Earthwool™ 1000° Pipe Insulation

with ECOSE® Technology

Submittal Date _____

Description

Knauf Insulation Earthwool™ 1000° Pipe Insulation is a molded, heavy-density, one-piece insulation made from inorganic glass fibers bonded with ECOSE® Technology. It is produced in 3' lengths with or without a factory-applied jacket.

ASJ+ is the newest generation all-service jacket composed of aluminum foil, reinforced with a glass scrim bonded to a kraft paper interleaving with an outer film layer leaving no paper exposed. A matching ASJ+ butt strip is furnished in the carton for each section. The jacket is white, and the longitudinal lap of the jacket has a self-sealing adhesive. The SSL+ Advanced Closure System creates a strong and lasting bond.

Earthwool

Earthwool is the new benchmark that stands apart for its genuine sustainability, unsurpassed performance and consistently high product quality.

ECOSE Technology

ECOSE Technology is a revolutionary binder based on rapidly renewable bio-based materials rather than non-renewable petroleum-based chemicals such as phenol, formaldehyde or acrylics. ECOSE Technology reduces Knauf Insulation's binder embodied energy and contains no phenol, formaldehyde, acrylics or artificial colors found in traditional fiber glass insulation.

Application

Earthwool 1000° Pipe Insulation is used to insulate iron and copper piping in industrial applications and in commercial and institutional buildings. Earthwool 1000° Pipe Insulation is suitable for hot, cold, concealed and exposed piping systems operating at temperatures from 0°F-1000°F (-18°C to 538°C). Additional weather protection is needed outdoors.

Features and Benefits

Energy Conservation

- Offers excellent resistance to heat loss or gain, which saves energy and lowers operating costs
- A low thermal conductivity of .23 at 75°F (24°C)

Low-Cost Installation

- Available with self-sealing lap, which eliminates need for staples, additional material and tools
- Fast, easy installation reduces labor costs

Condensation Control

- Installed properly, the foil vapor retarder and pressure-sensitive lap assure a positive vapor seal.

UL Classified

- All Earthwool 1000° Pipe Insulation, plain or jacketed, meets the fire and smoke safety requirements of most federal, state and local building codes.

Easy Size Identification

- Pipe size, wall thickness and Proto 25/50 rated PVC fitting cover size are printed in a repeat pattern along the longitudinal lap
- Easy identification at job site
- Simplifies restocking

ASJ+ SSL+

- Professional finished appearance — dimple and wrinkle resistant
- Cleanable with a wet cloth and soapy water
- Moisture resistant to intermittent, short duration liquid water exposure, such as precipitation during construction phase
- ASJ+ has substantially less degradation and discoloration when exposed to UV.
- ASJ+ meets ASTM C1136 Type I, II, III, IV, and meets VIII based on the 85% better puncture resistance of ASJ+ (Mullen Burst).
- The SSL+ Advanced Closure System creates a strong and lasting bond.

Indoor Air Quality

- Certified to one of the most stringent product emissions standards in the world, GREENGUARD Children and Schools standard. The product is also verified to be formaldehyde free by The GREENGUARD Environmental Institute.

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.
- Earthwool fiber glass insulation contains three primary ingredients:
  - Sand, one of the world's most abundant and renewable resources
  - A minimum 60% recycled post-consumer glass content and UL Environment verification every 6 months
  - 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

Specification Compliance In U.S.:

- ASTM C 547; Type I, Type IV
- ASTM C 585
- ASTM C 795
- ASTM C 1136 (jackets); Type I, II, III, IV,VIII
- HH-I-558C; Form D, Type III, Class 12; Class 13 (to 1000°F, 538°C)
- GREENGUARD Certification
- GREENGUARD GOLD℠ Certification
- Verified to be formaldehyde free by GREENGUARD Environmental Institute
- NFPA 90A and 90B
- MIL-I-PRF-22344E (except pH requirements)
- MIL-I-24244D
- NRC Reg. Guide 1.36 (certification needs to be specified at time of order)
- This product complies with Oregon Revised Statue 453.085 and contains less than 0.10% decabromdiphenyl ether (DecaBDE) by mass.
- Conforms to Marine Equipment European 1408/13
- USCG 164.109/4/1

In Canada:

- CAN/ULC S102-M88
- CGSB 51-GP-9M
- CGSB 51-GP-52M (jacket)

Technical Data - Earthwool 1000° Pipe Insulation

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 Limitation (ASTM C 411 & ASTM C 447)

- Up to 1000°F (538°C) at a maximum recommended thickness of 6 inches

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 1 ppm chloride solution.

Microbial Growth (ASTM C 1338)

- Does not promote microbial growth

Water Vapor Sorption (ASTM C 1104)

- Less than 0.2% by volume

Linear Shrinkage (ASTM C 356)

- Negligible

Technical Data - ASJ+

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

Specification Compliance

- ASTM C 1136 (jackets); Type I, II, III, IV, VIII

Water Vapor Transmission (ASTM E 96, Procedure A)

- Jacket has a water vapor permeance of .02 perms or less.

Water Vapor Sorption (ASTM C 1104)

- Less than 0.2% by volume

Product Forms and Sizes

Produced in 3' (914 mm) sections:

- For iron pipe from ½" to 24" nominal pipe size (15 mm to 610 mm)
- For copper tube from ⅝" to 6 ⅛" (16 mm to 156 mm)
- Wall thicknesses from ½" to 6" (13 mm to 152 mm) in single layer (for most sizes)
- All insulation inner and outer diameters comply with ASTM C 585.

Packaging

- Four convenient carton sizes for easy ordering, inventory tracking and storage
- Reinforced carton handles for strength and easy lifting
- Bar-coded cartons for accurate shipments and tracking
- Full product range stocked at distributors for fast availability

Precautions

Hot Pipe

- May be installed while the system is in operation, at all temperatures up to 1000°F (538°C)

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Earthwool 1000° Pipe Insulation

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- Knauf Insulation recommends, for insulation thicknesses greater than 6" (152 mm) the temperature must be increased from 500°F (260°C) to maximum temperature at a rate not exceeding 100°F (56°C) per hour.
- 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.
- Care must also be taken when using sealants, solvents or flammable adhesive during installation.
- A maximum of 6" (152 mm) wall thickness is recommended.

Cold Pipe

- Use a continuous vapor retarder on piping operating below ambient temperatures.
- Seal all joints, surfaces, seams and fittings to prevent condensation.
- On below freezing applications, and in high-abuse areas, the ASJ+ jacket shall be protected with a PVC vapor retarding outer jacket. In addition, exposed ends of insulation shall be sealed with vapor barrier mastic installed per the mastic manufacturer's instructions. Vapor seals at butt joints shall be applied at every fourth pipe section joint and at each fitting to isolate any water incursion.
- On chilled water systems operating in high humidity conditions, it is recommended that the same guidelines be followed as listed above for below freezing applications.
- Exterior hanger supports are recommended.

Outside Application

- Do not expose pipe insulation to weather. It must be covered with appropriate jacketing, mastic or vapor retardant adhesives.
- All exposed surfaces must be protected. Proto® Indoor/Outdoor PVC Jacketing is recommended. See Knauf Insulaiton Guide Specifications for recommended PVC jacketing application guidelines.
- Apply jacketing, mastics or vapor retardant adhesives per manufacturer's instructions. For metallic jackets, factory-applied condensate retarders are recommended.

ASJ+ SSL+

- Keep adhesive and contact surfaces free from dirt and water, and seal immediately once adhesive is exposed.
- Apply when ambient and insulation temperatures are between 20°F and 130°F (-6.7°C and 54°C).
- If stored below 20°F or above 130°F, allow insulation cartons to stand within recommended temperature range for 24 hours prior to application.
- Do not store product below -20°F (-29°C) or above 150°F (66°C).
- When using Knauf Insulation's SSL+ Advance Closure System, make sure the longitudinal and circumferential joints are properly sealed by rubbing the closure firmly with a squeegee. Use of staples is not recommended.
- When using Earthwool 1000° Pipe Insulation, the surface temperature of the insulation should be between -20°F and 150°F (-29°C and 66°C) during the life of the insulation.

Fittings and Hangers

- Use Proto 25/50 Rated (ASTM E 84) PVC Fitting Covers, applying PVC fittings per Proto's Data Sheet.
- Fittings should be insulated to same thickness as the adjoining insulation.
- Apply fittings per manufacturer's instructions.
- When required by specification, a hard insert of sufficient length should be used to avoid compression of the insulation.

Additional Precautions

Fiber glass 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. Use a disposable mask/respirator designed for nuisance-type dusts where sensitivity to dust and airborne particles may cause irritation to the nose or throat.

Application Guidelines

Storage

- Protect insulation from water damage or other abuse, welding sparks and open flame.
- Cartons are not designed for outside storage.

Preparation

- Apply only on clean, dry surfaces.
- Pipe or vessel should be tested and released before insulation is applied.

General Guidelines

- All sections should be firmly butted.
- Seal circumferential joint with a minimum 3" (76 mm) wide butt strip.
- Jackets, coating and adhesives should have a comparable F.H.C. rating.
- ASJ+ may be painted. As with traditional ASJ, Knauf Insulation does not encourage the painting of ASJ+ because the application of any paint may change the surface burning characteristics and will void the UL Classification and Knauf Insulation Limited Warranty. Where painting is necessary use common water, oil, or solvent-based paints. All paints should be tested for compatibility and adhesion before use.
- All piping should have continuous insulation.
- Position longitudinal lap downward to avoid dirt and moisture infiltration.
- Do not expose pipe insulation to excessive vibration or physical abuse.
- Faced insulation should not have a facing temperature above 150°F (66°C).

Recommended Thicknesses (ASHRAE 90.1-2010)

The minimum thicknesses are based on ASHRAE 90.1-2010 standards and do not necessarily represent the Economic Thickness of Insulation or the thickness required for proper condensation control. Rather, they serve as minimum recommendations for commercial applications. For recommended Economic Thickness, install according to Knauf Insulation or NAIMA 3E programs or as specified.

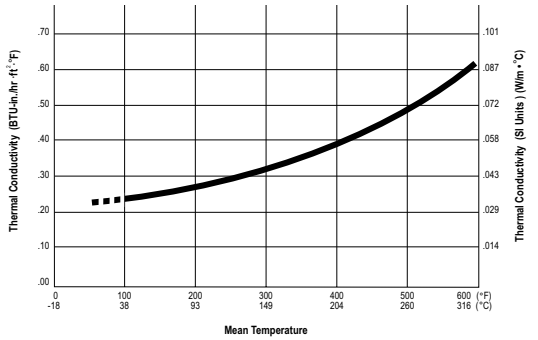
Fiber Glass and Mold

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 Earthwool 1000° Pipe Insulation 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.

Thermal Efficiency (ASTM C 335)



Mean Temperature	k	k (SI)
75°F (24°C)	.23	.033
100°F (38°C)	.24	.035
200°F (93°C)	.28	.040
300°F (149°C)	.34	.049
400°F (204°C)	.42	.061
500°F (260°C)	.51	.074
600°F (316°C)	.62	.089

Insulation Board *with ECOSE® Technology*

Submittal Date _____

KNAUF INSULATION
it's time to save energy

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

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 fiberglass insulation products. This technology reduces binder embodied energy and contains no phenol, formaldehyde, acrylics, or artificial colors.

Application
Knauf 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.

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
- Knauf Insulation achieved UL GREENGUARD Gold Certification and is UL Environment Validated to be formaldehyde free. Products are certified to UL GREENGUARD standards for low chemical emissions into indoor air during product usage.

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 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 reduce noise.

Appearance
- FSK, PSK and ASJ vapor-retardant facings provide a pleasing appearance.

Specification Compliance
In U.S.:
- UL/ULC Classified (Plain, FSK, ASJ)
- ASTM C 612;
  – Type IA (1.6, 2.25, 3.0, 4.25, 6.0 pcf) (26, 36, 48, 68, 96 kg/m^3)
  – Type IB (3.0, 4.25, 6.0 pcf) (48, 68, 96 kg/m^3)
- 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/m^3)
  – Form A, Class 2 (3.0, 4.25, 6.0 pcf) (48, 68, 96 kg/m^3)
- NFPA 90A and 90B

In Canada:
- CAN/ULC S102-M88
- CGSB 51-GP-10M
- CGSB 51-GP-52M (facings)

Technical Data
- 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.

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 E 84; CAN/ULC S102-M88; NFPA 90A and 90B and NFPA 255. PSK faced; ASTM E 84 only.

Temperature Range (ASTM C 411)
- Operating temperatures from 0°F to 450°F (-18°C to 232°C) at a maximum recommended thickness of 4 inches.

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.

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.

Tested and certified to meet all requirements of EUCEB.

Application and 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 polybag.

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 no greater than 12" (305 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:
- Recommend 3.0 pcf (48 kg/m^3) insulation board in concealed areas.
- Recommend 6.0 pcf (96 kg/m^3) insulation board in exposed areas and outdoor applications.
- Insulation Board is not designed to be exposed to the airstream.

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, 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.

with ECOSE® TECHNOLOGY

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CI-IB-SS 03-14

Insulation Board *with ECOSE® Technology*

Submittal Date _____

KNAUF INSULATION
it's time to save energy

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	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

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

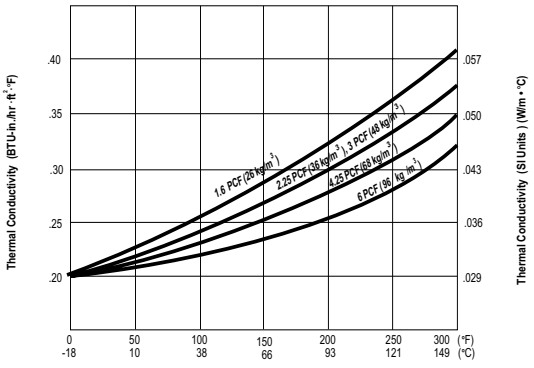
Glass mineral wool insulation will not sustain mold growth. However, mold can grow on almost any material when it becomes wet and contaminated. Carefully inspect any insulation that has been exposed to water. If it shows any sign of mold it must be discarded. If the material is wet but shows no evidence 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 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.

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

Forms Available - R Value*

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)
	3"	(76 mm)	12.5	(2.2)
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)
	3"	(76 mm)	13.0	(2.3)
	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)
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)	4.5	(0.8)
	1½"	(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)

† Cartons only.

Friendly Feel® Duct Wrap

with ECOSE® Technology

Submittal Date _____

Description

Knauf Insulation Friendly Feel® Duct Wrap with ECOSE® Technology is a thermal and acoustical insulation blanket made from highly resilient, inorganic glass mineral wool bonded with ECOSE Technology. It is available unfaced, with a foil-scrim-kraft (FSK) jacket and with a white metalized polypropylene-scrim-kraft (PSK) jacket. Vapor retarders provide a 2" (51 mm) staple flange on one edge, and the factory-applied facing assures uniform quality.

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 fiber glass insulation products. ECOSE Technology reduces binder embodied energy and does not contain phenol, formaldehyde, acrylics or artificial colors.

Application

Knauf Insulation Friendly Feel Duct Wrap is used as external insulation on commercial or residential heating or air conditioning ducts. It is suitable for the exterior of rectangular or round sheet metal ducts and spaces or surfaces where temperature and condensation must be controlled.

Features and Benefits

- Low "k" factor significantly reduces heat gain or loss when applied with proper compression.
- Flexible.
- Lightweight.
- Excellent acoustical properties.
- Tough and resilient.
- Energy conservation, which lowers operating costs.
- System efficiency increases; energy usage/costs decrease.
- Conforms easily to flat or irregular surfaces.
- Rolls allow for faster installation, lower labor costs.
- Reduces sound transmission through the duct wall.
- Assured condensation control when installed at proper thickness using FSK or PSK facings, proper installation and sealed joints, seams and penetrations.
- Resists damage in shipment, and during and after installation.
- Certified for indoor air quality as a low emitting product by UL GREENGUARD to both the UL GREENGUARD Certification and the more stringent UL GREENGUARD Gold Certification; and is UL Environment Validated to be formaldehyde free.

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 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 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%

Specification Compliance

In U.S.:

- ASTM C 1139 - unfaced; Type I, Type II,
  Grade 1 - 0.75 lb/ft^3
  Grade 2 - 1.0 lb/ft^3
  Grade 3 - 1.5 lb/ft^3
- ASTM C 553; Type I, II, III
- ASTM C 1136; Type II
- ASTM C 1290
- UL GREENGUARD GOLD Certified^{SM} and UL Environment Validated to be formaldehyde free.
- HH-I-558C; Form B, Type I, Class 7
- NFPA 90A and 90B

In Canada:

- CAN/ULC S102-M88
- CAN/CGSB-51.11-92

Technical Data

Surface Burning Characteristics

- UL/ULC Classified FHC 25/50 (FSK, Unfaced).
- California Title 24 (installed at 25% compression)
- Unfaced and FSK wrap have a Flame Spread 25 and Smoke Developed 50 when tested in accordance with UL 723, ASTM E 84, CAN/ULC S102-M88 and NFPA 255. PSK wrap has a Flame Spread 25 and Smoke Developed 50 when tested in accordance with ASTM E 84.

Temperature Range (ASTM C 411)

- Faced, can be used on ducts operating up to 250°F (121°C).
- Unfaced, up to 350°F (177°C).

Water Vapor Permeance (ASTM E 96, Procedure A)

- FSK and white PSK facings have maximum water vapor permeance of .02 perms.

Water Vapor Sorption (ASTM C 1104)

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

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.

Mold Growth (ASTM C 1338)

- No growth.

Puncture Resistance (TAPPI Test T803) (Beach Units)

- FSK and PSK: 25
- Tested and certified to meet all requirements of EUCEB.

Application and Specification Guidelines

Storage

- Protect stored insulation from water damage, construction damage and other abuse.
- If stored outside, proper protection from weather conditions should be provided.

Preparation

- Install Knauf Insulation Friendly Feel Duct Wrap over clean, dry sheet metal ducts.
- All sheet metal joints and seams must be sealed to prevent air leakage from the duct.

Application

- Install Knauf Insulation Friendly Feel Duct Wrap with facing to the outside to obtain specified R-value using a maximum of 25% compression.
- Butt all insulation joints firmly together. Longitudinal seam of the vapor retarder must be overlapped a minimum of 2" (51 mm). A 2" (51 mm) tab is provided for the circumferential seam and must be overlapped.
- Where vapor retarder performance is necessary, all penetrations, joints, seams and damage to the facing should be sealed with an FSK, PSK or foil tape or glass fabric and mastic prior to system startup.
- Pressure sensitive tapes should be a minimum of 3" (76 mm) wide and be applied with moving pressure using an appropriate sealing tool. Staples should be outward clinch and placed approximately 6" (152 mm) on center.
- Closure systems should have a 25/50 F.H.C. per UL 723.
- For rectangular ducts over 24" (610 mm) wide, secure the insulation to the bottom side of the duct with mechanical fasteners spaced on 18" (457mm) centers to reduce sag. Care should be taken to avoid overcompressing the insulation with the retaining washer.
- It is neither necessary nor desirable to adhere duct wrap to duct surfaces with adhesive.
- Unfaced Duct Wrap should be overlapped with a minimum of 2" (51 mm) and fastened with 4" (102mm) to 6" (152 mm) nails or skewers placed 4" (102mm) apart or secured with a wire or banding system. Care must be taken to avoid damaging the duct wrap. Refer to diagram for staple stitching and butt-joint method.

Installation Procedures

- Use the table (back) to determine stretch-outs required for the nominal thickness of insulation to limit average compression of the insulation 25% or less.

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 physical properties of Knauf Insulation Friendly Feel Duct Wrap 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.

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www.knaufinsulation.us

AH-SS-5e 04-13

Friendly Feel® Duct Wrap

with ECOSE® Technology

Submittal Date _____

KNAUF INSULATION
it's time to save energy

Check with your Knauf Insulation sales representative to assure information is current.

Insertion Loss (Reduction of Sound Transmitted Through Duct Wall)
(Sound and Vibration Design and Analysis, National Environmental Balancing Bureau, 1994)

Duct Dimensions	Sheet Metal	Duct Wrap: Nominal Thickness	Duct Wrap: Nominal Density	Insertion Loss, dB: 63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz
12" x 12" (305 mm x 305 mm)	24 GA	1½" (38 mm)	.75 PCF (12kg/m³)	.6	.6	.6	.7	7.4	14.2	20.9
24" x 12" (610 mm x 305 mm)	24 GA	1½" (38 mm)	.75 PCF (12kg/m³)	.6	.6	.6	.7	7.4	14.2	20.9
48" x 12" (1219 mm x 305 mm)	22 GA	1½" (38 mm)	.75 PCF (12kg/m³)	.5	.5	.5	.6	7.4	14.1	20.9
24" x 24" (610 mm x 610 mm)	22 GA	1½" (38 mm)	.75 PCF (12kg/m³)	.5	.5	.5	.6	7.4	14.1	20.9
24" x 12" (610 mm x 305 mm)	26 GA	1½" (38 mm)	.75 PCF (12kg/m³)	.8	.8	.8	.8	7.5	14.2	21.0
24" x 8" (610 mm x 203 mm)	26 GA	2" (51 mm)	.75 PCF (12kg/m³)	1.0	1.0	1.0	3.6	10.4	17.1	23.9

Stretch-Outs

Labeled Thickness	Installed Compressed Thickness	Round	Square	Rectangular
1 1/2" (38 mm)	1 1/8" (29 mm)	P+9 1/2" (241 mm)	P+8" (203 mm)	P+7" (178 mm)
2" (51 mm)	1 1/2" (38 mm)	P+12" (305 mm)	P+10" (254 mm)	P+8" (203 mm)
2 3/16" (56 mm)	1 5/8" (42 mm)	P+13" (330 mm)	P+11" (279 mm)	P+8 1/2" (216 mm)
2 1/2" (64 mm)	1 7/8" (48 mm)	P+14 1/2" (368 mm)	P+12 1/2" (318 mm)	P+9 1/2" (241 mm)
3" (76 mm)	2 1/4" (57 mm)	P+17" (432 mm)	P+14 1/2" (368 mm)	P+11 1/2" (292 mm)

P = Perimeter of duct to be installed.

Thermal Efficiency (ASTM C 177)

Mean Temperature	0.75 PCF k	0.75 PCF k (SI)	1.0 PCF k	1.0 PCF k (SI)	1.5 PCF k	1.5 PCF k (SI)
50°F (10°C)	.28	.040	.26	.037	.23	.033
75°F (24°C)	.29	.042	.27	.039	.24	.035
100°F (38°C)	.31	.045	.29	.042	.26	.037
125°F (52°C)	.33	.048	.31	.045	.28	.040
150°F (66°C)	.36	.052	.34	.049	.31	.045
175°F (80°C)	.39	.056	.37	.053	.33	.048
200°F (93°C)	.43	.063	.40	.058	.36	.052

R-Value @ 75ºF Mean Temperature

Density	Thickness	Out-Of Package R-Value	Installed R-Value (at 25% Compression)
.75 PCF (12 kg/m³)	1 1/2" (38 mm)	5.1	4.2
	2" (51 mm)	6.8	5.6
	2 3/16" (56 mm)	7.4	6.0
	2 1/2" (64 mm)	8.5	7.0
	3" (76 mm)	10.2	8.4
1.0 PCF (16 kg/m³)	1 1/2" (38 mm)	5.6	4.5
	2" (51 mm)	7.4	6.0
1.5 PCF (24 kg/m³)	1 1/2" (38 mm)	6.1	4.8
	2" (51 mm)	8.2	6.4

Forms Available

Density	Thickness	Width	Length	Facing
.75 PCF (12 kg/m³)	1 1/2" (38 mm)	48" (1219 mm)	100' (30.48 m)	FSK, PSK, unfaced
	2" (51 mm)		75' (22.86 m)	
	2 3/16" (56 mm)		75' (22.86 m)	
	2 1/2" (64 mm)		75' (22.86 m)	
	3" (76 mm)		50' (15.24 m)	
1.0 PCF (16 kg/m³)	1 1/2" (38 mm)	48" (1219 mm)	100' (30.48 m)	
	2" (51 mm)		75' (22.86 m)	
1.5 PCF (24 kg/m³)	1 1/2" (38 mm)	48" (1219 mm)	75' (22.86 m)	
	2" (51 mm)		50' (15.24 m)	

Condensation Control
Recommended minimum install R-Values for condensation control on flat surfaces. Surface emittance : 0.2 (aged aluminum foil or galvanized sheet metal).

RH %	Operating Temperature: 45°F (7°C) Ambient Temperature (°F) 70	80	90	100	110	55°F (13°C) Ambient Temperature (°F) 70	80	90	100	110	60°F (18°C) Ambient Temperature (°F) 70	80	90	100	110
60	2.2[1]	3.3[1]	4.3[1]	4.3[2]	5.4[3]	1.1[1]	2.2[1]	3.3[1]	3.3[1]	4.3[2]	1.1[1]	1.1[1]	2.2[1]	3.3[1]	4.3[2]
70	3.3[1]	5.4[3]	6.5[4]	7.6[5]	—	1.1[1]	3.3[1]	4.3[2]	6.5[4]	6.5[4]	1.1[1]	1.1[1]	3.3[1]	5.4[3]	6.5[4]
80	7.0[4]	—	—	—	—	3.3[1]	6.5[4]	—	—	—	2.2[1]	3.3[1]	6.5[4]	—	—
90	—	—	—	—	—	—	—	—	—	—	6.5[4]	—	—	—	—

[1] All Duct Wrap products
[2] 0.75 PCF, 2" and greater; 1.0 PCF, 1½" and greater; 1.5 PCF, 1½" and greater
[3] 0.75 PCF, 2" and greater; 1.0 PCF, 2"; 1.5 PCF, 2"
[4] 0.75 PCF, 2½" and greater
[5] 0.75 PCF, 3"

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Product name: Glass Mineral Wool with ECOSE® Technology

Synonyms, trade names: EcoBatt® (Unfaced and Faced) Building Insulation, EcoBatt® QuietTherm® (Unfaced and Faced) Building Insulation, Acoustical/IB Board, Acoustical Board Smooth, Air Duct Board (Atmosphere™, Eclipse®), KB Blanket, Black Acoustical Board, Black Diffuser Board, Condensation Control Blanket, Duct Liner (Atmosphere™ and Sonic XP®), Duct Wrap Faced and Unfaced (Atmosphere™, Friendly Feel®), Earthwool® 1000º Pipe Insulation*, ET Batt*, ET Blanket*, ET Board*, ET Panel*, Equipment Liner M, Everbilt (Unfaced and Faced) Building Insulation, Fabrication Board*, Flexible Duct Material, Guardian (Unfaced and Faced) Building Insulation, Hullboard*, Insulation Board (Faced and Unfaced)*, KF-110*, KFR/ET Range Insulation*, KN Series*, Manufactured Housing Duct Board, Manufactured Housing Insulation, Metal Building Insulation, Metal Building Filler Insulation, Pipe & Tank Insulation*, Earthwool® Redi-Klad® 1000º Pipe Insulation*, Rigid Plenum Liner, Sill Sealer, Wall & Ceiling Liner M
(* See Section 2, 8, 10)

Revision: Date: 2015.04.30

Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Thermal and/or acoustic insulation for use in technical applications, industrial applications and in building construction.

Uses advised against: None known.

Details of the supplier of the safety data sheet

Head Office
Knauf Insulation LLC
One Knauf Drive
Shelbyville
IN 46176-1496
Tel:800 825 4434
sds@knaufinsulation.com
www.knaufinsulation.us

Region: United States, Central & South America's

Emergency telephone number

Emergency telephone: Within United States 24hour: Chemtree Tel: 800 424 9300

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

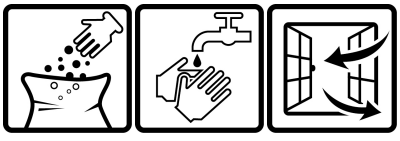
Classification according to the OSHA Hazard Communication Standard (29 CFR 1910.1200)
: The product is not classified.

Label elements

Contains: None.
Hazard pictogram: None.
Signal word: None.
Hazard statement: None.
Precautionary statements:
- Prevention: None.
- Response: None.
- Storage: None.
- Disposal: None.

Supplemental label information: None.

The following sentences and pictograms are printed on packaging: The mechanical effect of fibres in contact with skin may cause temporary itching.



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Other hazards

None.

Hazard summary
Physical hazards: None.
Health hazards: Mechanical irritation of the skin, eyes and upper respiratory system.
Environmental hazards: None.

Main symptoms: Contact with skin, eyes and upper respiratory system may cause mechanical irritation.
Biosoluble glass mineral wool is classified as a nuisance dust by OSHA.

* Heat-Up Precautions: When heated to temperatures above 400ºF for the first time, release of binder components and binder decomposition products can occur which, in high concentrations, may irritate eyes and the respiratory system. - see section 8 & 10

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances

%:	CAS-No.:	Chemical name:	Hazard classification:	Notes:
87-100	-	Biosoluble glass mineral wool	-	(1), (2), (3)
0-13	-	Thermo set, inert polymer bonding agent derived from plant starches	-	(1)

Notes:

(1) Specific chemical identity and/or exact percent concentration is withheld as trade secret.
(2) Man made vitreous (silcate) fibres with random orientation with alkaline oxide and alkali earth oxide (Na2O+K2O+CaO+MgO+BaO) content greater than 18% by weight meeting the requirements of Note Q of European regulation n° 1272/2008 and therefore not classified carcinogenicity.
(3) All Knauf Insulation products covered by this SDS are independently certified by EUCEB to be manufactured using biosoluble glass formulations and thus exempt from labeling under NTP or California Prop 65 requirements.

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General Information:
Show this Safety Data Sheet to the medical professional in attendance. If symptoms occur, follow first aid measures as appropriate.

Notes to Physician: None specific.

Inhalation: Remove from exposure. Rinse the throat and clear dust from airways.

Skin contact: If mechanical irritation occurs, remove contaminated clothing and wash skin gently with cold water and soap.

Eye contact: Rinse abundantly with water for at least 15 minutes.

Ingestion: Drink plenty of water if accidentally ingested.

Most important symptoms and effects, both acute and delayed

Contact with skin, eyes and upper respiratory system may cause mechanical irritation. Biosoluble glass mineral wool is classified as a nuisance dust by OSHA.

Indication of any immediate medical attention and special treatment needed

If any adverse reaction or discomfort continues from any of the above exposures, seek professional medical advice.

Medical attention/treatments: None specific.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Water, foam, carbon dioxide (CO2), and dry powder.

Special hazards arising from the substance or mixture

Products do not pose a fire hazard in use; however, some packaging materials or facings may be combustible. Products of combustion from product and packaging - carbon dioxide, carbon monoxide and some trace gases such as ammonia, nitrogen oxides and volatile organic substances.

Advice for firefighters

In large fires in poorly ventilated areas or involving packaging materials respiratory protection / breathing apparatus may be required.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions:	Minimise direct contact with skin in order to prevent mechanical itching. In dusty environments, use suitable respiratory protection such as 3M 8210, N95 or equivalent. Use glasses or goggles when working with mineral wool insulation above shoulder height or in dusty environments. Where possible, use natural ventilation during installation in order to minimise dust levels. After contact with the product, rinse skin in cold water to reduce potential effects of mechanical itching. Dispose of surplus product in accordance with local regulations.
Emergency procedures:	Use personal protection recommended in Section 8 of the SDS.

Environmental precautions

Not relevant.

Methods and material for containment and cleaning up

In dusty environments, use vacuum equipment where possible to minimise dust levels.

Reference to other sections

For personal protection, see section 8. For waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Assure proper respiratory protection if dust potential exceeds PEL/TLV.

Conditions for safe storage, including any incompatibilities

To ensure optimum product performance; when packaging is removed or opened; products should be stored inside or covered to protect them from ingress of rain water or snow.
Storage arrangements should ensure stability of stacked products and use on a first in first out basis (FIFO) is recommended.

Specific end use(s)

Thermal and/or acoustic insulation for use in technical applications, industrial applications and in building construction.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

United States

Occupational exposure limits:

CAS-No.:	Chemical name:	As:	Exposure limits:	Type:	Notes:	References:
-	Glass wool fibers	-	1 fiber/ml	TWA	A3	ACGIH
-	Particulates not otherwise regulated (PNOR), respirable fraction	-	5 mg/m3	TWA	-	OSHA
-	Particulates not otherwise regulated (PNOR), total dust	-	15 mg/m3	TWA	-	OSHA

Notes: (A3) - Fibers longer than 5 µm; diameter less than 3 µm; aspect ratio greater than 5:1 as determined by the membrane filter method at 400-450X magnification (4-mm objective) phase contrast illumination.
- Biosoluble glass mineral wool fibre - see section 3

Exposure controls

Engineering measures: Maintain sufficient mechanical or natural ventilation to assure fiber concentrations remain below PEL/TLV. Use local exhaust if necessary. Power equipment should be equipped with properly designed dust collection devices.

Eye/face protection: Use glasses or goggles when working with mineral wool insulation above shoulder height or in dusty environments.

Skin protection: Minimise direct contact with skin in order to prevent mechanical itching.

Respiratory equipment: In dusty environments, use suitable respiratory protection.

Hygiene measures: After contact with the product, rinse skin in cold water to reduce potential effects of mechanical itching.

Environmental Exposure Controls: Not relevant.

* Heat-Up Precautions: When heated to temperatures above 400ºF for the first time, release of binder components and binder decomposition products can occur which, in high concentrations, may irritate eyes and the respiratory system. The duration of release is dependant upon the thickness of the insulation, binder content and the temperature applied.Adequate ventilation should be provided. In confined spaces or where ventilation is not possible, occupants should wear appropriate self-contained breathing apparatus.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance:	Solid.
Form:	Rolls., loose fibre, Panel.
Colour:	Brown.
Odor:	Not relevant.
Odor threshold:	Not relevant.
pH:	Not relevant.
Melting point / freezing point:	Not relevant.
Initial boiling point and boiling range:	Not relevant.
Flash point:	Not relevant.
Auto Ignition Temperature (ºF)	Not relevant.
Flammability (solid, gas):	Not relevant.
Flammability limit - lower (%):	Not relevant.
Flammability limit - upper (%):	Not relevant.
Vapor pressure:	Not relevant.
Vapor density:	Not relevant.
Evaporation rate:	Not relevant.
Relative density:	9 - 35 kg/m3
Partition coefficient (n-octanol/water):	Not relevant.
Solubility:	Generally chemically inert and insoluble in water.
Decomposition Temperature (ºF)	Not relevant.
Viscosity:	Not relevant.

Other data:	Nominal diameter of fibres. 3 - 5µm
	Length weight geometric mean diameter less 2 standard errors: < 6 µm
	Orientation of fibres: Random.

SECTION 10: STABILITY AND REACTIVITY

Reactivity

None.

Chemical stability

Binder will decompose above 400ºF

Possibility of hazardous reactions

None.

Conditions to avoid

Heating above 400ºF

Incompatible materials

Incompatible materials: Hydrofluoric acid will react with and dissolve glass.

Hazardous decomposition products

None in normal conditions of use.

* Heat-Up Precautions: When heated to temperatures above 400ºF for the first time, release of binder components and binder decomposition products can occur which, in high concentrations, may irritate eyes and the respiratory system. The duration of release is dependant upon the thickness of the insulation, binder content and the temperature applied.Adequate ventilation should be provided. In confined spaces or where ventilation is not possible, occupants should wear appropriate self-contained breathing apparatus.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Ingestion: Non-hazardous when ingested.
Inhalation: Mechanical irritation to upper respiratory tract.
Skin contact: Mechanical irritation to skin.
Eye contact: Mechanical irritation to eyes.
Symptoms: Contact with skin, eyes and upper respiratory system may cause mechanical irritation.
Biosoluble glass mineral wool is classified as a nuisance dust by OSHA.

Information on toxicological effects:
Acute toxicity: No data were identified for the product as a whole. Data are for constituents:

Product name: Thermo set, inert polymer bonding agent derived from plant starches.
Result - LD50
Species - n/a
Dose - n/a
Exposure - n/a

Product name: Biosoluble glass mineral wool
Result - LD50
Species - n/a
Dose - n/a
Exposure - n/a

Serious eye damage/irritation: May cause mechanical irritation to eyes.
Skin Corrosion/Irritation: May cause mechanical irritation to skin.
Respiratory or skin sensitization: No data were identified for this product or its constituents.
Germ cell mutagenicity: No data were identified for this product or its constituents.
Carcinogenicity: Results from a biopersistence test by intratracheal instillation has shown that fibers in this product longer than 20 µm have a weighted half-life less than 40 days, thus this product is not classified as a carcinogen. None of the components of this product are listed as a carcinogen by OSHA, IARC or NTP.

Reproductive Toxicity: No data were identified for this product or its constituents.
Developmental Effects: No data were identified for this product or its constituents.
STOT - Single exposure: No data were identified for this product or its constituents.
STOT - Repeated exposure: No data were identified for this product or its constituents.
Aspiration hazard: Not relevant.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Ecotoxicity: This product is not ecotoxic to air, water or soil, by composition.

Persistence and degradability

Inert inorganic product with Thermo set, inert polymer bonding agent derived from plant starches; 0 - 13%

Bioaccumulative potential

Will not bio-accumulate.

Mobility in soil

Not considered mobile. Less than 1% leachable organic carbon if landfilled.

Results of PBT and vPvB assessment

Not relevant.

Other adverse effects

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues: Dispose of in accordance with all applicable regulations.

Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.

Disposal methods: This product is not regulated under RCRA Hazardous Waste Regulations. May be disposed in landfill. If unsure, contact the local office of the USEPA, your local public health department or the local landfill regulators.

SECTION 14: TRANSPORT INFORMATION

UN number

Not regulated.

UN proper shipping name

Not regulated.

Transport hazard class(es)

Not regulated.

Packing group

Not regulated.

Environmental hazards

Not regulated.

Special precautions for user

Not regulated.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not regulated.

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

OSHA Status: This product is regulated as a nuisance dust under OSHA criteria. Classified as not hazardous.

TSCA listed: All components of this product are listed or exempt from listing on the TSCA inventory.

CERCLA Reportable Quantity: Not regulated.

SARA Title III:
Section 302 Extremely Hazardous: Not regulated.
Section 311/312 Hazard Categories: Not regulated.
Section 313 Toxic Chemicals: Not listed.

California Safe Drinking Water and Toxic Enforcement Act (Prop. 65): This product is exempt from labeling requirements under this Act.

In accordance with industry practice, Knauf Insulation has decided to continue to provide its customers with the appropriate information for the purpose of assuring safe handling and use of mineral wool throughout the product life.

SECTION 16: OTHER INFORMATION

Label in accordance with OSHA HCS (2012): This product is not classified as hazardous.

Abbreviations and acronyms used in the safety data sheet:
CAS: Chemical Abstract Service
CFR: Code of Federal Regulations
EUCEB: European Certification Board for Mineral Wool Products
IARC: International Agency for Research on Cancer
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration (United States)
PEL: Permissible Exposure Limit
PBT: Persistent, Bioaccumulative and Toxic
SARA: Superfund Amendments and Reauthorization Act
SDS: Safety Data Sheet
STEL: Short Term Exposure Limit
TLV: Threshold Limit Value
TSCA: Toxic Substances Control Act
USEPA: United States Environmental Protection Agency

All products manufactured by Knauf Insulation are made of non-classified fibres and are certified by EUCEB.

Products meeting EUCEB certification requirements can be recognised by the EUCEB logo printed on the packaging.

Further information can be obtained from:
www.euceb.org
www.knaufinsulation.com

Additional information: Change to Sections: New document format

Moreover, in 2001, the IARC, reclassified glass mineral wool fibres from Group 2B (possibly carcinogenic) to «not classifiable as to their carcinogenicity to humans (Group 3)». (See Monograph Vol 81, http://monographs.iarc.fr/).

The information on this data sheet represents our current data and is reliable provided that the product is used under the prescribed conditions and in accordance with the application specified on the packaging and/or in the technical guidance literature. Any other use of the product which involves using the product in combination with any other product or any other process is the responsibility of the user.