

**Description**

Knauf Insulation Earthwool Insulation Board is a thermal and acoustical insulation product bonded with ECOSE Technology. It is available plain or with a factory-applied FSK facing or all-service jacket (ASJ+).

**ECOSE Technology**

ECOSE Technology is a revolutionary binder chemistry that enhances the sustainability of our products. The “binder” is the bond that holds our glass mineral wool product together and gives the product its shape and brown color. ECOSE Technology is a plant-based, sustainable chemistry that replaces the phenol/ formaldehyde (PF) binder traditionally used in glass mineral wool products. Products using ECOSE Technology are formaldehyde-free and have reduced global warming potential when compared to our products of the past.

**Application**

Knauf Insulation Earthwool Insulation Board 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.

**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 accordance with UL 723, ASTM E84, CAN/ULC S102-M88, NFPA 90A and 90B and NFPA 255.

**Temperature Range (ASTM C411)**

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

**Corrosiveness (ASTM C665)**

- Will not accelerate corrosion of aluminum, steel or copper

**Corrosion (ASTM C1617)**

- The corrosion rate in mils/yr will not exceed that of the 5 ppm chloride solution.

**Puncture Resistance (TAPPI Test T803) (Beach Units)**

- FSK facing: 25
- ASJ+ facing: 120

**Water Vapor Transmission (ASTM E96, Procedure A)**

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

**Water Vapor Sorption (ASTM C104)**

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

**Shrinkage (ASTM C356)**

- Less than 0.3% linear shrinkage

**Resists Microbial Growth (ASTM C1338, G21)**

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

**Product Features**

- This product complies with Oregon Revised Statute 453.085 and contains less than 0.10% decabromdiphenyl ether (DecaBDE) by mass.
  - UL GREENGUARD Gold Certified and UL Environment Validated to be formaldehyde-free.
  - Tested and certified to meet all requirements of EUCEB.
  - 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 C795
  - MIL-I-24244C
  - NRC Reg. Guide 1.36. (Certification needs to be specified at time of order)
  - IGCC section 806.6 compliant
  - UL certified recycled content
  - Ingredient disclosure: Declare (unfaced)
  - ASTM C1136 (facings)
    - Type I, II, III, IV (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
- In Canada:
- CAN/ULC S102-M88
  - CGSB 51-GP-10M
  - CGSB 51-GP-52M (facings)

**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.

**Installation**

**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 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.

**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 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.



**UL Environment GREENGUARD Gold**  
 Knauf Insulation achieved UL Environment GREENGUARD Gold Certification.

**UL Environment Validated Formaldehyde Free**  
 Earthwool products are formaldehyde free.

**UL Environment Recycled Content**  
 Earthwool products contain Claim Validated Post Consumer and Pre Consumer recycled content.

For more information, visit [ul.com/spg](http://ul.com/spg).



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

Type	Facing	Thickness	1/3 Octave Band Center Frequency (cycles/sec.)						
			125	250	500	1000	2000	4000	NRC
1.6 PCF (26 kg/m³)	Plain	1 1/2" (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
		2 1/2" (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
		1 1/2" (38 mm)	0.17	0.49	0.93	1.03	1.03	1.03	0.99
		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
		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
		1 1/2" (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
		1 1/2" (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
		2" (51 mm)	0.42	0.55	0.91	0.69	0.40	0.23	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+	2 1/2" (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
		1 1/2" (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
		1 1/2" (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+	1 1/2" (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

**Caution**

Glass mineral wool may cause temporary skin irritation. Wear long-sleeved, loose-fitting clothing, head covering, gloves and eye protection when handling 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. Vacuum packaging Knauf Insulation products 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.

**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.

**Notes**

The chemical and physical properties of Knauf Insulation Earthwool® 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 territory manager to assure information is current.

**Forms Available - R Value\***

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

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

**Thermal Efficiency (ASTM C177)**

