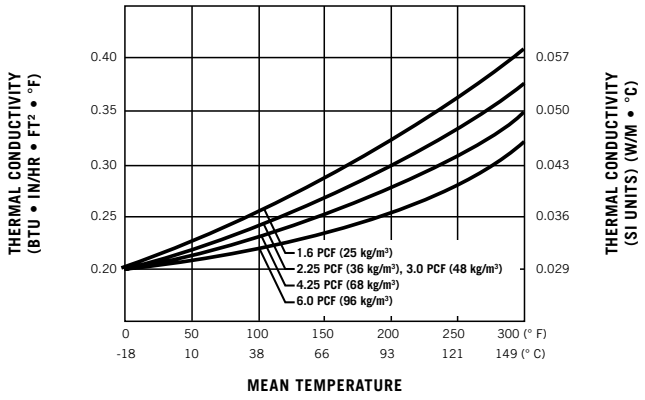
- UL Environment
  - GREENGUARD Certified
  - GREENGUARD Gold Certified
  - Validated to be Formaldehyde-Free
- Does not contain polybrominated diphenyl ethers (PBDE) such as: Penta–BDE, Octa–BDE or Deca–BDE
- EUCEB Certified
- IgCC Section 806.6 compliant

TECHNICAL DATA		
Property (Unit)	**Test**	**Performance**
Corrosiveness	ASTM C665	Does not accelerate corrosion of steel
Corrosion	ASTM C1617	Pass
Maximum Service Temperature	ASTM C411	450° F (232° C)
Bursting Strength	ASTM D774	FSK facing: 40 PSI, ASJ+ facing: 100 PSI
Water Vapor Permeance	ASTM E96, Procedure A	FSK facing: 0.02 perms ASJ+ facing: 0.01 perms
Water Vapor Sorption (by weight)	ASTM C1104	Less than 5%
Shrinkage	ASTM C356	Less than 0.3%
Mold Growth	ASTM C1338	Pass
Surface Burning Characteristics (flame spread/smoke developed)	ASTM E84, UL 723, CAN/ULC S102, NFPA 90A and 90B	UL/ULC Classified FHC 25/50

FORMS AVAILABLE*		
Density	**Thickness**	**R-Value (R-SI)**
1.6 PCF (26 kg/m³)	1½" (38 mm)	R-6.3 (1.1)
	2" (51 mm)	R-8.3 (1.5)
	3" (76 mm)	R-12.5 (2.2)
	4" (102 mm)	R-16.7 (2.9)
2.25 PCF (36 kg/m³)	1" (25 mm)	R-4.3 (0.8)
	1½" (38 mm)	R-6.5 (1.1)
	2" (51 mm)	R-8.7 (1.5)
	3" (76 mm)	R-13.0 (2.3)
	4" (102 mm)	R-17.4 (3.1)
3.0 PCF (48 kg/m³)	1" (25 mm)	R-4.3 (0.8)
	1½" (38 mm)	R-6.5 (1.1)
	2" (51 mm)	R-8.7 (1.5)
	2½" (64 mm)	R-10.9 (1.9)
	3" (76 mm)	R-13.0 (2.3)
	4" (102 mm)	R-17.4 (3.1)
4.25 PCF† (68 kg/m³)	1" (25 mm)	R-4.3 (0.8)
	1½" (38 mm)	R-6.5 (1.1)
	2" (51 mm)	R-8.7 (1.5)
	2½" (64 mm)	R-10.9 (1.9)
6.0 PCF† (96 kg/m³)	1" (76 mm)	R-4.5 (0.8)
	1½" (89 mm)	R-6.8 (1.2)
	2" (102 mm)	R-9.1 (1.6)

*Available in widths of 24" (610 mm) and 48" (1219 mm) and lengths from 36" to 120" (915 mm to 3048 mm).
†Cartons only.

THERMAL CONDUCTIVITY | ASTM C177



Mean Temperature	1.6 PCF		3.0 PCF		6.0 PCF	
	k	k(SI)	k	k(SI)	k	k(SI)
75° F (24° C)	0.24	0.035	0.23	0.033	0.22	0.032
100° F (38° C)	0.25	0.036	0.24	0.035	0.23	0.033
200° F (93° C)	0.33	0.048	0.29	0.042	0.27	0.039
300° F (149° C)	0.42	0.061	0.37	0.053	0.34	0.049

SOUND ABSORPTION COEFFICIENTS I ASTM C423, TYPE A MOUNTING									
Type	Facing	Thickness	Octave Band Center Frequency (cycles/sec.)						
			125	250	500	1000	2000	4000	NRC
1.6 PCF (26 kg/m³)	Plain	1½" (38 mm)	0.19	0.44	0.86	0.98	1.00	1.02	0.80
		2" (51 mm)	0.31	0.57	0.96	1.04	1.03	1.03	0.90
		2½" (64 mm)	0.43	0.82	1.12	1.07	1.04	1.03	1.00
		3" (76 mm)	0.47	0.92	1.17	1.06	1.06	1.04	1.05
2.25 PCF (36 kg/m³)	Plain	1" 25 mm)	0.05	0.24	0.59	0.86	0.97	1.00	0.65
		1½" (38 mm)	0.17	0.49	0.93	1.03	1.03	0.99	0.85
		2" (51 mm)	0.26	0.62	1.05	1.07	1.04	1.05	0.95
	FSK	1" (25 mm)	0.14	0.69	0.81	0.99	0.55	0.27	0.75
		2" (51 mm)	0.63	0.76	1.11	0.75	0.42	0.22	0.75
3.0 PCF (48 kg/m³)	Plain	1" (25 mm)	0.08	0.23	0.62	0.88	0.96	0.99	0.65
		1½" (38 mm)	0.09	0.39	0.89	1.03	1.06	1.01	0.85
		2" (51 mm)	0.29	0.65	1.11	1.13	1.06	1.03	1.00
		3" (76 mm)	0.54	1.01	1.18	1.07	1.07	1.04	1.10
		4" (102 mm)	0.95	1.11	1.17	1.07	1.07	1.06	1.10
	FSK	1" (25 mm)	0.21	0.63	0.84	0.93	0.51	0.22	0.75
		1½" (38 mm)	0.45	0.60	0.99	0.73	0.53	0.27	0.70
		2" (51 mm)	0.67	0.77	0.93	0.74	0.47	0.28	0.75
	ASJ+	1" (25 mm)	0.15	0.71	0.65	0.82	0.41	0.16	0.65
		1½" (38 mm)	0.42	0.55	0.91	0.69	0.40	0.23	0.65
		2" (51 mm)	0.75	0.71	0.80	0.66	0.41	0.24	0.65
4.25 PCF (68 kg/m³)	Plain	1" (25 mm)	0.06	0.24	0.69	0.99	1.05	1.02	0.75
	ASJ+	2½" (64 mm)	0.75	0.63	0.63	0.62	0.41	0.25	0.55
6.0 PCF (96 kg/m³)	Plain	1" (25 mm)	0.05	0.26	0.77	1.04	1.04	1.03	0.80
		1½" (38 mm)	0.13	0.58	1.01	1.05	1.00	1.01	0.90
		2" (51 mm)	0.32	0.81	1.08	1.06	1.03	1.04	1.00
	FSK	1" (25 mm)	0.23	0.65	0.39	0.48	0.47	0.32	0.50
		1½" (38 mm)	0.61	0.47	0.78	0.61	0.51	0.35	0.60
		2" (51 mm)	0.77	0.50	0.72	0.58	0.53	0.41	0.60
	ASJ+	1½" (38 mm)	0.60	0.46	0.62	0.48	0.47	0.31	0.50
		2" (51 mm)	0.77	0.44	0.60	0.50	0.41	0.30	0.50

CERTIFICATIONS

APPLICATION & SPECIFICATION GUIDELINES

Storage

- Protect material from water damage or other abuse. Cartons are not designed for outside storage. Vacuum packaged material can be stored outside if care is taken not to puncture the poly bag.

Preparation

- Apply the product on clean, dry surfaces. Metal ducts must be sealed before application. Prescore rigid insulation board where necessary to conform to curved surfaces.

Application: General

- All insulation joints must be firmly butted. Insulation can be secured with mechanical fasteners or banded. Minimum compression is to be used to assure firm fit and still maintain thermal performance.
- Vapor retarders should overlap a minimum of 2" (51 mm) at all seams, and be sealed with appropriate pressure sensitive tape or mastic. When applying pressure sensitive tapes, the tape must be firmly rubbed with a proper sealing tool to make sure the closure is secure. Follow tape manufacturer's recommendations.
- Fasteners shall be located a maximum of 3" (76 mm) from each edge and spaced 12"–16" (305–406 mm) on center.
- Where vapor retarder performance is necessary, all penetrations and facing damage shall be repaired with tapes or mastic with a minimum of 2" (51 mm) overlap. Tapes should be applied using a sealing tool and moving pressure. Use on ducts, plenums, vessels, tanks and equipment operating at temperatures of 450° F (232° C) or less.
- Tapes and mastics (dry) should have a UL 723 rating of 25 flame spread, 50 smoke developed.

Ducts and Plenums

- Use of 3.0 PCF (48 kg/m^3) insulation board in concealed areas is recommended.
- Use of 6.0 PCF (96 kg/m^3) insulation board in exposed areas and outdoor applications is recommended.

Vessels, Tanks and Equipment

- For irregular surfaces, use 1.6 PCF (26 kg/m^3) insulation board and band with minimum compression.
- For outdoor application, Earthwool Insulation Board must be covered with appropriate jacketing, mastic or other vapor retarder. All exposed surfaces must be protected.
- Apply jacketing, mastics and other vapor retarders in accordance with manufacturer's instructions.

Precaution

- During initial heat-up to operating temperatures above 350° F (177° C), a slight odor and some smoke may be given off as a portion of the bonding material used in the insulation begins to undergo a controlled decomposition.
- If natural convection is not adequate in confined areas, forced ventilation should be provided in order to protect against any harmful fumes and vapors that might be generated.

PACKAGING

Vacuum packaging this product will reduce some mechanical properties of the insulation. By ordering vacuum packaged products, the customer acknowledges these reduced properties and assumes responsibility for the fitness for use in their application.

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.

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

Visit **knaufnorthamerica.com** to learn more.

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01-21