



Comparison Guide

K-PL-04 08-06

Industry Product Comparison Guide

Pipe & Equipment Products Cross Reference

	Knauf Insulation	Owens Corning	Johns Manville	CertainTeed	
Pipe Insulation	Knauf Pipe Insulation 1000°F Plain, ASJ, ASJ/SSL	Fiberglas ASJ/SSL-II 850°F Plain, ASJ, ASJ/SSL-II	Micro-Lok 850°F Plain, AP, AP-T Plus		
Fittings	Proto Fitting Covers Indoor/Outdoor 25/50	None	Zeston 2000, 300 Indoor/Outdoor 25/50		
Pipe & Tank Insulation	Knauf KwikFlex™ Pipe & Tank Insulation 850°F PSK, ASJ, FSK	FlexWrap Pipe & Tank Insulation 650°F ASJ	Miro-Flex Pipe & Tank 850°F AP, FSK	Crimp Wrap Pipe & Tank 850°F ASJ, FSK	
	Knauf Pipe & Tank Insulation 850°F ASJ, FSK, Glass Mat				
Duct Wrap	Knauf <i>Friendly Feel</i> ™ Duct Wrap Multi-Purpose .02 Perms Vinyl 1.3 Perms White PSK .02 Perms Black PSK .09 Perms	SOFTR All-Service Duct Wrap FRK .02 Perms	Microlite Duct Wrap Microlite XG Duct Wrap FSK .02 Perms Vinyl 1.3 Perms	SoftTouch Duct Wrap FSK .02 Perms	
Insulation Board	Knauf Insulation Board	700 Series Insulation	800 Series Spin-Glas	Commercial Board	
	1.5 PCF	Plain, FSK, ASJ, PSK	701 Plain	812 Plain, FSK	CB 150 Plain, FSK
	2.25 PCF	Plain, FSK, ASJ, PSK	702 Plain	813 Plain, FSK	CB 225 Plain, FSK, ASJ
	3.0 PCF	Plain, FSK, ASJ, PSK	703 Plain, FRK, ASJ	814 Plain, FSK, AP	CB 300 Plain, FSK, ASJ
	4.25 PCF	Plain, FSK, ASJ, PSK	704 Plain, FRK, ASJ	815 Plain, FSK, AP	
	6.0 PCF	Plain, FSK, ASJ, PSK	705 Plain, FRK, ASJ	817 Plain, FSK, AP	CB 600 Plain, FSK, ASJ
High Temperature Boards & Blankets	E.T. Board 850°F Plain	Insul Quick 850°F Plain	1000 Series Spin-Glas 850°F Plain		
	E.T. Panel 1000°F Plain	TIW Type II 1000°F Plain	Precipitator Spin-Glas 850°F Plain		
	E.T. Blanket 1000°F Plain	TIW Type I 1000°F Plain	Spin-Glas HTB 1000°F Plain		
		SCR Board 1000°F Plain			
Wall Insulation	Knauf Insulation Board	700 Series Insulation	Insul-Shield Wall & Panel	Commercial Board	
	1.0 PCF		I/S 100 Plain		
	1.5 PCF	Plain	701 Plain	I/S 150 Plain, FSK, PSK	CB 150 Plain, FSK
	2.25 PCF	Plain, FSK, ASJ	702 Plain	I/S 225 Plain, FSK, PSK	CB 225 Plain, FSK, ASJ
	3.0 PCF	Plain, FSK, ASJ	703 Plain, FRK, ASJ	I/S 300 Plain, FSK, PSK	CB 300 Plain, FSK, ASJ
	4.25 PCF	Plain, FSK, ASJ	704 Plain, FRK, ASJ		
	6.0 PCF	Plain, FSK, ASJ	705 Plain, FRK, ASJ		CB 600 Plain, FSK, ASJ

Air Handling Products Cross Reference				
	Knauf Insulation	Owens Corning	Johns Manville	CertainTeed
Duct Board	Knauf Air Duct Board-AGM Knauf Air Duct Board-M	EnDuraGold Duct Board	Mat-Faced Mirco-Aire Super Duct RC EnviroAire XG	Ultra Duct Gold ToughGard Duct Board
	EI-475 1" BE & SL, FSK EI-800 1" & 1½" BE & SL, FSK EI-800 2" BE & SL, FSK	475 1" BE & SL, FRK 800 1" & 1½" BE & SL, FRK	475 1" BE & SL, FSK 800 1" & 1½" BE & SL, FSK 800 2" BE, FSK Super-Duct	EI-475 1" BE & SL, FSK EI-800 1" & 1½" BE & SL, FSK EI-800 2" BE, FSK Certa-Duct
Duct Wrap	Knauf <i>Friendly Feel</i>™ Duct Wrap	SOFTR All Service Duct Wrap	Microlite Microlite XG	SoftTouch Duct Wrap
	.75 PCF 1½", 2", 2½", 2½", 3", FSK, PSK .75 PCF 1½", 2", 3" Vinyl .75 PCF 1½", 2" Unfaced 1.0 PCF 1½", 2", FSK, PSK, Unfaced 1.5 PCF 1½", 2", FSK, PSK	.75 PCF 1½", 2", 2.2", 3" FRK, Vinyl, Unfaced 1.0 PCF 1", 1½" Unfaced 1.0 PCF 1½", 2", FRK 1.5 PCF 1½", 2", FRK	.75 PCF 1½", 2", 2.2", 2½", 3" 1.0 PCF 1½", 2" 1.5 PCF 1½", 2" .75 PCF FSK, Vinyl, Plain 1.0 PCF, FSK 1.5 PCF, FSK	.75 PCF 1½", 2", 2½", 2½", 3" FSK, Plain, Vinyl 1.0 PCF 1½", 2", FSK 1.5 PCF 1½", 2", FSK
Export/ West Coast/ Duct Wrap	Knauf Duct Wrap	Unfaced Duct Wrap	Unfaced Microlite	Duct Wrap
	.75 PCF 1", 2" Unfaced	.75 PCF, 2" 1.0 PCF, 1" *Made in Mexico	.75 PCF 1", 1½", 2", 2½", 3" *Made in Corona, CA Only	.75 PCF 1", 2"
Rigid Plenum Liner	Knauf Rigid Plenum Liner	Duct Liner Board	Permacote Linacoustic R-300 Plenum Liner	ToughGard Rigid Liner Board
	3.0 PCF 1", 1½", 2"	3.0 PCF 1", 1½", 2"	1", 1½", 2"	3.0 PCF 1", 1½", 2"
Flexible Duct Liner	Knauf Duct Liner E•M Knauf Textile Duct Liner	QuietR Acoustic Duct Liner	Permacote Linacoustic Standard & HP Linacoustic RC Standard & HP Linatex Textile	ToughGard 2 Textile Liner ToughGard R Rotary Liner
	Knauf Duct Liner—E•M, 1.5 PCF, 1", 1½", 2" 2.0 PCF, ½", 1" Textile Duct Liner, 1.5 PCF, 1", 1½", 2" 2.0 PCF, ½", 1", 1½", 3.0 PCF, ½", 1"	1.5 PCF, 1", 1½", 2" (not AeroMat) 2.0 PCF, ½", 1", 1½", 2" 3.0 PCF, ½", 1"	Standard Linacoustic ½", 1", 1½", 2" Linacoustic HP, 1" Standard Linacoustic RC, ½", 1", 1½", 2" LinaTex ½", 1", 1½"	ToughGard 1.5 PCF, 1", 1½", 2" 2.0 PCF, ½", 1", 1½" 3.0 PCF, ½", 1" ToughGard R 1.5 PCF, 1", 1½", 2" 2.0 PCF, ½"

Pipe & Equipment Products

Pipe Insulation		Knauf Insulation	Owens Corning	Johns Manville
Brand Name		Knauf Pipe Insulation	Fiberglas ASJ/SSL-II	Micro-Lok
Temperature Limit (ASTM C 411)		1000°F	850°F	850°F
Jacket Temperature Limitation		-20°F to 150°F	-20°F to 150°F	150°F
Markings		<ul style="list-style-type: none"> • On Pipe Itself • Date Code • Pipe Size/Wall Thickness • Proto PVC 	<ul style="list-style-type: none"> • On SSL — Release • Pipe Size/Wall Thickness • Date 	<ul style="list-style-type: none"> • On Jacket • Pipe Size/Wall Thickness • Fitting Cover PVC
Closure System		<ul style="list-style-type: none"> • Compac • One Step • Butt Strips & SSL Same Adhesive • 0°F to 130°F 	<ul style="list-style-type: none"> • Morgan Adhesives • Two-Step Closure, Double Sure • Butt Strip • 25°F to 110°F 	<ul style="list-style-type: none"> • Venture • One Step • 15°F to 130°F
Thickness		½", 1", 1½", 2", 2½", 3", 3½", 4", 4½", 5", 6"	½", 1", 1½", 2", 2½", 3", 3½", 4", 4½", 5", 5½", 6"	½", 1", 1½", 2", 2½", 3", 3½", 4", 4½", 5", 6"
Butt Strip		<ul style="list-style-type: none"> • 3" Wide 12.70 OD • 4" Wide over 12.70 OD 	• All 3" Wide	• All 3" Wide
Thermal Conductivity (ASTM C 335)	75°F	.23	.23	.23
	100°F	.24	.24	.24
	200°F	.28	.29	.29
	300°F	.34	.35	.36
	400°F	.42	.43	.45
	500°F	.51	.54	.59
600°F		.62		
Manufacturing Plant		Shelbyville, IN	Newark, OH; Mexico	Defiance, OH; Phenix City, AL
Specification Compliance		<p>ASTM C 547 Type I, Grade A; Type IV, Grade A</p> <p>ASTM C 585 ASTM C 795</p> <p>ASTM C 1136 (jackets) Type I, II, III, IV</p> <p>HH-B-100B (jackets) Type I and II</p> <p>HH-I-558C Form D, Type III, Class 12; Class 13 (to 1000°F, 538°C)</p> <p>MEA 325-83-M (New York City) MIL-I-22344D MIL-I-24244C (ships) NFPA 90A and 90B NRC Reg. Guide 1.36 USCG 164.109/4/0 (Plain, unjacketed only) In Canada: CAN/ULC S102-M88 CCG F1-304 (plain only) CGSB 51-GP-9M CGSB 51-GP-52M (Jacket)</p>	<p>ASTM C 547 Type I ASTM C795 ASTM C 1136 (Jacket) MIL-I-22344D MIL-I-24244C (Ships) MEA 344-83 (New York City) NFPA 90A NRC 1.36 USCG 164.109 (Plain only) UL/ULC</p>	<p>ASTM C 547 Type I ASTM C 1136 (Jacketing) MIL-I-22344D MIL-I-24244C (Defiance material only) MEA 330-85-M (New York City) NFPA 90A NRC 1.36 (Defiance material only) USCG 164.109 (Except ¾" thru 1½" x ½", Plain only)</p>

Pipe Insulation—High Temperature						
		Perlite	Calcium Silicate	Cellular Glass	Mineral Wool	Fiber Glass
Maximum Service Temperature		1200°F	1200°F	900°F (Special Fab)	1200°F	850°F - 1000°F
Thermal Conductivity (ASTM C 335)	200°F	.44	.42	.45	.29	.28–.30
	300°F	.50	.45	.53	.34–.35	.34–.36
	400°F	.56	.48	.62	.39	.41–.45
	500°F	.60–.62	.52	.73	.44–.50	.51–.59
	600°F	.70	.58	—	.51–.60	—
	700°F	.71–.78	.65	—	—	—
Density		12–14 PCF	13.5–15 PCF	8.5 PCF	8.0 PCF	3.5–7.0 PCF
Compressive Strength		70–100 PSI	200 PSI	35 PSI	—	—
Flexural Strength		60–75 PSI	60–95 PSI	80 PSI	—	—
Linear Shrinkage %		<2% length, width <8% thickness	<2%	—	—	Negligible
Water Absorption		.04%	High	Non Absorptive	High	High
Flame/Smoke Rating (ASTM E 84)		0/0	0/0	5/0	5/0	25/50
Corrosion Resistance		ASTM C 610 ASTM C 795 MIL-I-24244C NRC 1.36	ASTM C 533 ASTM C 795 MIL-I-24244C NRC 1.36	ASTM C 552 ASTM C 795 MIL-I-24244C NRC 1.36	ASTM C 547 ASTM C 795 MIL-I-24244C NRC 1.36	ASTM C 547 ASTM C 795 MIL-I-24244C NRC 1.36
Acid Resistance		1 Wk. Exposure— No Effect with 10% Sulphur on Hydrofluoric Acid		Impervious, except for Hydrofluoric Acid		
Block		Yes	Yes (All)	Yes	No	No
Wrap/Panel		Yes	No	No	Yes	Yes
Fitting		Yes	Yes	No	No	Yes
Suppliers		Industrial Insulation Group, Goodtemp	Industrial Insulation Group	Pittsburgh Corning Cell-U-Foam	Industrial Insulation Group, Rock Wool Mfg., Roxul, Fibrex	Knauf Insulation, Johns Manville, Owens Corning

Pipe & Equipment Products

Pipe Insulation—Below Ambient, Dual Temperature						
		Knauf Insulation	Pittsburgh Corning	Armcell	Nomaco	Nomaco
Brand Name		1000°F Pipe Insulation	Foamglas	AP Armaflex	K-Flex	Insul-Tube
Temperature Range		35°F to 1000°F	-450°F to 900°F	-70°F to 220°F	-330°F to 210°F	-70°F to 220°F
Thickness		½", 1", 1½", 2", 2½", 3"	1½" to 6½"	¾", ½", 1"	¾", ½", ¾", 1"	¾", ½", ¾", 1"
Iron Pipe		½" to 24"	½" to 36"	¾" to 6"	½" to 4"	¾" to 8"
Copper Tube		⅝" to 6⅞"	⅝" to 6⅞"		¼" to 2½"	
Applications		Domestic Hot And Cold Srv. Water • Heating Hot Water • Chilled Water • Dual Temperature Piping • Steam/Condensate Lines	• Cold Water Plmg. • Chilled Water • Refrigeration Lines • Hot Water Plmg. • Liquid Htg. • Dual Temp. Piping	• Cold Water Plmg. • Chilled Water • Refrigeration Lines • Hot Water Plmg. • Liquid Htg. • Dual Temp. Piping	• Cold Water Plmg. • Chilled Water • Refrigeration Lines • Hot Water Plmg. • Liquid Htg. • Dual Temp. Piping	• Cold Water Plmg. • Chilled Water • Refrigeration Lines • Hot Water Plmg. • Liquid Htg. • Dual Temp. Piping
Jacket		PVC (High Humidity)	None	None	None	None
Thermal Conductivity	75°F	.23	.29	.27	.25	.28
	100°F	.24	—	.28	—	.29
Water Vapor Permeability		.04	0	.10	0	.10
Flame/Smoke Rating (ASTM E 84)		25/50	25/50	25/50; up to 1½"	25/50; up to 1"	25/50; up to 1"

Fiber Glass Pipe and Tank Insulation						
		Knauf Insulation	Knauf Insulation	Johns Manville	CertainTeed	Owens Corning
Brand Name		Knauf Pipe and Tank	Knauf KwikFlex Pipe & Tank Insulation	Micro-Flex	CrimpWrap	Flexwrap
Temp. Limitation (ASTM C 411)		850°F	850°F	850°F	850°F	850°F
Density		3.0 PCF Nominal	2.5 PCF Nominal	2.5 PCF Nominal	2.5 PCF Nominal	2.5 PCF Nominal
Size		1" x 36" x 48'	1" x 48" x 52'	1" x 36" or 48" x 52'	1" x 48" x 52'	1" x 48" x 52'
		1½" x 36" x 32'	1½" x 48" x 30'	1½" x 36" or 48" x 30'	1½" x 48" x 30'	1½" x 48" x 30'
		2" x 36" x 24'	2" x 48" x 26'	2" x 36" or 48" x 26'	2" x 48" x 26'	2" x 48" x 26'
		2½" x 36" x 19'	2½" x 48" x 20'	2½" x 36" or 48" x 20'	2½" x 48" x 20'	2½" x 48" x 20'
		3" x 36" x 16'	3" x 48" x 18'	3" x 36" or 48" x 18'	3" x 48" x 18'	3" x 48" x 18'
		3½" x 36" x 14'		3½" x 36" or 48" x 15'	3½" x 48" x 15'	
		4" x 36" x 12'		4" x 36" or 48" x 13'	4" x 48" x 13'	
Thermal Conductivity (ASTM C 177)	100°F	.26	.25	.25	.28	.25
	200°F	.35	.32	.32	.33	.32
	300°F	.45	.39	.39	.43	.40
	400°F	.57	.49	.48	.55	.48
	500°F	.75	.61	.58	.74	.58
Compressive Strength (ASTM C 165)		Not Less Than 125 PSF 10% Deformation	25 PSF at 10% Deformation		Not Less Than 20 PSF at 10% Deformation	
Flame Smoke Rating (ASTM E 84)		25/50	25/50	25/50	25/50	25/50
Facing		ASJ, FSK, Glass Mat	ASJ, FSK, PSK	FSK/AP	ASJ, FSK	FSK, PSK
Specification Compliance		ASTM C 795 ASTM C 1136 Type I, II, III, IV (ASJ) Type II, IV (FSK) HH-B-100B (jackets) Type I & II (ASJ), Type II (FSK) HH-I-558C Form A, Class 3 MIL-I-24244C NRC 1.36	UL/ULC Classified (FSK, ASJ) ASTM C 1393 Type I, II, IIIA, IIIB, Category 2 ASTM C 795 MIL-I-24244C NRC 1.36	ASTM C 1393 , Type IIIA	ASTM C 612 Type IA, II ASTM C 1393 Type IIIA, Category 2	ASTM C 1393 Type I, II, III A & B Category 2

Insulation Board				
	Knauf Insulation	Owens Corning	Johns Manville	CertainTeed
Brand Name	Knauf Insulation Board	700 Series Insulations	800 Series Spin-Glas	Commercial Board
Density	1.6 PCF	701–1.5 PCF	812–1.5 PCF	CB 150–1.5 PCF
	2.25 PCF	702–2.3 PCF	814–3.0 PCF	CB 225–2.25 PCF
	3.0 PCF	703–3.0 PCF	815–4.25 PCF	CB 300–3.0 PCF
	4.25 PCF	704–4.2 PCF	817–6.0 PCF	CB 600–6.0 PCF
	6.0 PCF	705–6.0 PCF		
Temperature Limitation	450°F	450°F	450°F	450°F
Size	24" x 48"	24" x 48"	24" x 48"	24" x 48"
Facing	FSK, ASJ, PSK	FRK, ASJ	FSK, ASJ	FSK, ASJ
Thickness	1.6 PCF– 1½", 2", 2½", 3", 3½", 4" 2.25 PCF– 1", 1½", 2", 2½", 3", 3½", 4" 3.0 PCF– 1", 1½", 2", 2½", 3", 3½", 4" 4.25 PCF– 1", 1½", 2", 2½" 6.0 PCF– 1", 1½", 2"	701–1" to 4" (½" Inc.) 702–MTO 703–1" to 4" (½" Inc.) 704–MTO 705–1" to 3" (½" Inc.)	812–1½" to 4" (½" Inc.) 813–1½" to 4" (½" Inc.) 814–1" to 4" (½" Inc.) 815–1" to 2½" (½" Inc.) 817–1" to 2" (½" Inc.)	CB 150– ½" to 4" (½" Inc.) CB 225– 1" to 4" (½" Inc.) CB 300– 1" to 4" (½" Inc.) CB 600– 1", 1½", 2", 3"
Flame/Smoke Rating (ASTM E 84)	25/50	25/50	25/50	25/50
Water Vapor Sorption (ASTM C 1104)	<5% by Weight	<2% by Weight	<5% by Volume	<5% by Weight
Shrinkage (ASTM C 356)	< .3% Linear Shrinkage	Nothing Stated in Data Sheet	None	None
Beach Puncture Resistance (TAPPI Test T803)	PSK, FSK—25 Units ASJ—50 Units	FRK—25 Units ASJ—50 Units	Nothing Stated in Data Sheet	FSK—25 Units ASJ—50 Units
Water Vapor Transmission Rate (ASTM E 96, Procedure A)	PSK, FSK, ASJ .02 Perms Max.	FRK, ASJ .02 Perms	FSK, AP .02 Perms	FSK, ASJ .02 Perms
Specification Compliance	ASTM C 612 Type IA, Type IB 3 PCF, 4.25 PCF, 6 PCF ASTM C 795 ASTM C 1136 (Facing) ASJ—Type I, II, III, IV PSK, FSK—Type II, IV California Title 24 HH-B-100B Type I (ASJ facing), Type II (FSK, PSK facings) HH-I-558C Form A, Class 1 & 2 MIL-I-24244C MEA 324-83-M (New York City) NFPA 90A, 90B NRC Reg. Guide 1.36	ASTM C 553 Type III, Type 701 ASTM C 612 Type IA, Type IB, Type 703, 704, 705 ASTM C 795 ASTM C 1136 (Facing) MIL-I-24244C MEA 277-83 (New York City) Type 703, 705, Plain and FRK NRC Reg. Guide 1.36	ASTM C 553 Type III—812 (Plain only) ASTM C 612 Type IA, IB (Except 812) ASTM C 795 (Cleburne material only) AP—Type I, II; FSK—Type II MIL-I-24244C (Cleburne material only) NFPA 90A, 90B NRC Reg. Guide 1.36 (Cleburne material only)	ASTM C 553 Types I, II, III, CB-150 ASTM C 612 Type IA CB225, CB300, CB600 ASTM C 1136 (Facing) NFPA 90A, 90B Type IB CB300, CB600

Pipe & Equipment Products

Insulation Board					
Thermal Conductivity (ASTM C 177)					
		75°F	100°F	200°F	300°F
Knauf	1.6	.24	.25	.33	.42
	2.25	.23	.24	.30	.38
	3.0	.23	.24	.29	.37
	4.25	.23	.24	.29	.36
	6.0	.22	.23	.27	.34
Owens Corning	701	.24	.26	.35	.46
	702	.23	.24	.31	.41
	703	.23	.24	.30	.38
	704	.23	.25	.31	.39
	705	.23	.25	.30	.37
Johns Manville	812	.24	.26	.34	.47
	813	.23	.24	.32	.41
	814	.23	.24	.30	.38
	815	.22	.23	.28	.36
	817	.22	.23	.27	.32
CertainTeed (ASTM C 518)	150	.25			
	225	.23			
	300	.23			
	600	.22			

Insulation Board											
Acoustical Performance (ASTM C 423) /Sound Absorption Coefficients (Type A Mounting)											
Octave Band Center Frequencies, Hz											
					125	250	500	1000	2000	4000	NRC
Knauf	1.6	PCF	Plain	1½"	.19	.44	.86	.98	1.00	1.02	.80
	1.6	PCF	Plain	2"	.31	.57	.96	1.04	1.03	1.03	.90
	1.6	PCF	Plain	2½"	.43	.82	1.12	1.07	1.04	1.03	1.00
	1.6	PCF	Plain	3"	.47	.92	1.17	1.06	1.06	1.04	1.05
	2.25	PCF	Plain	1"	.05	.24	.59	.86	.97	1.00	.65
	2.25	PCF	Plain	1½"	.17	.49	.93	1.03	1.03	.99	.85
	2.25	PCF	Plain	2"	.26	.62	1.05	1.07	1.04	1.05	.95
	3.0	PCF	Plain	1"	.08	.23	.62	.88	.96	.96	.65
	3.0	PCF	Plain	1½"	.09	.39	.89	1.03	1.06	1.01	.85
	3.0	PCF	Plain	2"	.29	.65	1.11	1.13	1.06	1.03	1.00
	3.0	PCF	Plain	3"	.54	1.01	1.18	1.07	1.07	1.04	1.10
	3.0	PCF	Plain	4"	.95	1.11	1.17	1.07	1.07	1.06	1.10
	4.25	PCF	Plain	1"	.06	.24	.69	.99	1.05	1.02	.75
	6.0	PCF	Plain	1"	.05	.26	.77	1.04	1.04	1.03	.80
	6.0	PCF	Plain	1½"	.13	.58	1.01	1.05	1.00	1.01	.90
	6.0	PCF	Plain	2"	.32	.81	1.08	1.06	1.03	1.04	1.00
	2.25	PCF	FSK	1"	.14	.69	.81	.99	.55	.27	.75
	2.25	PCF	FSK	2"	.63	.76	1.11	.75	.42	.22	.75
	3.0	PCF	FSK	1"	.21	.63	.84	.93	.51	.22	.75
	3.0	PCF	FSK	1½"	.45	.60	.99	.73	.53	.27	.70
	3.0	PCF	FSK	2"	.67	.77	.93	.74	.47	.28	.75
	6.0	PCF	FSK	1"	.23	.65	.39	.48	.47	.32	.50
	6.0	PCF	FSK	1½"	.61	.47	.78	.61	.51	.35	.60
	6.0	PCF	FSK	2"	.77	.50	.72	.58	.53	.41	.60
	3.0	PCF	ASJ	1"	.15	.71	.65	.82	.41	.16	.65
	3.0	PCF	ASJ	1½"	.42	.55	.91	.69	.40	.23	.65
	3.0	PCF	ASJ	2"	.75	.71	.80	.66	.41	.24	.65
	4.25	PCF	ASJ	2½"	.75	.63	.63	.62	.41	.25	.55
	6.0	PCF	ASJ	1½"	.60	.46	.62	.48	.47	.31	.50
	6.0	PCF	ASJ	2"	.77	.44	.60	.50	.41	.30	.50
					125	250	500	1000	2000	4000	NRC
Owens Corning	701 UF	1"		.17	.33	.64	.83	.90	.92	.70	
	701 UF	2"		.22	.87	.98	1.02	.98	1.00	.90	
	703 UF	1"		.11	.28	.68	.90	.93	.96	.70	
	703 UF	2"		.17	.86	1.14	1.07	1.02	.98	1.00	
	705 UF	1"		.02	.27	.63	.85	.93	.95	.65	
	705 UF	2"		.16	.71	1.01	1.01	.99	.99	.95	
	703 ASJ	1"		.17	.71	.59	.68	.54	.30	.65	
	703 ASJ	2"		.47	.62	1.01	.87	.51	.32	.75	
	705 ASJ	1"		.20	.64	.33	.56	.54	.33	.50	
	705 ASJ	2"		.58	.49	.73	.76	.55	.35	.65	
	703 FRK	1"		.18	.75	.58	.72	.62	.35	.65	
	703 FRK	2"		.63	.56	.95	.74	.60	.35	.75	
	705 FRK	1"		.27	.66	.33	.66	.51	.41	.55	
	705 FRK	2"		.60	.50	.63	.82	.45	.34	.60	
						125	250	500	1000	2000	4000
Johns Manville	812	1"		.07	.24	.63	.87	1.00	1.02	.70	
	812	2"		.24	.68	1.10	1.13	1.10	1.07	1.00	
	813	1"		.08	.27	.69	.95	1.05	1.02	.75	
	813	2"		.19	.88	1.15	1.14	1.10	1.07	1.05	
	814	1"		.06	.29	.75	.99	1.04	1.02	.75	
	814	2"		.24	1.00	1.11	1.08	1.06	1.05	1.05	
	815	1"		.03	.32	.80	1.04	1.05	1.05	.80	
	815	2"		.27	.91	1.11	1.09	1.09	1.09	1.05	
	817	1"		.10	.35	.85	1.04	1.05	1.03	.80	
	817	2"		.38	.93	1.10	1.07	1.07	1.07	1.05	
					125	250	500	1000	2000	4000	NRC
CertainTeed	CB 150	1½"		.19	.51	.82	.86	.95	.97	.80	
	CB 150	2"		.23	.61	.94	.97	.98	.96	.90	
	CB 150	2½"		.41	.78	.96	.94	.93	.97	.90	
	CB 150	3"		.41	.94	1.07	1.01	1.00	.97	1.00	
	CB 150	3½"		.60	1.08	1.09	1.02	1.04	1.06	1.05	
	CB 150	4"		.64	1.05	1.07	.97	.96	1.01	1.00	
	CB 225	1"		.06	.30	.68	.85	.91	.94	.70	
	CB 225	1½"		.12	.48	.83	.90	.90	.89	.80	
	CB 225	2"		.22	.63	1.04	1.00	1.00	.97	.90	
	CB 225	2½"		.31*	.81*	1.08*	1.02*	1.04*	1.03*	1.00*	
	CB 225	3"		.34	.95	1.08	.99	.98	.99	1.00	
	CB 225	3½"		.54	1.11	1.12	1.01	1.02	1.00	1.05	
	CB 225	4"		.70	1.15	1.12	.99	1.01	1.08	1.05	
	CB 300	1"		.08	.25	.72	.88	.93	.94	.70	
	CB 300	1½"		.10	.51	.89	.95	.92	.93	.80	
	CB 300	2"		.21	.73	1.08	1.04	1.04	.96	.95	
	CB 300	2½"		.31	.81	1.08	1.02	1.04	1.03	1.00	
	CB 300	3"		.41	.96	1.13	1.03	1.03	1.02	1.05	
	CB 300	3½"		.72	1.14	1.11	1.00	1.02	1.00	1.05	
	CB 300	4"		.75	1.18	1.09	1.00	1.00	1.02	1.05	
CB 600	1"		.05	.27	.78	.97	.97	.91	.75		
CB 600	1½"		.17	.50	.98	1.03	.99	.98	.90		
CB 600	2"		.31	.89	1.07	.99	1.02	.98	1.00		

*Estimated

Pipe & Equipment Products

High Temperature Fiber Glass Blanket					
	Knauf Insulation	Owens Corning	Johns Manville		
Brand Name	Knauf ET Blanket	TIW Type I	Spin Glas HTB 26, HTB 23		
Operating Temperature	to 1000°F	to 1000°F	to 1000°F		
Density (ASTM C 167)	1.1 PCF Nominal	1 PCF Nominal	1.06 PCF (HTB 26), 2.0 PCF (HTB 23)		
Thickness	1", 1½", 2", 2½", 3", 3½", 4"	1", 2", 3", 4"	1"-4" (in ½" Increments)		
Roll Width	48"	24", 48"	24", 36", 48"		
Thermal Conductivity (ASTM C 177)	ASTM C 518				
			HTB 26	HTB 23	
	100°F	.28	.29	.30	.25
	200°F	.38	.39	.40	.31
	300°F	.52	.52	.50	.38
400°F	.70	.70	.65	.49	
500°F	.90	.96			
Flame/Smoke Rating (ASTM E 84)	25/50	25/50	25/50		
Heat Up Cycle Directions	Not Needed	Not Needed	Not Needed		
Applications	Industrial Furnaces Irregular Surfaces Marine Applications Panel Systems	Industrial Ovens Irregular Surfaces Flexible Wrap Panel Systems	Irregular Hot Surfaces		
Specification Compliance	ASTM C 795 HH-I-558C Form B, Class 7, 8 MIL-I-22023D Type I, Class 3 Type II, Class 3 MIL-I-24244C NRC Reg. Guide 1.36 USCG 164.109 In Canada: CAN/ULC S102-M88 CCG F1-314 CGSB 51-GP-11M	ASTM C 553 Type I, II, V ASTM C 795 ASTM C 1139 Type I Grade 2 MIL-I-22023D Type I, II, Class 3 MIL-I-24244C NRC 1.36 USCG 164.109	ASTM C 553 HTB 26, Type V, HTB 23-Type VI ASTM C 795 ASTM C 1139 Type I, Grade 2, HTB 26, Grade 4 HTB 23 MIL-I-22023D Type I, Class 3, HTB 26, Class 5 HTB23 MIL-I-24244C NRC 1.36 USCG 164.109		

High Temperature Fiber Glass Panel				
	Knauf Insulation	Owens Corning	Johns Manville	
Brand Name	Knauf ET Panel	TIW Type II	Precipitator Spin-Glas	
Density (ASTM C 167)	2.4 PCF Nominal	2.4 PCF Nominal	2.4 PCF Nominal	
Thickness	1", 1½", 2", 2½", 3", 3½", 4"	1"–4" (in ½" Increments)	1"–4" (in ½" Increments)	
Size	24" x 48"	24" x 48"	12" x 48"	
	24" x 96"	36" x 48"	24" x 48"	
	48" x 48"	48" x 48"	12" x 96"	
	48" x 96"		24" x 96"	
	48" x 120"			
Thermal Conductivity (ASTM C 177)	(ASTM C 518)			
	100°F	.25	.24	.23
	200°F	.32	.30	.30
	300°F	.40	.37	.33
	400°F	.52	.46	.44
	500°F	.68	.58	.55
Temperature Limit (ASTM C 411)	to 1000°F	to 1000°F	to 850°F	
Water Vapor Absorption (ASTM C 1104)	.1% or Less by Volume	<2% by Weight	—	
Flame/Smoke Rating (ASTM E 84)	25/50	25/50	25/50	
Heat Up Cycle Directions	Not Needed	Not Needed	Needed for Temperatures over 650°F Increase Temp. at 50°F/Hr.	
Maximum Allowable Thickness at 1000°F	Not to Exceed 6"	Not to Exceed 6"	—	
Specification Compliance	ASTM C 612 Type II, III ASTM C 795 HH-I-558C Form A, Class 1, 3 MIL-I-24244C NRC Reg. Guide 1.36 USCG 164.109/18/0 In Canada: CAN/ULC S102-M88 CCG 100/F1-316 CGSB 51-GP-10M DVD 15280-02 E2	ASTM C 553 Types I-VI ASTM C 612 Types IA, II, III ASTM C 795 ASTM C 1139 Type II, Grade 2 MIL-I-24244C NRC 1.36 USCG 164.109	ASTM C 612 Type II ASTM C 795 MIL-I-24244C NRC 1.36 USCG 164.109	
Applications	Precipitators, Ducts Boilers Vessels Industrial Ovens	Metal Mesh Blankets Boilers Vessels Industrial Equipment	Precipitators Ducts Breechings Boilers	

Pipe & Equipment Products

High Temperature Fiber Glass Board					
		Knauf Insulation	Owens Corning	Owens Corning	Johns Manville
Brand Name		Knauf ET Board	Insul Quick	SCR Board	1000 Series Spin-Glas
Temperature Range (ASTM C 411)		to 850°F	to 850°F	1000°F	to 850°F
Density		2.8 PCF Nominal	3.0 PCF Nominal	2.8 PCF Nominal	3.0 PCF Nominal
Thickness		1"-4" (in ½" Increments)	1"-4" (in ½" Increments)	2"-8" (in 1" Increments)	1"-4" (in ½" Increments)
Thermal Conductivity (ASTM C 177)	100°F	.25	.24	.24	.23
	200°F	.33	.30	.30	.28
	300°F	.40	.37	.37	.33
	400°F	.49	.46	.46	.40
	500°F	.57	.58	.58	.50
Applications		Boiler Walls Hot Precipitators Hot Ductwork Cylindrical Tanks Towers Stacks Industrial Ovens	Power & Process Boilers Breechings Ducts Precipitators Chimney Liners Heating Equipment	Selective Catalytic Reduction Units	Precipitators Ducts Breechings Power Generation Plants
Water Vapor Sorption (ASTM C 1104)		<1% by Volume	<2% by Weight	<2% by Weight	Maximum 1% by Volume
Flame/Smoke Rating (ASTM E 84)		25/50	25/50	25/50	25/50
Specification Compliance		ASTM C 612 Type IA, IB, II ASTM C 795 HH-I-558C (Amend. 3) Form A, Class 1, 2, 3 MIL-I-22023D Type III MIL-I-24244C NRC Reg. Guide 1.36 USCG 164.109/15/0 In Canada: CAN/ULC S102-M88 CCG F1-315 CGSB 51-GP-10M	ASTM C 612 Type IA, IB, II ASTM C 795 MIL-I-24244C NRC 1.36 USCG 164.109	ASTM C 612 Type IA, IB, II, III	ASTM C 612 Type II ASTM C 795 MIL-I-22023D Type I, II, Class 6 MIL-I-24244C NRC 1.36 USCG 164.109

Air Handling Products

Air Duct Board				
	Knauf Insulation	Owens Corning	Johns Manville	CertainTeed
Brand Name	Knauf Air Duct Board-AGM Knauf Air Duct Board-M	Duct Board/EnDura Gold EnDuraCoat	Mat-faced Micro-Aire Super Duct RC EnviroAire XG	Ultra Duct Gold Toughgard/Ultra* Duct
Product	EI-475 EI-800	EI-475 EI-800 EI-1400	EI-475 EI-800	EI-475 EI-800
Facing	FSK	FRK	FSK	FSK
Edge/Thickness	Shiplap* 1", 1½" 2" Butt Edge 1", 1½", 2"	Shiplap* 1", 1½" Butt Edge 1" EI-1400 2"	Shiplap* 1", 1½" Butt Edge 1", 2"	Shiplap* 1", 1½" Butt Edge 1", 1½", 2"
Width	48"	48"	48"	48"
Length	96", 120"	96", 120"	96", 120"	96", 120"
Manufacturing Plant	Shelbyville, IN	Waxahachie, TX	Cleburne, TX	Mountaintop, PA
Manufacturing Process	Rotary	Rotary	Rotary	Rotary
Maximum Temperature	250°F	250°F	250°F	250°F
Maximum Velocity	5000 FPM/5000 FPM	6000 FPM	5000 FPM /6000 FPM RC/XG	5000 FPM
Maximum Internal Pressure	+2" W.G.	+2" W.G.	+2" W.G.	+2" W.G.
C-Value at 75°F Mean Temperature	1" = .23 1½" = .15 2" = .12	1" = .23 1½" = .15	1" = .23 1½" = .15 2" = .12	1" = .23 1½" = .15 2" = .12
R-Value at 75°F Mean Temperature	1" = 4.3 1½" = 6.5 2" = 8.7	1" = 4.3 1½" = 6.5 2" = 8.7	1" = 4.3 1½" = 6.5 2" = 8.7	1" = 4.3 1½" = 6.5 2" = 8.7
UL-181 Class I Rigid	Yes	Yes	Yes	Yes

NOTE: Use Approved UL 181A closure materials: UL181A-I(P) pressure sensitive tapes; UL-181A-II(H) heat sealable tapes; UL181A-III(M) mastics.
* Molded Male/Female

Advantages of Air Duct Board over Sheet Metal in a Low Pressure System

1. Thermal performance assured through factory controlled molded thickness.
2. Less leakage, 6% maximum generally much less (~ 1%).
3. No expansion or contraction.
4. Sound absorption excellent.
5. Has a built-in vapor retarder.
6. Easier and quicker to fabricate.
7. Light weight.
8. Easier to handle and ship.
9. Life expectancy in excess of 35 years.
10. Self-insulating. No warm-up time required.
11. Coefficient of friction less than sound lined duct.
12. Alterations can easily be made in the shop or field, causing less waste.
13. Machinery and tools cost less than sheet metal machinery and tools.
14. Less shop space is required.
15. Costs 6% less than conventionally fabricated uninsulated metal duct work.
16. Costs 39% less than sound lined duct or externally insulated metal duct.
17. Shop productivity on average is twice that of metal duct.
18. Average field man-hours is 10-15% less than metal installation.

Application Limitations of Fiber Glass Duct Board

Air Duct Board should not be used in the following applications:

1. Outdoors or where it can get wet.
2. Equipment rooms where severe mechanical abuse can occur.
3. In concrete or buried below grade.
4. Above 250°F, or for moisture exhaust systems.
5. In kitchen or corrosive fume exhaust ducts.
6. To convey solids or corrosive gases.
7. With coal or wood fueled equipment.
8. As casings and/or housing of built-up equipment.
9. Vertical rises more than two stories in height.
10. For velocities or pressures beyond manufacturer's recommendations.
11. To connect to equipment, such as fans, without a starting collar.
12. Not closer than 2" to electric heating coils.
13. In systems supplying hospital sensitive areas such as surgical sites, maternity wards, intensive care units and isolation areas without adequate filtration.
14. Should not be left exposed inside schools or public buildings where possible abuse may occur.
15. Closure must be installed according to UL 181A and manufacturer's recommendations.

Fiber glass duct board is in every way equal or superior to sheet metal. However, it can be prone to certain problems, not caused by poor quality duct board or tape, which include misapplication of the tape, use of improper reinforcements, or use of incorrect hanger supports

Air Handling Products

Duct Wrap												
	Knauf Insulation			Owens Corning			Johns Manville			CertainTeed		
Brand Name	Knauf <i>Friendly Feel™</i> Duct Wrap			SOFTR All Service			Microlite Microlite XG			Soft Touch Duct Wrap		
Density	.75	1½"	5.1/4.2	.75	1½"	5.0/4.2	.75	1½"	5.2/4.2	.75	1½"	5.4/4.2
Thickness	.75	2"	6.8/5.6	.75	2"	6.7/5.6	.75	2"	6.9/5.6	.75	2"	7.1/5.6
Out of Package R-Value/ Installed R-Value (25% compression)	.75	2 ⁹ / ₁₆ "	7.4/6.0	.75	2.2"	7.4/6.0	.75	2 ¹ / ₃ "	8.0/6.5	.75	2 ¹ / ₈ "	7.5/6.0
	.75	2½"	8.5/7.0	.75	3"	10.0/8.3	.75	3"	10.3/8.3	.75	2¼"	8.0/6.5
	.75	3"	10.2/8.4	1.0	1½"	5.6/4.5	1.0	1½"	5.6/4.5	.75	2½"	8.9/7.0
	1.0	1½"	5.6/4.5	1.0	2"	7.4/6.0	1.0	2"	7.4/6.0	.75	3"	10.7/8.5
	1.0	2"	7.4/6.0	1.5	1½"	6.0/4.8	1.5	1½"	6.0/4.7	1.0	1½"	5.8/4.5
	1.5	1½"	6.1/4.8	1.5	2"	8.0/6.4	1.5	2"	8.0/6.3	1.0	2"	7.7/6.1
	1.5	2"	8.2/6.4							1.5	1½"	6.2/4.8
										1.5	2"	8.3/6.4
Facing	FSK, PSK, Vinyl			FRK, Vinyl			FSK, Vinyl			FSK, Vinyl		
Perm Rating (Not To Exceed)	.02 Perms FSK, White PSK .09 Perms Black PSK 1.3 Perms Vinyl			.02 Perms FRK 1.3 Perms Vinyl			.02 Perms FSK 1.3 Perms Vinyl			.02 Perms FSK 1.3 Perms Vinyl		
Manufacturing Plant	Shelbyville, IN Lanett, AL Shasta Lake, CA			Mexico Waxahachie, TX Santa Clara, CA (Unfaced)			Cleburne, TX Defiance, OH			Athens, GA Mountaintop, PA Chowchilla, CA (Faced & Unfaced)		
Manufacturing Process	Rotary			Rotary			Rotary			Rotary		
Maximum Operating Temperature	250°F Faced 350°F Unfaced			250°F Faced 350°F Unfaced			250°F Faced 350°F Unfaced			250°F Faced 350°F Unfaced		
25 Flame Spread 50 Smoke Developed ● per ASTM E 84 ● per UL-723	Yes Yes			Yes No (Available on special request—MTO basis only)			Yes No (Available on special request—MTO basis only)			Yes Yes		
ASTM C 1136 Type II (Replaces HH-B-100B, Type II)	Yes			Yes			Yes			Yes		
	Nominal THK		Installed THK	Round		Square		Rectangular				
Duct Wrap Stretch-Outs	1½"		1 ¹ / ₈ "	P+9½"		P+8"		P+7"				
	2"		1½"	P+12"		P+10"		P+8"				
	2 ⁹ / ₁₆ "		1 ⁵ / ₈ "	P+13"		P+11"		P+8½"				
	2½"		1 ⁷ / ₈ "	P+14½"		P+12½"		P+9½"				
	3"		2¼"	P+17"		P+14½"		P+11½"				

(25% Compression)

Rigid Plenum Liner				
	Knauf Insulation	Owens Corning	Johns Manville	CertainTeed
Brand Name	Knauf Rigid Plenum Liner	Duct Liner Board	Permacote Linacoustic R-300	Toughgard Rigid Liner Board
Density	3.0 PCF	3.0 PCF	3.0 PCF	3.0 PCF
Thickness	1", 1½", 2"	1", 1½", 2"	1", 1½", 2"	1", 1½", 2"
Coating	Black Polymer Overspray	Black Acrylic	Black Acrylic Polymer	Black Acrylic
Facing	—	—	Black Coated Mat	—
Manufacturing Plant	Shelbyville, IN	Newark, OH	Defiance, OH	Corbin, KY
Manufacturing Process	Rotary	Rotary	Rotary	Rotary
Maximum Service Temperature	250°F	250°F	250°F	250°F
Maximum Velocity	5000 FPM	4000 FPM	5000 FPM	6000 FPM
UL-723, NFPA 255, E 84	25/50	25/50	25/50	25/50
R-Value at 75°F Mean Temperature	1"—4.3 1½"—6.5 2"—8.7	1"—4.3 1½"—6.5 2"—8.7	1"—4.3 1½"—6.3 2"—8.4	1"—4.3 1½"—6.5 2"—8.7
C-Value at 75°F Mean Temperature	1"—.23 1½"—.15 2"—.11	1"—.23 1½"—.15 2"—.12	1"—.23 1½"—.15 2"—.12	1"—.23 1½"—.15 2"—.12

Duct Liner				
	Knauf Insulation	Owens Corning	Johns Manville	CertainTeed
Brand Name	Knauf Duct Liner E•M Knauf Textile Duct Liner	QuietR™ Acoustic Duct Liner	Permacote Linacoustic, Standard & HP Linacoustic RC Standard & HP LinaTex Textile	Toughgard 2 Textile Toughgard R
Density, Thickness	1.5 PCF, 1", 1½", 2" 2.0 PCF, ½", 1", 1½" 3.0 PCF*, ½", 1" *Textile Only	1.5 PCF, 1", 1½", 2" 2.0 PCF, ½", 1", 1½", 2" 3.0 PCF, ½", 1" 4.2 PCF, 1" 6.0 PCF, 1½" 8.0 PCF, 2"	Permacote Standard, ½", 1", 1½", 2" Linacoustic HP, 1" Linacoustic RC Standard, ½", 1", 1½", 2" Linacoustic RC HP, 1" LinaTex ½", 1", 1½"	1.5 PCF, 1", 1½", 2" 2.0 PCF, ½", 9/16", 1", 1½", 2" 3.0 PCF*, ½", 1", 1½", 2" *Textile Only
Facing (Black)	Non-Woven Mat	Non-Woven Mat	Mat Faced Woven Mesh with Overspray	Toughgard 2 Non-Woven Mat
Coating (Black)	—	—	Permacote Acrylic Surface	Toughgard R, Composite
Blanket Color	Gray-Black Brown	Black	Purple	Black
Manufacturing Plant	Shelbyville, IN	Newark, OH	Cleburne, TX; Defiance, OH	Sherman, TX
Manufacturing Process	Rotary, Textile— Virgin & Scrap	Textile— Virgin & Scrap, Rotary Scrap	Flame Attenuated Pot and Marble LinaTex—Textile	Toughgard, Textile— Virgin & Scrap Toughgard R, Rotary
Maximum Service Temperature	250°F	250°F	250°F	250°F
Maximum Velocity	6000 FPM	6000 FPM	6000 FPM	6000 FPM
UL 723, NFPA 255, E 84	25/50	25/50	25/50	25/50

Air Handling Products

Duct Liner Performance Comparisons

Knauf Duct Liner E-M vs. Knauf Insulation, CertainTeed & Owens Corning Textile Fiber Glass Duct Liners

Sound Absorption Coefficient Comparison

Octave Band Center Frequencies, Hz

Manufacturer	Type		125	250	500	1000	2000	4000	NRC*
Knauf	1.5 PCF	1"	.18	.36	.59	.86	.95	.90	.70
Knauf Textile	1.5 PCF	1"	.09	.31	.55	.72	.86	.93	.60
CertainTeed	1.5 PCF	1"	.10	.28	.50	.70	.82	.83	.60
Owens Corning	1.5 PCF	1"	.08	.25	.49	.72	.86	.91	.60
Knauf	2.0 PCF	½"	.09	.14	.40	.60	.73	.82	.45
Knauf Textile	2.0 PCF	½"	.06	.14	.32	.55	.68	.86	.40
CertainTeed	2.0 PCF	½"	.04	.10	.24	.41	.56	.73	.35
Owens Corning	2.0 PCF	½"	.10	.15	.27	.49	.66	.77	.40
Knauf	2.0 PCF	½"	.09	.14	.40	.60	.73	.82	.45
CertainTeed	3.0 PCF	½"	.05	.12	.29	.51	.68	.80	.40
Owens Corning	3.0 PCF	½"	.08	.16	.30	.51	.69	.84	.40
Knauf	1.5 PCF	1"	.18	.36	.59	.86	.95	.90	.70
CertainTeed	3.0 PCF	1"	.05	.25	.57	.78	.87	.89	.60
Owens Corning	3.0 PCF	1"	.07	.26	.54	.85	.96	.90	.65

NOTES:

1. Sound absorption coefficient values shown are based on information taken from current Duct Liner Product Data Sheets available from referenced manufacturers.
 2. All sound absorption coefficient values are based on products being tested in accordance with ASTM C 423. Type A mounting.
- *NRC refers to "Noise Reduction Coefficient" which is a standard rating method used in determining the acoustical efficiencies of insulation products and systems. The NRC is an average of frequencies shown, with the high (4000 Hz) and low (125 Hz) ends of the range omitted.

Thermal Conductance Comparison

Manufacturer	1.5 PCF Density			2.0 PCF Density		3.0 PCF Density	
	1"	1½"	2"	½"	1"	½"	1"
Knauf	.24	.17	.13	.48	.24	*	**
Knauf Textile	.28	.19	.14	.52	.26	.48	.24
CertainTeed	.28	.19	.14	.52	.27	.48	.24
Owens Corning	.26	.17	.13	.50	.25	.46	.23

NOTES:

1. Thermal conductance values (C) shown are based on information taken from current Duct Liner Product Data Sheets available from referenced manufacturers.
 2. All thermal conductance values are based on products being tested in accordance with ASTM C 177 and reflect conductance (C) at 75° F mean temperature.
- *Conductance value (C) for Knauf 3.0 PCF 1½" is not shown because Knauf does not manufacture a 3.0 PCF Duct Liner due to Knauf 2.0 PCF 1½" being equal in thermal performance.
 **Conductance value (C) for Knauf 3.0 PCF 1" is not shown because Knauf does not manufacture a 3.0 PCF Duct Liner due to Knauf 2.0 PCF 1" being equal in thermal performance.

Metal Building Insulation Products

Metal Building Insulation				
	Knauf Insulation	Owens Corning	Johns Manville	CertainTeed
Brand Name	Knauf Metal Building Insulation	Certified R	Microlite 'L'	CertainTeed MBI 202
Thickness R-Value Out of Package	3¼" R-10	3¼" R-10	3¼" R-10	3⅝" R-10
	3½" R-11	3½" R-11	3½" R-11	3¾" R-11
	4¼" R-13	4¼" R-13	4¼" R-13	4⅝" R-13
	5" R-16	5" R-16	5¼" R-16	5¼" R-16
	6" R-19	6" R-19	6¼" R-19	6⅝" R-19
	8" R-25	7½" R-25	(Thickness varies by plant)	
	9½" R-30			
Manufacturing Plant	Shelbyville, IN Lanett, AL Shasta Lake, CA	Newark, OH Kansas City, KS	Winder, GA McPherson, KS Cleburne, TX	Athens, GA Kansas City, MO Chowchilla, CA Brossard, Quebec
Manufacturing Process	Rotary	Rotary	Rotary	Rotary
Maximum Service Temperature	350°F	350°F	350°F	350°F
Specification Compliance	ASTM C 553 Type I, II ASTM C 991 Type I ASTM E 136 NAIMA Standard 202-96 HH-I-558C Form B, Class 6	ASTM C 991 Type I ASTM E 136 NAIMA Standard 202-96	ASTM C 991 Type I ASTM E 136 NAIMA Standard 202-96	ASTM C 665 Type I ASTM C 991 ASTM E 136 NAIMA Standard 202-96

Metal Building Filler Insulation				
	Knauf Insulation	Owens Corning	Johns Manville	CertainTeed
Brand Name	Knauf Metal Building Insulation	Certified R	PEBS Blanket	Commercial Blanket
Thickness R-Value Out of Package	3¼" R-10	3¼" R-10	8" R-10	3½" R-11
	3½" R-11	3½" R-11	9¼" R-30	6¼" R-19
	4¼" R-13	4¼" R-13		8" R-25
	5" R-16	5" R-16		10" R-30
	6" R-19	6" R-19		
	8" R-25	7½" R-25		
	9½" R-30			
Manufacturing Plant	Shelbyville, IN Lanett, AL Shasta Lake, CA	Newark, OH Kansas City, KS	Winder, GA McPherson, KS Cleburne, TX	Athens, GA Kansas City, MO Chowchilla, CA Brossard, Quebec
Manufacturing Process	Rotary	Rotary	Rotary	Rotary
Maximum Service Temperature	350°F	350°F	350°F	350°F
Specification Compliance	ASTM C 553 Type I, II ASTM C 665 Type I ASTM C 991 Type I ASTM E 136 NAIMA Standard 202-96 HH-I-558C Form B, Class 6	ASTM C 991 Type I ASTM E 136 NAIMA Standard 202-96	ASTM C 665 Type I ASTM C 991 Type I ASTM E 136	ASTM C 665 Type I ASTM C 991 ASTM E 136

OEM Products

Uncured Insulation		
	Knauf Insulation	Johns Manville
Brand Name	Knauf Uncured	Manville Uncured
Density	.85 PCF	.60 PCF
	1.00 PCF	.75 PCF
	1.25 PCF	1.00 PCF
	1.50 PCF	1.25 PCF
	1.75 PCF	1.50 PCF
	2.00 PCF	1.75 PCF
	2.25 PCF	2.00 PCF
	2.50 PCF	
Color	Amber and Black	Amber and Black
Manufacturing Plant	Lanett, AL	Defiance, OH Flame Attenuated

General Purpose Insulation														
	Knauf				Owens Corning					Johns Manville				
Brand Name	Knauf KN Series				RA Series					Spin-Glas Appliance & Equipment				
Density K-Value Thickness	Thickness				Thickness					Thickness				
	Item	Den.	K-Value	Rolls	Item	Den.	K-Value	Rolls	Batts	Item	Den.	K-Value	Rolls	Batts
	KN-75	.75 PCF	.28	1½"-6"	RA-26	1.07 PCF	.26	1-4"	¾"-6"	SG28	.85 PCF	.27	1-3"	1-6"
	KN-100	1.0 PCF	.26	1"-6"	RA-24	1.55 PCF	.24	1-2"	¾"-4½"	SG26	1.0 PCF	.26	1-3"	1-6"
	KN-150	1.5 PCF	.24	1"-2"	RA-23	1.95 PCF	.23	—	¾"-3½"	SG25	1.2 PCF	.25	1-3"	1-6"
	KN-200	2.0 PCF	.23	1"-2"	RA-22	2.7 PCF	.22	—	¾"-2½"	SG24	1.5 PCF	.24	1"	1-5"
	KN-250	2.5 PCF	.22	1"-1½"						SG23	1.78 PCF	.24	1"	1-4"
									SG22	2.2 PCF	.23	1"	1-3"	
Manufacturing Plant	Lanett, AL/Rotary				Newark, OH/Rotary					McPherson, KS/Spin Glas				
Maximum Service Tempera-	650°F				650°F					350°F				
Specification Compliance	ASTM C 553 Type I, Type II ASTM C 795 MIL-I-22023D Type I, II, Class 2-5 MIL-I-24244C NRC Reg. Guide 1.36 USCG 164.109/19/0				Various Appliance and Equipment					Various Appliance and Equipment				
Applications	Appliance, Water Heater, HVAC Equipment, Office Panels, Acoustical Baffles. Specified for Industrial, Commercial and Marine				Appliance					Appliance, HVAC Equipment, Water Heater				
Related Products	Amber Blanket				TRS Range, WH, HV26, Jet Cel Acoustical Insulation					Spin Glas Range, Microlite				
Sales Channel	Distributor/Fabricators				Manufacturers, Distributor/Fabricators					Manufacturers, Distributor/Fabricators				

Amber Blanket					
	Knauf Insulation			Johns Manville	
Brand Name	Knauf Amber Blanket			Microlite	
Density/Thickness	Density	Thickness		Density	Thickness
	.75 PCF	1½", 2"		.6 PCF	½"-4"
	1.0 PCF	1", 1½", 2"		.75 PCF	½"-4"
	1.5 PCF	½", ¾", 1", 1½"		1.0 PCF	¼"-3"
	2.0 PCF	½", ¾", 1"		1.5 PCF	¼"-2"
	2.5 PCF	½"		2.0 PCF	¼"-1½"
	All Single Layer			2.5 PCF	¼"-1"
				3.0 PCF	¼"-1"
Manufacturing Plant	Shelbyville, IN/Rotary			Defiance, OH/Flame Attenuated	
Maximum Service Temperature	650°F			350°F	
Specification Compliance	ASTM C 553 Type I, II & III ASTM C 795 HH-I-558C Form C, Type I, Class 6, 7 (Class 8 with upper temperature limitation of 650°F) MIL-I-22023D Type I and II, Class 2-5 MIL-I-24244C NRC Reg. Guide 1.36 USCG 164.109/21/0			MIL-I-24244C	
Applications	Appliance, Automotive, Office Panels, Industrial, Commercial, Marine			Appliance, Sill Sealer (Low Thk/Density), Automotive	
Sales Channel	Distributor/Fabricator			Distributor/Fabricator	

Equipment Liner							
	Knauf Insulation			Johns Manville		Owens Corning	
Brand Name	Knauf Equipment Liner M			Exact-O-Mat		Aeroflex	
Density K-Value Thickness	Density	K-Value	Thickness	Density	Thickness	Density	Thickness
	1.5 PCF	.25	½", ¾", 1" 1½", 2"	.75 PCF	1", 1½", 2"	1.5 PCF	1", 1½", 2"
				1.0 PCF	1", 1½", 2"	2.0 PCF	½", 1", 1½", 2"
	2.0 PCF	.24	½", 1", 1½"	1.5 PCF	½", 1", 1½", 2"	3.0 PCF	½", 1"
2.0 PCF				½", ¾", 1"			
Manufacturing Plant	Shelbyville, IN/Rotary			Defiance, OH/Flame Attenuated		Newark, OH	

KNAUF INSULATION



Knauf Insulation GmbH
One Knauf Drive
Shelbyville, IN 46176

Sales and Marketing (800) 825-4434, ext. 8283

Technical Support (800) 825-4434, ext. 8212

Customer Service (866) 445-2365

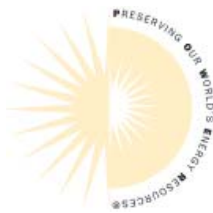
Fax (317) 398-3675

World Wide Web www.KnaufInsulation.com

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NOTES

Knauf Insulation GmbH complies with ISO 9002 in the prevention, detection and correction of problems in production and service areas.



At Knauf, we manufacture a wide variety of products that serve a common goal, helping to make the most of our planet's energy resources. A family-owned global company, we understand and are committed to high standards in quality, performance and environmental responsibility. Every step we take today toward energy conservation helps ensure better lives for generations to come.



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