



KIMMCO

KUWAIT INSULATING MATERIAL
MANUFACTURING CO. S.A.K. (Closed)

ISO 9001, ISO 14001
& OHSAS 18001 CERTIFIED



CLEAN LINER (KCL)



MANUFACTURED
UNDER LICENCE OF
ISOVER
SAINT-GOBAIN

www.kimmcoinsulation.com
www.alghanim.com

A subsidiary of
Alghanim
INDUSTRIES 

CLEAN LINER (KCL)



APPLICATIONS

KIMMCO clean liner is used to line air conditioning ducts, walls and/or ceilings of acoustically sensitive areas to provide efficient sound insulation for any variety of structure, and/or sensitive facilities as home theaters or studios, curtain walls.

DESCRIPTION

KIMMCO clean liner is a highly efficient acoustic material, produced from strong resilient glass fibers firmly bounded together with a thermosetting resin.

STANDARD DIMENSIONS

Thickness	Width	Length	
		Roll	Board
15 mm	1.2 m	20 m	1 m
25 mm	1.2 m	20 m	1 m
40 mm	1.2 m	20 m	1 m
50 mm	1.2 m	20 m	1 m
Other dimensions available			

NOMINAL DENSITY

KCL	kg/m ³	lbs/ft ³
24	24	1.5
32	32	2.0
48	48	3.0
60	60	3.75
72	72	4.5
Other densities available		

FACINGS

KIMMCO clean liner is faced with a black, strong, durable, dimensionally stable woven glass fabric.

FIBER MIGRATION

KIMMCO clean liner achieves zero fiber migration.

THERMAL PERFORMANCE

Tested in accordance with ASTM C518.

Thermal conductivity W/m.K

Mean temperature	KCL 24	KCL 32	KCL 48	KCL 60	KCL 72
0 °C	0.031	0.030	0.029	0.030	0.031
10 °C	0.032	0.031	0.030	0.031	0.033
25 °C	0.035	0.033	0.031	0.032	0.035
50 °C	0.039	0.037	0.035	0.036	0.037
75 °C	0.043	0.040	0.037	0.038	0.040
100 °C	0.047	0.044	0.041	0.042	0.043

Thermal conductivity Btu.in/ft².h.F

Mean temperature	KCL 24	KCL 32	KCL 48	KCL 60	KCL 72
32 °F	0.21	0.20	0.20	0.21	0.21
50 °F	0.22	0.21	0.21	0.22	0.23
77 °F	0.24	0.23	0.22	0.23	0.24
122 °F	0.27	0.25	0.24	0.25	0.26
167 °F	0.30	0.27	0.26	0.26	0.28
212 °F	0.33	0.30	0.29	0.29	0.30

ACOUSTICAL PERFORMANCES

KIMMCO clean liner is especially designed to provide exceptional sound absorption to acoustically sensitive environments and/or equipments as air-conditioning equipments, auditoriums, theatres, studios, acoustical building assemblies, curtain walls.

Product		Absorption coefficient at one third octave band center frequencies (Hz)						
Type	Thickness mm	125	250	500	1000	2000	4000	NRC
KCL 24	25	0.12	0.32	0.70	0.93	0.95	0.99	0.75
	50	0.27	0.69	1.01	1.07	1.06	1.05	0.95
KCL 32	15	0.05	0.13	0.32	0.65	0.79	0.93	0.45
	25	0.29	0.45	0.77	1.00	0.93	0.96	0.80
KCL 48	50	0.37	0.92	1.04	1.14	1.13	1.01	1.05
	15	0.05	0.12	0.29	0.51	0.68	0.80	0.40
KCL 60	25	0.22	0.52	0.73	0.98	1.02	1.00	0.80
	50	0.30	0.85	1.03	1.07	1.06	1.00	1.00
KCL 60	25	0.06	0.19	0.62	0.83	0.90	0.95	0.65
	50	0.21	0.75	1.00	1.00	1.00	0.95	0.95

Test in accordance with ASTM C 423 using Type A mounting as per ASTM E 795. These are typical values subject to normal manufacturing and testing variances.

PHYSICAL PERFORMANCES

Properties	Performances	Test method
Operating temperature limits	Maximum 230 °C	ASTM C 411
Surface burning characteristics (Fire hazard classification)	Flame spread not over 25 Smoke developed not over 50	NFPA 255, UL 723, ASTM E 84
Fire classification	Class 0	BS 476 parts 6 and 7
Water vapor absorption	Not greater than 1% by volume	ASTM C 1104
Fungi resistance Bacteria resistance	Does not breed or promote growth	ASTM C 1071
Air velocity rating	25.4m/s (5,000 ft/minute)	UL 181
Air eroding rating	Nil at 63.5m/s (12,500 ft/minute)	

CONFORMITY TO STANDARDS

KIMMCO clean liner complies with the following standards:

AMERICAN STANDARDS

ASTM 167, 168, 411, 423, 518, 665§ 13.8 & 13.9, 1071, 1101/1101M, 1335, 1338; E 84, 336, 477, 795, 1376 UL 181, 723 F.H. HH-1-545B
NFPA 255, NFPA 90A & 90B
NAIMA standards
SMACNA standards

BRITISH STANDARDS

BS 476 (parts 4&6), 478, 2972, 3533, 3958 (part 5), 5643, 5720

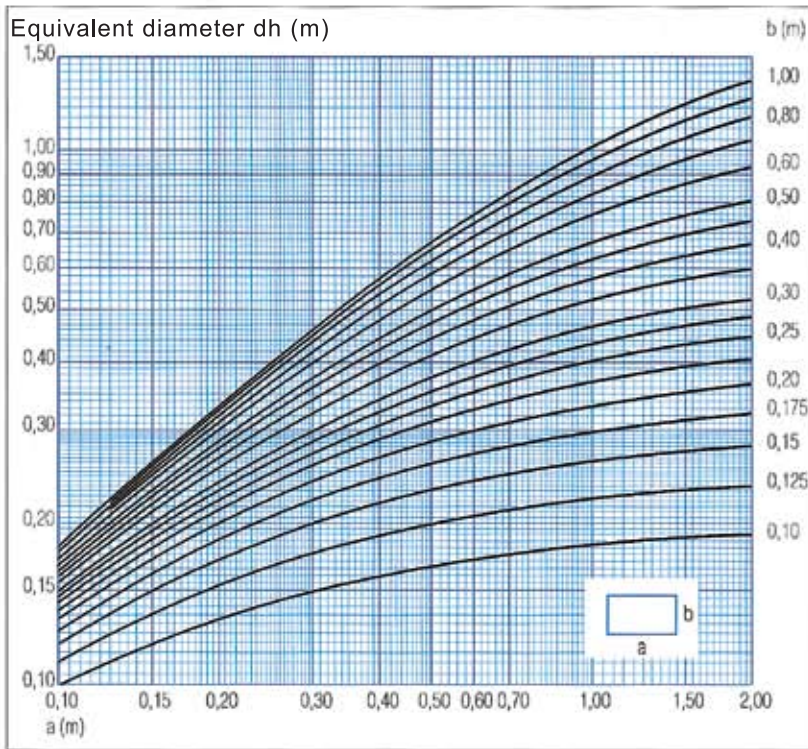
GERMAN STANDARDS

DIN 18165, 52612

ISO

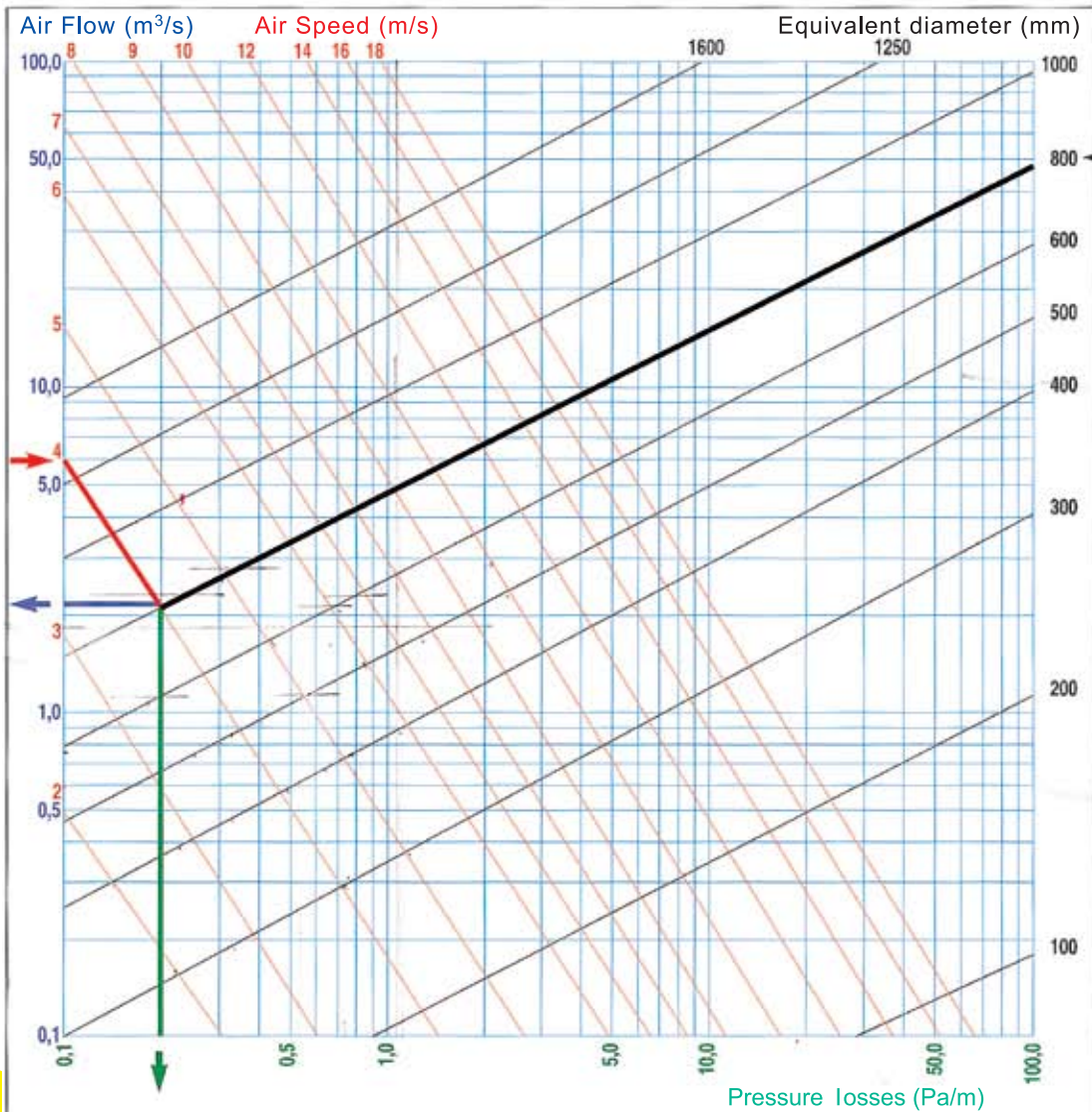
354, 8301, 8302, 9229, 9291

PRESSURE LOSSES



Equivalent diameter

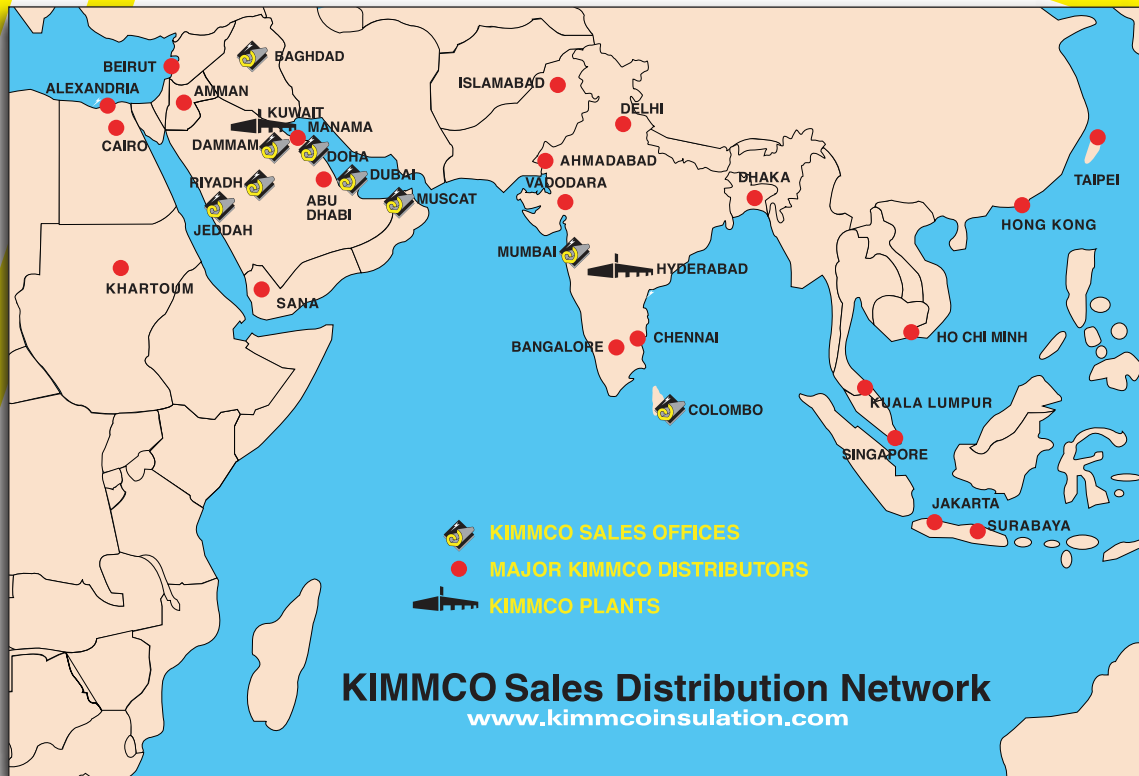
$$d_h = \frac{2(a \times b)}{a + b} \text{ mm}$$



CONVERSION FACTORS

Reference: ASTM E 380

Length	1 in 1 ft	= 25,4 mm = 0,3048 m																																				
Area	1 in ² 1 ft ²	= 645,16 mm ² = 0,0929 m ²																																				
Volume	1 in ³ 1 ft ³ 1 UK gallon (liquid) 1 US gallon (liquid)	= 16387 mm ³ = 0,0283 m ³ = 4,546 liter = 3,785 liter																																				
Mass	1 ounce (av) 1 gr (grain) 1 lb	= 28,3 g = 0,0648 g = 0,4536 kg																																				
Density	1 lb/ft ³ /pcf = 16,018 kg/m ³																																					
Force	1 lbf 1 lbf 1 kPa	= 0,4536 kPa = 0,00445 kN = 0,00981 kN																																				
Temperature	°F = 9/5 °C + 32 °F = 9/5 (°K - 273) + 32 °C = °K - 273																																					
Permeability	1 perm (grain/ft ² h inHg) 1 perm (grain/ft ² h inHg) 1 perm in (grain/in/ft ² h inHg) 1 perm in (grain/in/ft ² h inHg) 1 perm in (grain/in/ft ² h inHg) 1 gram/m h mmHg 1 m ² /h mmH ₂ O	= 0,028 gram mm/m ² h mmHg = 0,00021 gramNh = 17 gram mm/m ² h mmHg = 0,0007 gram/m h mmHg = 0,000005 m/Nh = 0,0075 gram m/Nh = 0,1 m ⁴ /Nh																																				
Energy		<table border="1"> <thead> <tr> <th></th> <th>Btu</th> <th>kcal</th> <th>KJ</th> <th>kWh</th> </tr> </thead> <tbody> <tr> <td>1 Btu =</td> <td>1</td> <td>0,252</td> <td>1,055</td> <td>0,000029307</td> </tr> <tr> <td>1 kcal =</td> <td>3,968</td> <td>1</td> <td>4,187</td> <td>0,001163</td> </tr> <tr> <td>1 kJ =</td> <td>0,9478</td> <td>0,2398</td> <td>1</td> <td>0,000278</td> </tr> <tr> <td>1 kWh =</td> <td>3410</td> <td>860</td> <td>3600</td> <td>1</td> </tr> </tbody> </table>		Btu	kcal	KJ	kWh	1 Btu =	1	0,252	1,055	0,000029307	1 kcal =	3,968	1	4,187	0,001163	1 kJ =	0,9478	0,2398	1	0,000278	1 kWh =	3410	860	3600	1											
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Customer Services

P.O. Box: 10042 Shuaiba, 65451 Kuwait
Phone : (00965) 2 326 2020 Ext. 5339, 5340
Fax : (00965) 2 326 1251, 2 326 2027
Email : kimcsd@alghanim.com

Exports

P.O. Box: 10042 Shuaiba, 65451 Kuwait
Phone : (00965) 2 326 2020 Ext. 5335, 5337
Fax : (00965) 2 326 1251, 2 326 2027
Email : kimexp@alghanim.com

Technical Services

P.O. Box: 10042 Shuaiba, 65451 Kuwait
Phone : (00965) 2 326 2020 Ext. 5310, 5311
Fax : (00965) 2 326 1251, 2 326 2027
Email : kimtech@alghanim.com

Qatar / Oman / Bahrain

P.O. Box: 7943 Doha, Qatar
Phone : (00974) 4995075 / 4995077
Fax : (00974) 4995088
Email : kimmcoqatar@qatar.net.qa

United Arab Emirates - Dubai

P.O.Box: 9207, Dubai, United Arab Emirates.
Tel : (00971) 4 2967660 / 50 6529132
Fax : (00971) 4 2967550
Email : kimmco@emirates.net.ae

Kuwait

P.O. Box: 24609 Safat, 13107 Kuwait
Phone : (00965) 2 473 4439, 2 473 4467,
2 471 0711, 2 474 7096
Fax : (00965) 2 473 4538, 2 473 9789
Email : kusales@alghanim.com

Saudi Arabia - Riyadh

P.O. Box: 63577 Riyadh, 11526 Saudi Arabia
Phone : (009661) 476 3334
Fax : (009661) 476 5731
Email : kirbyriyadh@zajil.net

Saudi Arabia - Jeddah

P.O. Box: 402 Jeddah, 21411 Saudi Arabia
Phone : (009662) 663 1829, 663 1702, 663 1536
663 1361 (Ext. 207, 208, 209)
Fax: : (009662) 661 3620
Email : ngkimmcojed@zajil.net

Saudi Arabia - Dammam

P.O. Box: 2788 Dammam, 31461 Saudi Arabia
Phone : (009663) 833 1678, 832 6488
Fax : (009663) 832 6477
Email : kimmcoem@sahara.com.sa

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