KNAUF INSULATION
it's time to save energy

Knauf Data Sheet | PE-DS-2e 4-10

Insulation Board

with ECOSE® Technology

with ECOSE® TECHNOLOGY

Shrinkage (ASTM C 356)

- Less than 0.3% linear shrinkage.

Resists Microbial Growth (ASTM C 1338, G21)

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

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 adhesive, 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 no greater than 12" (457 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/m3) insulation board in concealed areas is recommended.
- Use of 6.0 pcf (96 kg/m3) insulation board in exposed areas and outdoor applications is recommended.
- Insulation Board is not designed to be exposed to the airstream.

VESSELS, TANKS AND EQUIPMENT:

- For irregular surfaces, use 1.6 pcf (26 kg/m3) insulation board and band with minimum compression.
- For outdoor application, Knauf 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.

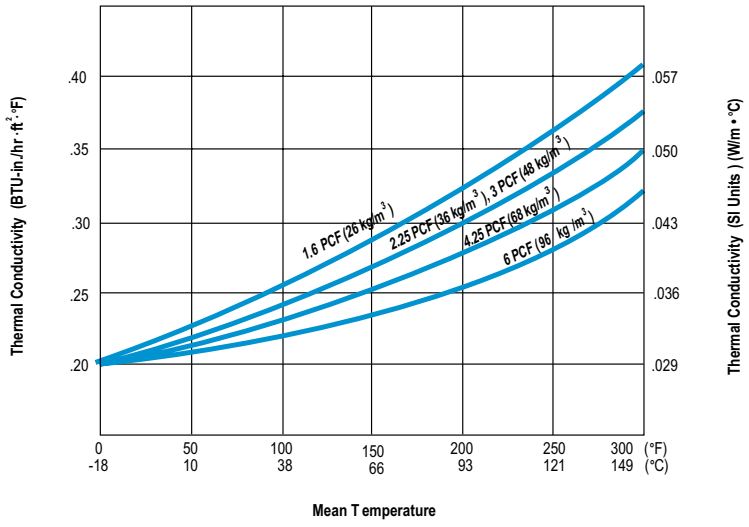
Precaution

- 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.

Caution

Fiber glass may cause temporary skin irritation. Wear long-sleeved, loose-fitting clothing, head covering, gloves and eye protection when handling

Thermal Efficiency (ASTM C 177)



Mean Temperature		1.6 PCF		3.0 PCF		6.0 PCF	
		k	k(SI)	k	k(SI)	k	k(SI)
75°F	(24°C)	.24	.035	.23	.033	.22	.032
100°F	(38°C)	.25	.036	.24	.035	.23	.033
200°F	(93°C)	.33	.048	.29	.042	.27	.039
300°F	(149°C)	.42	.061	.37	.053	.34	.049

Insulation Board *with ECOSE® Technology*

Description

Knauf Insulation Board with ECOSE Technology is a thermal and acoustical insulation product bonded with ECOSE Technology. It is available plain or with a factory-applied FSK facing, PSK (metalized polypropylene-scrim-kraft) or all-service jacket (ASJ).

ECOSE Technology

ECOSE Technology is a revolutionary new binder chemistry that makes Knauf Insulation products even more sustainable than ever. It is based on rapidly renewable bio-based materials rather than non-renewable petroleum-based chemicals traditionally used in fiberglass insulation products. ECOSE Technology reduces binder embodied energy and contains no phenol, formaldehyde, acrylics or artificial colors.

Application

Knauf Insulation Board with ECOSE Technology is a versatile product for thermal and acoustical applications such as: 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 and cavity walls.

Features and Benefits

Energy Conservation

- Excellent thermal efficiency results in lower operating costs.

Low-Cost Installation

- Lightweight, easy to handle and fabricate.
- Fast, easy installation lowers labor costs.

Indoor Air Quality Excellence

- Certified for indoor air quality as a low emitting product by The GREENGUARD Environmental Institute to both the GREENGUARD Certification Program℠ and the more stringent GREENGUARD Children and Schools℠ standard.

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.
- Fiber glass insulation with ECOSE Technology contains three primary ingredients:
  - Sand, one of the world's most abundant and renewable resources
  - Post-consumer recycled bottle glass
  - ECOSE Technology which reduces binder embodied energy by up to 70%
  - It is anticipated to reduce its Global Warming Potential (GWP) by approximately 4%, a significant reduction in our carbon footprint

Noise Reduction

- Excellent acoustical properties effectively reduce noise.

Appearance

- FSK, PSK and ASJ vapor-retardant facings provide a neat finished appearance.

Specification Compliance

In U.S.:

- UL/ULC Classified (FSK, ASJ)
- ASTM C 612
  - – 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 C 795
- MIL-I-24244C
- NRC Reg. Guide1.36. (Certification needs to be specified at time of order)
- ASTM C 1136 (facings)
  - – Type I, II, III, IV (ASJ)
  - – Type II, IV (FSK, PSK)
- California Title 24
- HH-B-100B; Type I (ASJ facing), Type II (FSK, PSK facings)
- 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
- GREENGUARD Indoor Air Quality Certified®

In Canada:

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

Technical Data

Surface Burning Characteristics (UL Classified)

- Unfaced or composite (insulation, facing and adhesive) does not exceed 25 Flame Spread, 50 Smoke Developed when tested in acordance with ASTM E 84, CAN/ULC S102, NFPA 90A and 90B, NFPA 255 and UL 723 (PSK: ASTM E 84 and UL 723 only).

Temperature Range (ASTM C 411)

- Operating temperatures from 0°F to 450°F (-18°C to 232°C).

Corrosiveness (ASTM C 665)

- Will not accelerate corrosion of aluminum, steel or copper.

Corrosion (ASTM C 1617)

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

Puncture Resistance (TAPPI Test T803) (Beach Units)

- FSK, PSK Facings: 25
- ASJ facing: 50

Water Vapor Transmission (ASTM E 96, Procedure A)

- FSK, PSK and ASJ vapor retarders have a maximum vapor transmission rate of .02 perms.

Water Vapor Sorption (ASTM C 1104)

- Less than 5% by weight when exposed to air at 120°F (49°C) and 95% humidity for 96 hours.

Sound Absorption Coefficients (ASTM C 423, 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)	.19	.44	.86	.98	1.00	1.02	.80
		2" (51 mm)	.31	.57	.96	1.04	1.03	1.03	.90
		2½" (64 mm)	.43	.82	1.12	1.07	1.04	1.03	1.00
		3" (76 mm)	.47	.92	1.17	1.06	1.06	1.04	1.05
2.25 PCF (36 kg/m³)	Plain	1" (25 mm)	.05	.24	.59	.86	.97	1.00	.65
		1½" (38 mm)	.17	.49	.93	1.03	1.03	.99	.85
		2" (51 mm)	.26	.62	1.05	1.07	1.04	1.05	.95
	FSK	1" (25 mm)	.14	.69	.81	.99	.55	.27	.75
		2" (51 mm)	.63	.76	1.11	.75	.42	.22	.75
3.0 PCF (48 kg/m³)	Plain	1" (25 mm)	.08	.23	.62	.88	.96	.99	.65
		1½" (38 mm)	.09	.39	.89	1.03	1.06	1.01	.85
		2" (51 mm)	.29	.65	1.11	1.13	1.06	1.03	1.00
		3" (76 mm)	.54	1.01	1.18	1.07	1.07	1.04	1.10
		4" (102 mm)	.95	1.11	1.17	1.07	1.07	1.06	1.10
	FSK	1" (25 mm)	.21	.63	.84	.93	.51	.22	.75
		1½" (38 mm)	.45	.60	.99	.73	.53	.27	.70
		2" (51 mm)	.67	.77	.93	.74	.47	.28	.75
	ASJ	1" (25 mm)	.15	.71	.65	.82	.41	.16	.65
		1½" (38 mm)	.42	.55	.91	.69	.40	.23	.65
		2" (51 mm)	.75	.71	.80	.66	.41	.24	.65
4.25 PCF (68 kg/m³)	Plain	1" (25 mm)	.06	.24	.69	.99	1.05	1.02	.75
	ASJ	2½" (64 mm)	.75	.63	.63	.62	.41	.25	.55
6.0 PCF (96 kg/m³)	Plain	1" (25 mm)	.05	.26	.77	1.04	1.04	1.03	.80
		1½" (38 mm)	.13	.58	1.01	1.05	1.00	1.01	.90
		2" (51 mm)	.32	.81	1.08	1.06	1.03	1.04	1.00
	FSK	1" (25 mm)	.23	.65	.39	.48	.47	.32	.50
		1½" (38 mm)	.61	.47	.78	.61	.51	.35	.60
		2" (51 mm)	.77	.50	.72	.58	.53	.41	.60
	ASJ	1½" (38 mm)	.60	.46	.62	.48	.47	.31	.50
		2" (51 mm)	.77	.44	.60	.50	.41	.30	.50

Forms Available*				
Density (PCF)	**Thickness**		**R-Value**	**(R-SI)**
1.6 (26 kg/m³)	1½"	(38 mm)	6.3	(1.1)
	2"	(51 mm)	8.3	(1.5)
	2½"	(64 mm)	10.4	(1.8)
	3"	(76 mm)	12.5	(2.2)
	3½"	(89 mm)	14.6	(2.6)
	4"	(102 mm)	16.7	(2.9)
2.25 (36 kg/m³)	1"	(25 mm)	4.3	(0.8)
	1½"	(38 mm)	6.5	(1.1)
	2"	(51 mm)	8.7	(1.5)
	2½"	(64 mm)	10.9	(1.9)
	3"	(76 mm)	13.0	(2.3)
	3½"	(89 mm)	15.2	(2.7)
	4"	(102 mm)	17.4	(3.1)
3.0 (48 kg/m³)	1"	(25 mm)	4.3	(0.8)
	1½"	(38 mm)	6.5	(1.1)
	2"	(51 mm)	8.7	(1.5)
	2½"	(64 mm)	10.9	(1.9)
	3"	(76 mm)	13.0	(2.3)
	3½"	(89 mm)	15.2	(2.7)
	4"	(102 mm)	17.4	(3.1)
4.25 (68 kg/m³)	1"	(25 mm)	4.3	(0.8)
	1½"	(38 mm)	6.5	(1.1)
	2"	(51 mm)	8.7	(1.5)
	2½"	(64 mm)	10.9	(1.9)
6.0 (96 kg/m³)	1"	(76 mm)	4.4	(0.8)
	1½"	(89 mm)	6.7	(1.2)
	2"	(102 mm)	8.9	(1.6)

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

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and applying material. Wash with soap and warm water after handling. Wash work clothes separately and rinse washer. A disposable mask designed for nuisance type dusts should be used where sensitivity to dust and airborne particles may cause irritation to the nose or throat.

Fiber Glass and Mold

Fiber glass 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.

Notes

The chemical and physical properties of Knauf Insulation Board with ECOSE™ Technology represent typical 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. Check with your Knauf Insulation sales representative to assure information is current.

U.S. GREEN BUILDING COUNCIL MEMBER

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.
Credit 4.1 - 4.2 Recycled Content
Credit 5.1 - 5.2 Regional Materials

GREENGUARD Children & Schools Indoor Air Quality Certified

Knauf Insulation Board with ECOSE Technology products are certified for indoor air quality as a low emitting product by The GREENGUARD Environmental Institute to both the GREENGUARD Certification Program℠ and the more stringent GREENGUARD Children and Schools℠ standard.
www.greenguard.org.
The GREENGUARD INDOOR AIR QUALITY CERTIFIED Mark is a registered certification mark used under license through the GREENGUARD Environmental Institute.

FSC Mixed Sources FOR POSITION ONLY