Kaylo Core Product & Application Data

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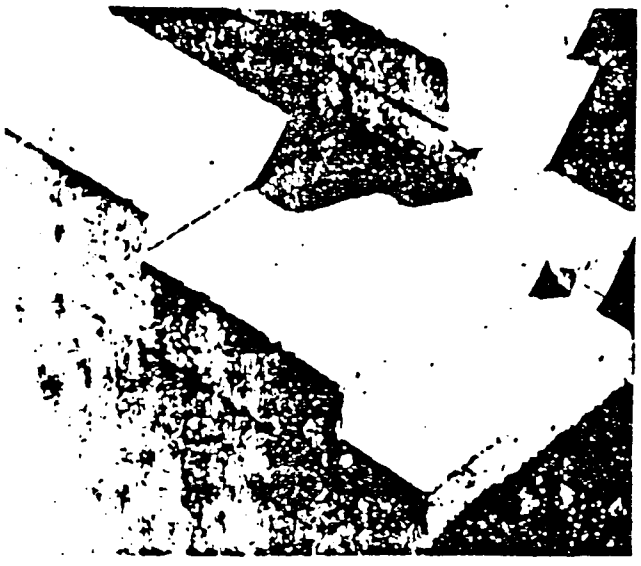

uses

This product is designed for use as a rigid, insulating and fire-resistant structural core material for doors, panels and partitions. Wood, metal and plastic surfacing material can readily be laminated to it.

Sizes		Tol.
Length	36"	−0.+⅛"
Width	18"	−0.+⅛"
Thickness	1½" to 3" (increments of 1/16")	−0.+⅛"

description

Fiberglas* Kaylo* Core Material is a rigid structural hydrous calcium silicate insulating material produced in block or slab form. It is white and has a nominal density of 17 pcf, and a temperature range up to 1800F

benefits

Incombustible material — Kaylo Core will not burn or rot. It is vermin-proof, and resists water and termites and is one of the most efficient structural mineral insulations.

Insulating value — At high mean temperatures its insulating values are equal to materials used only for insulation.

Dimensional stability — Dimensions of Kaylo Core change little with variances in moisture content. Linear shrinkage after heating for one hour in a muffle at 2000F is an average maximum of 0.72%.

Low moisture absorbtion — Kaylo Core absorption characteristics are similar to wood, except there is no warping due to moisture content as with wood. Flexural strength, when wet, is reduced only moderately.

Fire safety — Kaylo Core is completely non-combustible. It has a Flame Spread, Fuel Contributed and Smoke Developed rating of zero, as tested by Underwriters Laboratory Standards for Safety UL-727 which incorporates ASTM-E-84.

Good workability — Kaylo Core is responsive to woodworking tools. It can be sawed with hand or power saw. It can be routed, tongue and grooved, sanded. It can be run through most wood-working equipment, especially if heavy duty cutting edges are used.

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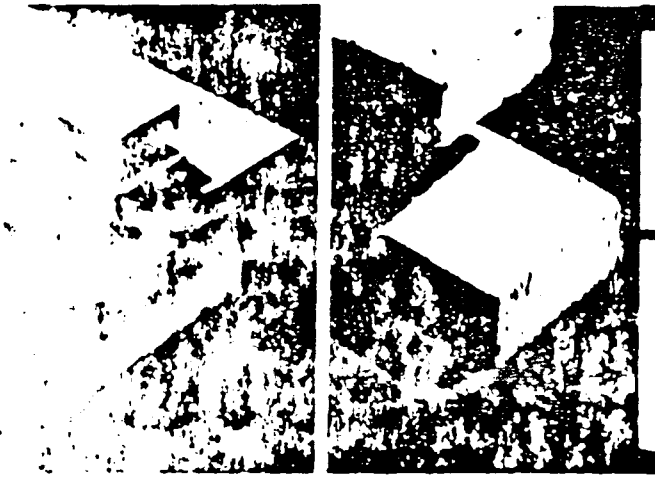
Equipment Insulation



Kaylo & Kaylo 20 Block Insulation

rigid calcium silicate insulations for all types of heated equipment operating at temperatures up to 1800F.

uses

Kaylo® Block is for use on indoor or outdoor equipment operating at temperatures up to 1200F. Kaylo block is especially suited for use on stainless steel vessels and equipment as it helps inhibit stress corrosion cracking. Typical applications are for boilers, breeching, tanks, vessels. Kaylo Block is gray in color.

Kaylo 20® with its high temperature limit of 1800F extends applications to include refractory wall backing for furnaces and boilers and fireproofing of equipment and vessel skirts.

description

Kaylo and Kaylo 20 Block Insulations are rigid hydrous calcium silicate heat insulations reinforced with asbestos fibers. They are strong, efficient and are highly resistant to abrasion and moisture damage. Kaylo 20 has a slightly pink color to distinguish it from Kaylo.

benefits

high thermal efficiency—both Kaylo and Kaylo 20 offer excellent thermal efficiency coupled with high strength. A low k of .40 for Kaylo and .52 for Kaylo 20 at 200F mean temperature proves that Kaylo will provide significant savings in operating costs over the life of the equipment.

resistant to abuse—resists mechanical damage because of hard, tough, reinforced structure.

strong—less breakage in shipment and handling. High temperatures have little effect on strength characteristics.

will not cause stress corrosion cracking—Kaylo will not cause stress corrosion cracking of stainless steel because Kaylo contains less than 200 ppm soluble chlorides as well as an inhibitor which prevents trace quantities of chlorides from the atmosphere or other sources from causing cracking and possible failure of piping and equipment.

resistant to moisture damage—unlike many other insulations, Kaylo is not affected appreciably from moisture damage. It regains thermal efficiency and strength after drying out. Outdoor installations must be weatherproofed, however, for long continuous service.

dimensionally stable—Kaylo does not shrink appreciably in service, even at elevated temperatures. This means less heat leakage at the joints. And Kaylo will not warp or crack in service.

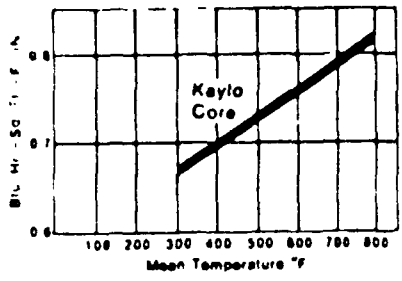
fabricates easily—ordinary insulators tools are all that is required to fabricate Kaylo. It cuts with a clean true edge for tighter fit at the joints. Fittings are neater, faster.

Fiberglas is a registered trademark (Reg. U.S. Pat. Off.) of Owens-Corning Fiberglas Corp.

Performance characteristics

compressive strength:	Above 400 psi at 10% deformation ± 50 psi tolerance
flexural strength:	Above 157 psi, ± 25 psi
moisture content: (factory produced):	reading between 7% — 15% in a moisture detector such as "Delmhorst G-2". maximum 10% by weight
dimensional stability:	2.0% maximum linear shrinkage after heating for 24 hours in muffle at 1800F.
fire hazard classification:	Underwriters Laboratory ASTM-E 84
flame spread	0
fuel contributed	0
smoke developed	0

thermal conductivity:





Kaylo Core is readily cut with portable power saw.



It can be processed with woodworking equipment.



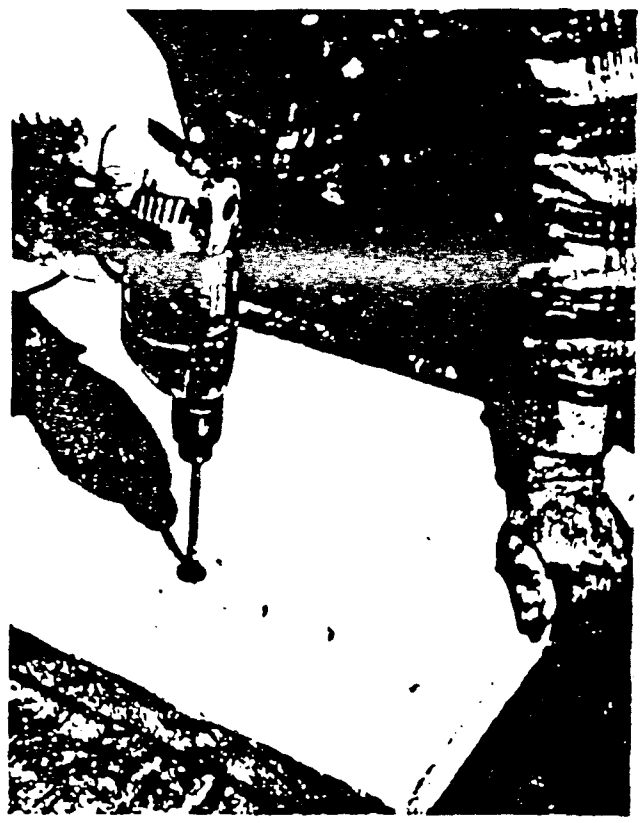
Cutting characteristics are similar to those of wood.



Cut-outs can be made with a sabre saw.



Cement-coated nails resist withdrawal best.



Drills easily with standard portable drill.

Fabrication

Lamination over Kaylo Core — Almost any facing material may be bonded to Kaylo Core. Bonding agents can be selected to meet the requirements of the particular facing — also to satisfy the service requirements of the finished product — and still offer some choice in curing procedure.

All core pieces must be brought to close tolerance in thickness. If a bonded core unit is to be produced, the entire unit may be sanded mechanically on both sides to bring all of the laminating surface to a plane. With individual pieces of core, they must be made plane to tolerances consistent with the type of face materials used and the specifications for planeness of the finished sandwich.

In laminates for which requirements for fire resistance are to be met, it is generally necessary to use tongue-and-groove construction for combustible or low-melting point faces. The depth need not exceed ¼ inch, but the width of the tongue should be relatively great, ⅜ inch or more. Such construction is intended to minimize transfer of heat through joints by radiation. Where it is important to minimize warping of the panel due to fire, the tongue-and-groove joints mentioned above provide a joining action between core pieces without disrupting the unity of the panel.

Treatment prior to Lamination — Kaylo Core Material is porous and slightly dusty. To obtain better adhesion, a primer is recommended. Several kinds of primer may be used, but they must be compatible with the slight alkalinity of Kaylo Core, and the molecular size of the primer must permit penetration of the solid phase into the pores of the core. Frequently, when solutions of large molecule materials are used as primers, the solvent penetrates the core, leaving the solid phase on the surface with little bond strength. One of the easiest primers to apply is a mixture of phenolic resin diluted with alcohol and water which may be sprayed or applied with a conventional glue spreader.

The face materials applied to the core usually require preparation to provide good bond in the laminate. Metals must be degreased and be clean at the time of laminating; wood must be smooth and not contain excess moisture. Plastic and cement products must be smooth and plane when pressed.

Adhesives — Kaylo Core may be bonded using most available adhesives, but like all laminates, it is advisable to choose an adhesive which will take advantage of the strengths of the components. The tensile strength of Kaylo Core Material is well in excess of 100 psi. Users of Kaylo Core will find it advantageous to work with their suppliers of adhesives and to specify the properties required.

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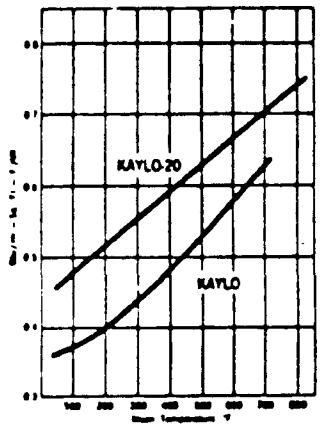
OWENS-CORNING FIBERGLAS CORPORATION
Industrial and Commercial Construction Materials Division
Fiberglas Tower, Toledo, Ohio 43601

performance characteristics

	KAYLO	KAYLO 20
density:	11 pcf approx.	12 pcf. approx.
flexural strength: (ASTM C-203)	over 50 lb/sq. in.	90 lb/sq. in.
compressive strength: (ASTM C-165) at 5% deformation	125 psi	130 psi
resistance to abrasion: (conventional temperature test — loss in weight before heating)	after 10 minutes 10% after 20 minutes 20%	
dimensional stability:	linear shrinkage after heating for 24 hours in muffle at 1200 F.—1.4%	
alkalinity:	ph 10	

thermal conductivity



economic thickness*

Selection of insulation thicknesses for any specific application should take into consideration the following important criteria. 1. Cost of insulation applied. 2. Cost of heat energy. 3. Cost of capital. 4. Cost of depreciation—plant and insulation. 5. Capital investment in heat production equipment. 6. Temperature differential. 7. Size of the pipe or surface. 8. Conductivity of insulation.

for hot piping, the tabulated thicknesses are optimum thicknesses calculated on an "Economic"* basis for heat conservation under average operating conditions and assure adequate temperature control. Other conditions may warrant the use of other thicknesses.

**From "How to Determine Economic Thickness of Insulation"—National Insulation Manufacturers Association.*

economic thickness — Kaylo block to 1200 F — ambient still air 80 F

ET—economic thickness HL—heat loss
ST—surface temperature Btu/hr/lin/foot

THICK	200 F		300 F		400 F		500 F		600 F		700 F		800 F		900 F		1000 F		1100 F		1200 F	
	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.
1.000	38	103	72	124	109	147																
1.500	27	96	51	111	78	127	107	145														
2.000	21	93	40	104	60	117	83	130	107	145												
2.500	17	90	33	100	49	110	68	121	87	133	109	146										
3.000	14	89	28	97	42	105	57	115	74	125	92	136	112	148								
3.500	13	88	24	95	36	102	49	110	64	119	80	129	97	139	116	150						
4.000	11	87	21	93	32	99	44	107	56	114	70	123	85	132	102	142	120	153				
4.500	10	86	19	91	28	97	39	104	50	111	63	118	76	127	91	136	107	145	125	156		
5.000	9	85	17	90	26	96	35	101	46	108	57	115	69	122	82	130	97	139	113	149	130	159
5.500	8	85	16	89	23	94	32	100	42	105	52	112	63	118	75	126	88	134	103	143	118	152
6.000	7	85	14	89	22	93	30	98	38	103	48	109	58	115	69	122	81	130	94	138	109	146

*calculated

Kaylo 20 Block to 1800 F — ambient still air 80 F

Operating Temp. F	Power ET	Power HL	Power ST	Process ET	Process HL	Process ST
1300	7½	111	136	6	135	148
1400	8	117	139	6½	143	152
1500	8	123	142	7	151	155
1600	8½	129	145	7	158	159
1700	9	135	148	7½	165	163
1800	9½	141	151	7½	172	166

specification compliance

HH-I-523c Insulation Block, Pipe Covering, Thermal, (Calcium Silicate for temperatures up to 1200°F). Type 1.

MIL-I-2819E Insulation Block, Thermal. Class 1, 2, and 3. ASTM C533-67.

MIL-I-24244 (ships) Insulating Materials, Thermal, with Special Corros on and Chloride Requirements (Kaylo only), Type 3A, 3B.

sizes

thickness—1", 1½", 2", 2½", 3", 3½" and 4"
width—3", 6", 12" and 18"
length—18" to 36"
form—Block

beveled lags

For pipe sizes greater than those for which Kaylo and Kaylo 20 Insulation sizes are available, Kaylo and Kaylo 20 beveled lags may be used to insulate piping. Lags beveled to fit pipes from 18" to 36" in diameter are available in thickness of 1½", 2", 2½", 3". Lags are 36" long and 3" wide.

application recommendations

Kaylo and Kaylo 20 Block Insulations are held in place by mechanically fastening with bands, welded rods or studs. The insulation may be finished with a trowel coat of insulating cement, canvassed and painted. Outdoor installations require weatherproofing with mastics or metal jacketing.

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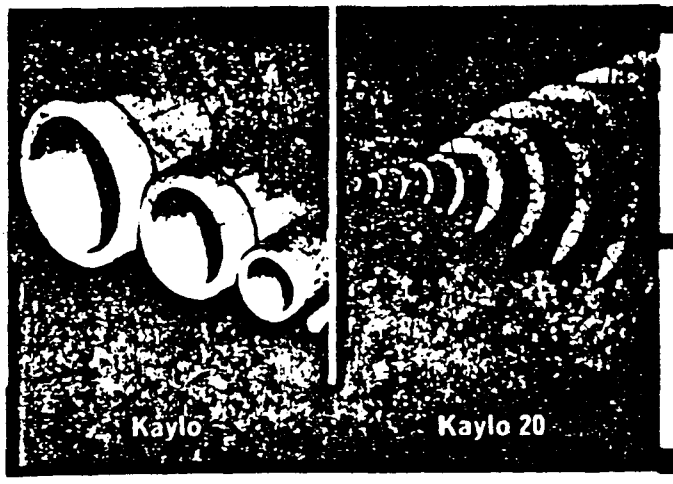
Pipe Insulation



Kaylo & Kaylo 20 Pipe Insulations

rigid hydrous calcium silicate pipe insulations for heated piping up to 1800F.

uses

Standard Kaylo is recommended for use on heated piping operating up to *1200F* and *Kaylo 20 extends the temperature* range to 1800F. These thoroughly field-tested insulations have the physical properties most desirable for efficient, durable work for indoor and outdoor, power and process piping. A variety of jackets are available for surface finish and weatherproofing.

description

Kaylo® & Kaylo 20® pipe insulations are rigid hydrous calcium silicate heat insulations for [illegible] all heated piping up to 1800F — indoors and outdoors. The products are precision molded in sections or segments from a chemically reacted material. A small amount of asbestos fiber is added to improve mechanical strength. Kaylo is gray. Kaylo 20 has a slight pinkish color to distinguish it from Kaylo.

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benefits

lower operating costs — Kaylo insulations have exceptional thermal efficiency. The low k factor of .40 at 200 mean temperature means lower operating cost, better temperature control for process operations.

rugged — Kaylo Pipe Insulations are strong and rigid to resist mechanical abuse in shipping, handling and in service.

versatile — Kaylo's extended temperature range covers a broad number of uses with one material. All heated piping requirements to 1800F and in sizes from ½" to 30" IPS can be met with Kaylo and Kaylo 20.

will not cause stress corrosion cracking — Kaylo will not cause stress corrosion cracking of stainless steel because Kaylo contains an inhibitor, and has less than 200 ppm soluble chlorides.

unaffected by moisture — Kaylo can be completely saturated in water without appreciable loss of strength and regains its strength and thermal value after drying out.

clean, neat installation — Kaylo cuts cleanly leaving a sharp square edge for neater appearance on fittings. Rigid manufacturing tolerances assure uniform, smooth, unbroken joints.

variety of jackets — A variety of factory-applied jackets allows a selection of product for indoor finished appearance or for weatherproofing insulation on outdoor lines.

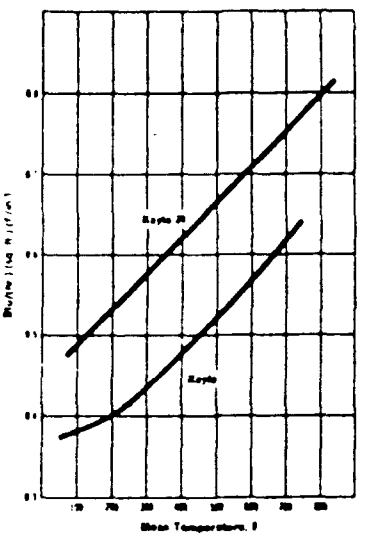
nesting sizes — Kaylo and Kaylo 20 Pipe Insulations are manufactured to Simplified Dimensional Standards to permit nesting sizes for double layer applications.

†Kaylo is a registered trademark (Reg. U.S. Pat. Off.) of Owens-Corning Fiberglas Corp.

performance characteristics

	Kaylo	Kaylo 20
density (approx.)	11 lb. pcf.	12 lb. pcf.
flexural strength (ASTM C-446)	75 lbs./sq. in.	90 lbs./sq. in.
compressive strength (ASTM C-165) at 5% deformation	125 psi	130 psi
resistance to abrasion (Conventional tumbling test-loss in weight before heating)	after 10 minutes, 20% after 20 minutes, 40%	
alkalinity	ph 10	ph 10
corrosion resistance	does not cause or accelerate corrosion of steel, aluminum, or stainless steel	
Specific heat	0.22 btu/lb. F	
dimensional stability linear shrinkage after heating for 24 hours in a muffle		
% length loss	1.6 (at 1200°F)	2.5 (at 1800°F)

thermal conductivity



sizes

thickness — Kaylo Pipe Insulation is available in single or double layer thicknesses from 1" to 3" depending upon pipe size. Kaylo Tube Insulation is available in single layer thicknesses of 1" and 1½".

pipe sizes — Kaylo Pipe Insulation is available to fit nominal pipe sizes from ½" to 39" in diameter. Kaylo Tube Insulation will fit nominal copper tubing sizes from ⅜" to 3" in diameter.

forms — Kaylo Pipe Insulation is available in sectional or multisegmental form depending upon pipe size. All insulation is furnished in 3 ft. sections.

jackets

canvas — Standard canvas & 8 oz. canvas jacket are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms, they are furnished but not adhered. Bands are available for use with this product at slight additional charge and will be furnished on request.

Kaylo Klad — Kaylo is also available with an embossed aluminum jacket .016" thick or .010" thick stainless steel jacket. These jackets provide greater resistance to mechanical damage and present a neat finished appearance to pipe lines. The longitudinal seam has a self-locking joint. Butt sealing strips with integral mastic and protective asbestos cover are furnished for sealing end joints.

specification compliance

HH-I-523c — Insulation Block and Pipe Covering Thermal (Calcium Silicate for Temperatures up to 1200F). Type II, Class A through F.

MIL-I-2781D (Int. Amend. 1) — Insulation Pipe Covering, Thermal: Grade I, Class b; Grade II, Class d; Grade III, Class e, Type I and II.

MIL-I-24244 (Ships) — Insulation Materials, Thermal, with Special Corrosion and Chloride Requirements, Type 1A, 1C, 1D, 1E.

ASTM C533-67.

application recommendations

outdoor lines — Kaylo Pipe Insulations are mechanically fastened by wiring in place using 16 gauge wire on 9" centers and subsequently covered with a weatherproof jacket of metal or 45 lb. roofing felt. See Application Specifications for complete details.

indoor lines — Kaylo for indoor piping work is furnished with a factory-applied canvas jacket and held in place with bands or wire. The jacket has overlapping joint flaps that are smoothly pasted in place. Canvas should be sized to provide a base for painting.

fittings — Fitting are insulated with mitered segments of Kaylo wired in place and finished with a ¼" layer of insulating cement. Flanges and valves are insulated with oversized pipe insulation. They are finished off with canvas pasted in place for indoor lines or reinforced waterproof mastic for outdoor lines.



economic thickness

Selection of insulation thicknesses for any specific application should take into consideration the following important criteria. 1. Cost of insulation applied. 2. Cost of heat energy. 3. Cost of capital. 4. Cost of depreciation—plant and insulation. 5. Capital investment in heat production equipment. 6. Temperature differential. 7. Size of the pipe or surface. 8. Conductivity of insulation.

for hot piping, the tabulated thicknesses are optimum thicknesses calculated on an "Economic"* basis for heat conservation under average operating conditions and assures adequate temperature control. Special conditions may warrant the use of other thicknesses.

**From "How to Determine Economic Thickness of Insulation"—National Insulation Manufacturers Association.*

economic thickness*—kaylo pipe insulation—process piping (80F ambient still air)

PIPE TEMP.	200			400			600			800			1000			1200		
TEMP. DIFF.	120			320			520			720			920			1120		
IPS	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST
½	1	18	95	1	51	122	1	89	152	1	132	187	1	182	228	1½	202	198
¾	1	22	98	1	61	129	1	106	166	1	157	207	1	215	254	1½	232	215
1	1	23	95	1	64	123	1	111	154	1	165	190	1½	191	179	1½	252	211
1¼	1	29	99	1	81	143	1	140	173	1	207	218	1½	213	179	1½	281	211
1½	1	29	97	1	82	128	1	143	163	1½	173	161	1½	239	192	1½	315	227
2	1	34	98	1	96	130	1	167	166	1½	198	163	1½	273	194	2	308	188
2½	1	39	98	1	110	131	1½	136	128	1½	203	151	2	247	155	2	326	179
3	1	47	100	1	131	135	1½	174	141	1½	260	171	2	304	173	2½	355	176
3½	1	44	95	1	123	123	1½	175	133	1½	261	159	2	311	164	2½	366	168
4	1	55	99	1	155	134	1½	209	144	2	262	150	2	361	177	2½	418	181
4½	1	52	96	1	147	125	1½	206	135	2	262	143	2	363	168	2½	419	171
5	1	67	100	1	188	137	1½	250	147	2	308	154	2	426	183	2½	481	184
6	1	81	102	1½	171	121	1½	298	152	2	355	157	2	489	186	2½	558	190
7	1½	66	94	1½	187	120	1½	324	150	2	395	158	2½	467	165	2½	617	192
8	1½	73	95	1½	207	121	1½	359	151	2	434	159	2½	497	162	3	583	170
9	1½	80	95	1½	225	121	1½	391	151	2	454	155	2½	541	164	3	631	171
10	1½	85	94	1½	240	120	2	341	133	2½	433	143	2½	598	167	3½	633	162
11	1½	93	94	1½	262	121	2	368	133	2½	474	145	2½	656	170	3½	682	164
12	1½	99	94	1½	279	120	2	401	135	2½	507	146	2½	701	171	3½	727	165
14	1½	117	96	1½	331	125	2	456	139	2½	570	150	2½	787	177	3½	804	169
16	1½	134	96	1½	377	126	2	517	140	2½	643	151	2½	888	179	3½	901	171
18	1½	149	97	1½	419	126	2	574	141	2½	712	152	3	849	162	3½	993	173
20	1½	164	97	1½	462	127	2	630	141	2½	781	153	3	930	163	3½	1085	174
24	1½	194*	97	1½	546	127	2	744	142	2½	919	154	3	1091	165	3½	1270	175

economic thickness—kaylo pipe insulation—power & utility piping (80F ambient still air)

PIPE TEMP.	200			400			600			800			1000			1200		
TEMP. DIFF.	120			320			520			720			920			1120		
IPS	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST
½	1	18	95	1	51	122	1½	74	123	1½	111	145	2	138	144	2½	161	136
¾	1	22	98	1	61	129	1½	85	130	2	112	132	2	156	153	2½	179	143
1	1	23	95	1	64	123	1½	93	128	2	122	131	2½	152	133	3	188	137
1¼	1	29	99	1	81	134	1½	103	128	2	143	140	2½	176	142	3	215	145
1½	1	29	97	1	82	128	1½	116	134	2½	128	119	2½	177	134	3	217	139
2	1	34	98	1½	76	112	1½	133	136	2½	151	126	2½	209	144	3	254	148
2½	1	39	98	1½	78	107	2	119	116	2½	161	123	3	205	129	3½	251	134
3	1	47	100	1½	100	115	2	147	125	2½	194	132	3	243	139	3½	293	143
3½	1	44	95	1½	101	111	2	151	121	3	180	119	3½	231	126	4	286	132
4	1	55	99	1½	121	117	2½	153	117	3	203	124	3½	257	131	4	316	137
4½	1	52	96	1½	118	112	2½	153	113	3	207	121	3½	264	128	4	321	133
5	1	67	100	1½	144	119	2½	176	118	3	235	126	3½	296	134	4	356	139
6	1	81	102	2	137	110	2½	205	120	3	270	129	3½	331	135	4½	356	129
7	1½	66	94	2	152	110	2½	226	121	3	291	128	3½	367	137	4½	416	137
8	1½	73	95	2	167	110	2½	241	120	3½	290	122	4	368	130	4½	452	139
9	1½	80	95	2	175	109	2½	262	121	3½	314	123	4	398	132	5	456	133
10	1½	85	94	2	196	110	3	258	115	3½	346	125	4	437	134	5	497	135
11	1½	93	94	2	212	111	3	278	116	3½	372	126	4	469	135	5	532	136
12	1½	99	94	2	231	112	3	297	116	4	360	120	4½	459	129	5	565	137
14	1½	117	96	2½	219	107	3	331	119	4	397	122	4½	503	131	5½	579	134
16	1½	134	96	2½	248	107	3	372	119	4	443	123	4½	561	132	5½	641	135
18	1½	149	97	2½	274	108	3	411	120	4	488	124	4½	617	133	5½	703	137
20	1½	164	97	2½	301	108	3	450	120	4	533	124	4½	672	134	5½	764	137
24	1½	194	97	2½	354	108	3½	464	115	4½	565	120	5	719	129	6	824	133

table key (ambient still air at 80F) ET—economic thickness HL—heat loss...Btu/hr/lineal foot

economic thickness – kaylo 20 pipe insulation – power & utility piping

(80F ambient still air)

Temp.	1300			1400			1500			1600			1700			1800		
Pipe Size	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST
½	2½	221	152	2½	245	160	3	254	150	3	278	157	3	304	164	3½	313	156
¾	2½	243	156	3	252	148	3	278	155	3	305	162	3½	314	154	3½	342	161
1	2½	269	161	3	277	152	3	306	160	3½	316	152	3½	345	159	3½	375	166
1¼	3	279	149	3	310	157	3	342	165	3½	351	157	3½	384	164	3½	417	172
1½	3	284	153	3½	309	146	3½	362	160	3½	368	160	4	397	160	4	434	168
2	3	337	156	3½	347	150	3½	383	158	3½	421	165	4	432	159	4	469	166
2½	3	374	160	3½	385	154	3½	425	162	3½	466	170	4	476	163	4	518	171
3	3½	388	150	4	402	146	4	444	153	4½	458	150	4½	500	156	4½	545	163
3½	4	390	142	4	434	149	4	479	156	4½	494	152	4½	539	159	5	555	155
4	4	419	144	4	465	151	4½	481	148	4½	528	154	5	545	151	5	593	158
4½	4	446	145	4½	464	143	4½	512	150	5	530	147	5	579	153	5½	598	151
5	4½	445	138	4½	495	145	5	515	143	5	565	149	5½	585	147	5½	637	153
6	4½	502	141	5	523	140	5	578	146	5½	560	144	5½	655	150	6	678	149
7	4½	550	143	5	572	142	5	632	148	5½	655	147	6	679	146	6	738	151
8	5	560	137	5	622	143	5½	647	142	5½	710	149	6	735	148	6½	761	147
9	5	603	138	5½	630	138	5½	696	144	6	722	143	6	789	149	6½	817	149
10	5	653	140	5½	681	139	5½	752	146	6	779	145	6½	809	145	6½	880	150
11	5½	652	134	5½	724	140	6	754	140	6	829	146	6½	859	146	7	890	146
12	5½	693	135	5½	770	141	6	801	141	6½	834	141	6½	911	147	7	943	147
14	5½	742	136	6	776	137	6	857	143	6½	891	143	7	926	143	7	1007	148
16	6	772	132	6	858	138	6½	896	139	7	934	139	7	1020	144	7½	1058	145
18	6	844	133	6½	886	134	6½	978	140	7	1018	140	7½	1059	141	7½	1153	146
20	6	917	134	6½	960	135	6½	1060	141	7	1102	142	7½	1146	142	7½	1247	148
24	6	1060	136	6½	1108	137	7	1157	138	7½	1206	139	7½	1318	144	8	1366	145
30	6½	1195	133	7	1253	134	7½	1312	135	7½	1440	141	8	1497	142	8½	1555	143
36	6½	1620	142	7	1690	144	7½	1790	147	7½	1950	153	8	2050	155	8½	2150	158

ET—economic thickness **HL**—heat loss . . . Btu/hr/lineal foot **ST**—surface temperature

OWENS CORNING FIBERGLAS

OWENS-CORNING FIBERGLAS CORPORATION

Industrial and Commercial Construction Materials Division, 717 Fifth Avenue, New York, New York 10022
General Offices, Toledo, Ohio 43601

PUB NO 1-FN-4350

July 1968 – Litho in USA

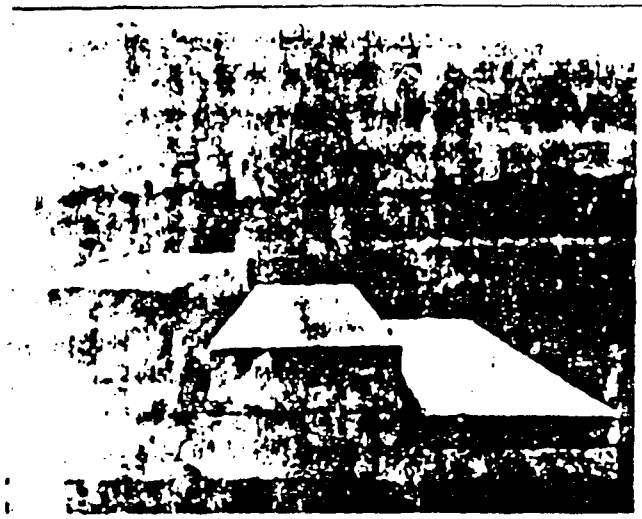
OWENS/CORNING FIBERGLAS

USN USCG

MIL-I-24244 (Ships) Int. Amend. 2, Type 3A & 3B
Mil-I-2819E Classes 1 & 2 Kaylo
20 MIL-I-2819E Class 3 Kaylo
164 009/64/1 Kaylo 10; 164.009/65/1 Kaylo 20
Marine D.12

Kaylo 10 & Kaylo 20 Block Insulation

rigid calcium silicate insulations for all types of heated equipment operating at temperatures up to 1800F.



uses

Kaylo 10® Block is for use on indoor or outdoor equipment operating at temperatures up to 1200F. Kaylo block is ideally suited for use on stainless steel vessels and equipment as it helps inhibit stress corrosion cracking. Typical applications are for boilers, breeching, tanks, vessels. Kaylo 10 Block is white in color.

Kaylo 20® with its high temperature limit of 1800F extends its use to include refractory wall backing for furnaces and boilers and fireproofing of equipment and vessel skirts.

description

Kaylo 10 and Kaylo 20 Block Insulations are rigid hydrous calcium silicate heat insulations reinforced with asbestos fibers. They are strong, efficient and are highly resistant to abrasion and moisture damage. Kaylo 20 has a slightly pink color to distinguish it from Kaylo 10.

benefits

high thermal efficiency—both Kaylo 10 and Kaylo 20 offer excelent thermal efficiency coupled with high strength. A low k of .40 for Kaylo 10 and .52 for Kaylo 20 at 200F mean temperature proves that Kaylo will provide significant savings in operating costs over [illegible] of the equipment.

resistant to abuse—[illegible] mechanical damage from use of hard, tough, reinforced structure.

strong—less breakage in shipment and handling. High temperatures have little effect on strength characteristics.

will not cause stress corrosion cracking—Kaylo 10 will not cause stress corrosion cracking of stainless steel because Kaylo 10 contains less than 75 ppm soluble chlorides as well as an inhibitor which prevents trace quantities of chlorides from the atmosphere or other sources from causing cracking and possible failure of piping and equipment.

resistant to moisture damage—unlike many other insulations, Kaylo is not affected appreciably from moisture damage. It regains thermal efficiency and strength after drying out. Outdoor installations must be weatherproofed, however, for long continuous service.

dimensionally stable—Kaylo does not shrink appreciably in service, even at elevated temperatures. This means less heat leakage at the joints. And Kaylo will not warp or crack in service.

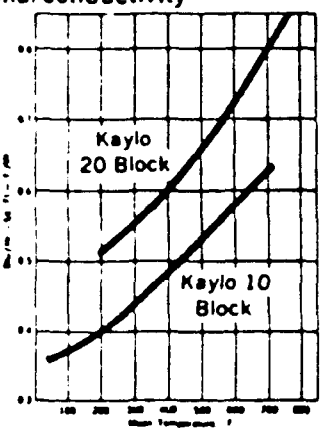
fabricates easily—ordinary insulators tools are all that is required to fabricate Kaylo. It cuts with a clean true edge for tighter fit at the joints. Fittings are neater, faster.

*Trademark Registered Owens-Corning Fiberglas Corporation

Performance characteristics

	KAYLO 10	KAYLO 20
density:	11 pcf approx	12 pcf approx
flexural strength: (ASTM C 203)	60 psi average	65 lb./sq. in.
compressive strength: (ASTM C 165) at 5% deformation	115 psi	110 psi
resistance to abrasion: (ASTM C 421)	after 10 minutes, 20% max after 20 minutes, 45% max	
dimensional stability: (ASTM C 356)	linear shrinkage after heating for 24 hours in muffle at 1200F.—1.4% (Kaylo 10) for 24 hours in muffle at 1800F.—2.0% (Kaylo 20)	
hardness: (ASTM C-569	.60	.70

thermal conductivity



economic thickness*

Selection of insulation thicknesses for any specific application should take into consideration the following important criteria. 1. Cost of insulation applied. 2. Cost of heat energy. 3. Cost of capital. 4. Cost of depreciation—plant and insulation. 5. Capital investment in heat production equipment. 6. Temperature differential. 7. Size of the pipe or surface. 8. Conductivity of insulation.

**From "How to Determine Economic Thickness of Insulation"— National Insulation Manufacturers Association.*

economic thickness— Kaylo 10 block to 1200 F—ambient still air 80 F

ET—economic thickness HL—heat loss
ST—surface temperature Btu/hr/lin/foot

THICK	200 F		300 F		400 F		500 F		600 F		700 F		800 F		900 F		1000 F		1100 F		1200 F	
	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.	HEAT LOSS	SURF. TEMP.
1 000	38	103	72	124	109	147																
1 500	27	96	51	111	78	127	107	145														
2 000	21	93	40	104	60	117	83	130	107	145												
2 500	17	90	33	100	49	110	68	121	87	133	109	146										
3 000	14	89	28	97	42	105	57	115	74	125	92	136	112	148								
3 500	13	88	24	95	36	102	49	110	64	119	80	129	97	139	116	150						
4 000	11	87	21	93	32	99	44	107	56	114	70	123	85	132	102	142	120	153				
4 500	10	86	19	91	28	97	39	104	50	111	63	118	76	127	91	136	107	145	125	156		
5 000	9	85	17	90	26	96	35	101	46	108	57	115	69	122	82	130	97	139	113	149	130	159
5 500	8	85	16	89	23	94	32	100	42	105	52	112	63	118	75	126	88	134	103	143	118	152
6 000	7	85	14	89	22	93	30	98	38	103	48	109	58	115	69	122	81	130	94	138	109	146

*calculated

Kaylo 20 Block to 1800 F—ambient still air 80 F

Operating Temp. F	Power ET	Power HL	Power ST	Process ET	Process HL	Process ST
1300	7½	111	136	6	135	148
1400	8	117	139	6½	143	152
1500	8	123	142	7	151	155
1600	8½	129	145	7	158	159
1700	9	135	148	7½	165	163
1800	9½	141	151	7½	172	166

sizes

thickness—1", 1½", 2", 2½", 3", 3½" and 4"
width—3", 6", 12" and 18"
length—18" to 36"
form—Block

beveled lags

For pipe sizes greater than those for which Kaylo 10 and Kaylo 20 Pipe Insulation sizes are available, Kaylo 10 and Kaylo 20 beveled lags may be used to insulate piping. Lags beveled to fit pipes from 18" to 72" in diameter are available in thickness of 1½," 2", 2½", 3". Lags are 36" long and 3" wide.

application recommendations

Kaylo 10 & 20 Block Insulations are held in place by mechanically fastening with bands, welded rods or studs. The insulation may be finished with a trowel coat of insulating cement, canvassed and painted. Outdoor installations require weatherproofing with mastic or metal jacketing.

OWENS/CORNING FIBERGLAS

OWENS-CORNING FIBERGLAS CORPORATION
Industrial and Commercial Construction Materials Division
Fiberglas Tower, Toledo, Ohio 43601

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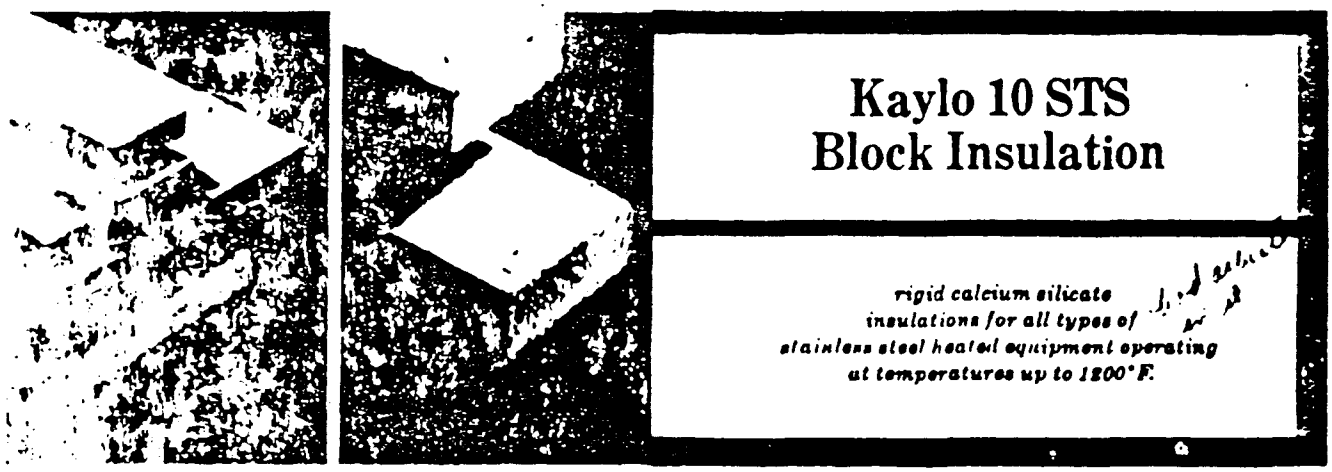
power & process equipment 6.7
vessels & tanks 7.8
July, 1968

Equipment Insulation



Kaylo 10 STS Block Insulation

rigid calcium silicate insulations for all types of stainless steel heated equipment operating at temperatures up to 1200°F.

The problem of stress corrosion cracking of stainless steel and subsequent equipment failure has been attributed to a combination of fabrication or pressure stresses, coupled with, or accelerated by, chlorides carried to the vessel surface by water leaking through the weather proof finishes. Papers written on this subject also indicated that the problem occurs in a certain temperature range.*

There is no proof that these soluble chlorides are the only cause of this phenomenon, but laboratory tests over extended periods of time indicate that cracking occurs much more readily when soluble chlorides are present. This is why Owens-Corning Fiberglas has developed Kaylo 10 STS Block Insulation using special inhibitors which will help slow down the reaction of the chlorides on stainless steel, reducing the hazard of stress corrosion cracking until the source of the leak or chlorides can be repaired. Please note that Kaylo 10 STS Block Insulation should not be used as a means of preventing stress corrosion cracking. *It will not serve as a substitute for proper initial system design and proper maintenance.*

*"Another Look At The Stress Corrosion Cracking Of Stainless Steel Under Thermal Insulation." W. G. Ashbaugh. Paper presented at 20th Anniversary Conference, National Association of Corrosion Engineers, March, 1964, Chicago.

uses

Kaylo 10 STS Block Insulation is for use on hot Type 304 austenitic stainless steel indoor or outdoor equipment operating at temperatures up to 1200°F. Kaylo 10 STS Block Insulation is ideally suited for use on stainless steel vessels and equipment as it helps inhibit stress corrosion cracking.

description

Kaylo 10 STS Block Insulation is a gray rigid hydrous calcium silicate high temperature equipment insulation. It contains special inhibitors which help retard the stress corrosion cracking of stainless steel resulting from chloride contamination. The insulation blocks are marked with a 1" wide black stripe across the 18" width in the center of the block.

benefits

lower operating costs—Kaylo 10 STS Block Insulation has good thermal efficiency. The low k factor of .40, (at 200°F. mean temperature,) means lower operating cost, better temperature control for process operations.

rugged—Kaylo 10 STS Block Insulation is tough and rigid and will resist most mechanical abuse in shipping, handling and in service.

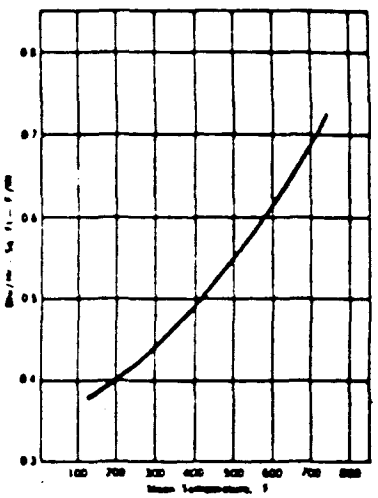
does not contribute to stress corrosion cracking—Kaylo 10 STS material itself will not contribute to stress corrosion cracking of stainless steel because it contains an inhibitor, and has less than 200 ppm residual soluble chlorides. It will not crack when subjected to the 6 day Dana Stress Corrosion Cracking Test.

unaffected by moisture—Kaylo can be completely saturated in water without appreciable loss of strength and regains its strength and thermal value after drying out. However, long periods of exposure to moisture may reduce the effectiveness of the inhibitors.

clean, neat installation—Kaylo cuts cleanly leaving a sharp square edge for a neat appearance.

performance characteristics

density: approximately	11 pcf.
flexural strength: (ASTM C-203)	50 psi.
compressive strength: (ASTM C-165) at 5% deformation	80 psi.
thermal conductivity: 0.40 at 200 F mean temp.	
alkalinity:	ph 10
shrinkage (24 hrs. at 1200 F)	
% Loss in weight	10
% Linear shrinkage (max.)	1.6
weight loss by tumbling	
% Loss in weight after 10 min. (max.)	20
% Loss in weight after 20 min. (max.)	45
specific heat	0.22 btu/lb. F.
stress corrosion: (1500 ppm chloride method)	stainless steel will not crack when subjected to 6 day Dana Stress Corrosion Cracking Test



heat transfer data* — Kaylo 10 STS to 1200° F — ambient still temperature 80° F.

Operating Temp.	500°F.		600°F.		700°F.		800°F.		900°F.		1000°F.		1100°F.		1200°F.	
Thickness Chemical Process	1½		1½		2		2½		3		3½		4		4½	
	HEAT LOSS	SURF TEMP	HEAT LOSS	SURF TEMP	HEAT LOSS	SURF TEMP	HEAT LOSS	SURF TEMP	HEAT LOSS	SURF TEMP	HEAT LOSS	SURF TEMP	HEAT LOSS	SURF TEMP	HEAT LOSS	SURF TEMP
2	83	131	108	146												
2½	68	121	88	134	111	148										
3	57	115	75	125	94	137	115	150								
3½	49	110	65	119	81	130	100	141	120	153						
4	44	107	57	115	72	124	88	134	106	145	126	157				
4½	39	104	51	111	64	119	78	128	95	138	113	149				
5	35	102	46	108	58	115	71	123	86	132	102	142	120	153		
5½	32	100	42	106	53	112	65	119	78	128	93	137	109	147	127	158
6	30	98	39	104	48	110	59	116	72	124	85	132	100	141	117	151

*calculated

sizes

thickness—1", 1½", 2", 2½", 3", 3½" and 4"
width—3", 6", 12" and 18"
length—18" to 36"
form—block

specification compliance

Fed. Spec. HH-I-523c Insulation Block and Pipe Covering, Thermal, (Calcium Silicate for temperatures up to 1200°F). Type 1.

Mil. Spec. MIL-I-2817E Insulation Block, Thermal. Class 1 & 2.

Navy Spec. 24244 (ships) Insulating Materials, Thermal, with Special Corrosion and Chloride Requirements, Type 3A, 3B.

ASTM C533-67.

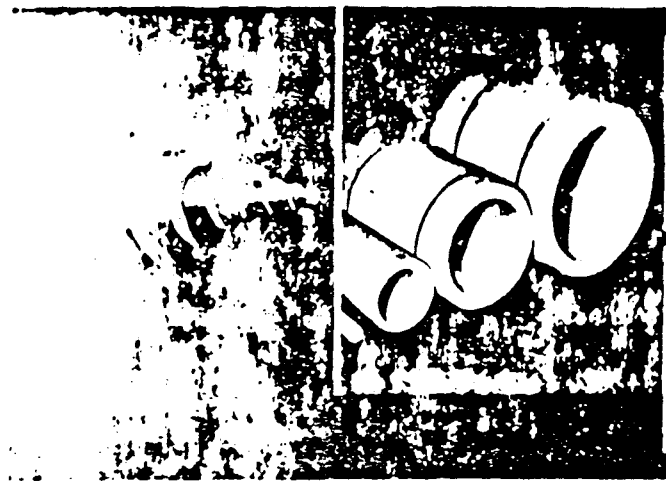
application recommendations

Kaylo 10 STS Block Insulations are held in place by mechanically fastening with bands, welded rods or studs. The insulation may be finished with a trowel coat of insulating cement, canvassed and painted. Outdoor installations require weatherproofing with mastics or metal jacketing. Proper attention should be paid to the selection of accessory materials such as cements, adhesives, etc, to avoid chloride contamination from these sources.

OWENS-CORNING FIBERGLAS CORPORATION
Industrial and Commercial Construction Materials Division
717 Fifth Avenue, New York, New York 10022 • General Offices, Toledo, Ohio 43601

power & process piping systems
July, 1968

Pipe Insulation



Kaylo 10 STS Pipe Insulation

for hot stainless steel piping up to 1200 degree F.

The problem of stress corrosion cracking of stainless steel and subsequent pipe failure has been attributed to a combination of fabrication on pressure stresses, coupled with, or accelerated by, chlorides deposited on the pipe surface by water leaking through the weather proof finishes. Papers* written on this subject also indicate that the problem occurs in certain temperature range.

There is no proof that these soluble chlorides are the only cause of this phenomenon, but laboratory tests over extended periods of time indicate that cracking occurs much more readily when soluble chlorides are present. This is why Owens-Corning Fiberglas has developed Kaylo 10 STS Pipe Insulation using special inhibitors which will help slow down the reaction of the chlorides on stainless steel, reducing the hazard of stress corrosion cracking until the source of the leak or chlorides can be repaired. Please note that Kaylo 10 STS should not be used as a means of preventing stress corrosion cracking. It will not serve as a substitute for proper initial system design and proper maintenance.

*"Another Look At The Stress Corrosion Cracking Of Stainless Steel Under Thermal Insulation" W. G. Ashbaugh. Paper presented at 20th Anniversary Conference, National Association Of Corrosion Engineers, March, 1964, Chicago.

uses

Designed for use on hot Type 304 austenitic stainless steel process piping operating at temperatures up to 1200° F., indoors or out, when protected with a weather proof jacket.

description

Kaylo 10 STS Pipe Insulation is a rigid hydrous calcium silicate high temperature insulation. It contains special inhibitors which help retard the stress corrosion cracking of stainless steel resulting from chloride contamination. The insulation sections are gray in color with a 1" wide black longitudinal stripe on the outer surface.

benefits

lower operating costs—Kaylo 10 STS Pipe Insulation has good thermal efficiency. The low k factor of .40 at 200° F. mean temperature means lower operating cost, better temperature control for process operations.

rugged—Kaylo 10 STS Pipe Insulation is tough and rigid and will resist most mechanical abuse in shipping, handling and in service.

does not contribute to stress corrosion cracking—the Kaylo 10 STS material itself will not contribute to stress corrosion cracking of stainless steel because it contains an inhibitor, and has less than 200 ppm residual soluble chlorides. It will not crack when subjected to the 6 day Dana Stress Corrosion Cracking Test.

unaffected by moisture—Kaylo can be completely and regains its strength and thermal value after drying out. However, long periods of exposure to moisture may reduce the effectiveness of the inhibitors.

clean, neat installation—Kaylo cuts cleanly leaving a sharp square edge for neater appearance on fittings.

variety of jackets—a variety of factory-applied jackets allows a selection of product for indoor finished appearance or for weatherproofing insulation on outdoor lines. Proper attention should be paid to the selection of accessory materials such as cements, adhesives, etc., to avoid chloride contamination from these sources.

nesting sizes—Kaylo 10 STS Pipe Insulations are manufactured to Simplified Dimensional Standards to permit nesting sizes for double layer applications. Material for double layer application is nested and

economic thickness* — KAYLO 10 STS pipe insulation

Selection of insulation thicknesses for any specific application should take into consideration the following important criteria: 1. Cost of insulation applied. 2. Cost of heat energy. 3. Cost of capital. 4. Cost of depreciation — plant and insulation. 5. Capital investment in heat production equipment. 6. Temperature differential. 7. Size of the pipe or surface. 8. Conductivity of insulation.

for hot piping, the tabulated thicknesses are optimum thicknesses calculated on an "Economic"* basis for heat conservation under average operating conditions and assures adequate temperature control. Special conditions may warrant the use of other thicknesses.

*From "How to Determine Economic Thickness of Insulation" — National Insulation Manufacturers Association.

table key

ET — economic thickness
ST — surface temperature
HL — heat loss...Btu/hr/lineal foot

power & utility piping to 1200F — (80F ambient still air)

PIPE TEMP.		200			400			600			800			1000			1200	
TEMP. DIFF.		120			320			520			720			920			1120	
IPS	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST
½	1	17	94	1	48	119	1½	71	121	1½	108	143	2	139	145	2½	168	139
¾	1	20	97	1	57	127	1½	81	127	2	109	131	2	157	153	2½	187	145
1	1	21	94	1	60	120	1½	88	126	2	118	130	2½	153	134	3	196	140
1¼	1	27	98	1	76	131	1½	98	126	2	139	138	2½	177	142	3	224	148
1½	1	28	96	1	78	125	1½	111	132	2½	124	118	2½	178	134	3	227	141
2	1	32	97	1½	72	110	1½	126	133	2½	147	125	2½	210	144	3	265	151
2½	1	37	97	1½	73	106	2	113	114	2½	156	122	3	206	130	3½	262	137
3	1	44	98	1½	94	113	2	140	123	2½	189	131	3	244	139	3½	306	146
3½	1	44	94	1½	94	109	2	143	119	3	175	118	3½	232	126	4	298	134
4	1	52	98	1½	111	114	2½	145	115	3	197	123	3½	259	131	4	330	140
4½	1	49	95	1½	111	110	2½	145	111	3	202	120	3½	265	128	4	335	135
5	1	63	99	1½	135	116	2½	167	116	3	229	125	3½	298	134	4	371	142
6	1	77	101	2	128	108	2½	194	118	3	263	128	3½	333	135	4½	396	138
7	1½	62	93	2	143	108	2½	215	119	3	283	127	3½	370	137	4½	434	139
8	1½	69	94	2	157	109	2½	228	118	3½	282	121	4	370	131	4½	472	141
9	1½	75	94	2	164	107	2½	249	118	3½	306	122	4	400	132	5	476	135
10	1½	80	93	2	184	108	3	245	114	3½	336	124	4	439	134	5	519	138
11	1½	87	94	2	198	109	3	264	114	3½	362	124	4	472	135	5	556	139
12	1½	93	93	2	216	110	3	282	115	4	351	119	4½	462	129	5	590	140
14	1½	111	95	2½	206	105	3	314	117	4	386	121	4½	506	131	5½	611	137
16	1½	126	95	2½	232	106	3	353	117	4	431	122	4½	564	133	5½	677	138
18	1½	140	96	2½	257	106	3	391	118	4	475	123	4½	620	134	5½	742	140
20	1½	154	96	2½	282	106	3	428	118	4	518	123	4½	676	134	5½	807	144
24	1½	183	96	2½	332	107	3½	441	113	4½	549	119	5	723	130	6	860	136

process piping to 1200F — (80F ambient still air)

PIPE TEMP.		200			400			600			800			1000			1200	
TEMP. DIFF.		120			320			520			720			920			1120	
IPS	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST
½	1	17	94	1	48	119	1	85	149	1	129	185	1	184	229	1½	211	203
¾	1	20	97	1	57	127	1	101	162	1	153	204	1	217	256	1½	242	221
1	1	21	94	1	60	120	1	106	150	1	161	187	1½	193	180	1½	263	216
1¼	1	27	98	1	76	131	1	133	169	1	203	215	1½	214	180	1½	293	217
1½	1	28	96	1	78	125	1	130	159	1½	169	159	1½	241	192	1½	329	233
2	1	32	97	1	91	127	1	159	162	1½	193	161	1½	275	195	2	321	193
2½	1	37	97	1	104	128	1½	130	125	1½	198	149	2	248	156	2	340	184
3	1	44	98	1	124	132	1½	166	138	1½	253	169	2	306	173	2½	370	180
3½	1	44	94	1	116	121	1½	166	131	1½	254	157	2	313	164	2½	382	172
4	1	52	98	1	146	131	1½	200	141	2	255	149	2	364	178	2½	436	185
4½	1	49	95	1	138	122	1½	196	133	2	256	142	2	365	168	2½	437	174
5	1	63	99	1	177	134	1½	238	144	2	301	153	2	429	183	2½	501	188
6	1	77	101	1½	161	119	1½	284	148	2	346	155	2	493	187	2½	582	195
7	1½	62	93	1½	175	118	1½	309	147	2	386	156	2½	470	166	2½	644	197
8	1½	69	94	1½	194	118	1½	342	148	2	423	157	2½	500	163	3	608	174
9	1½	75	94	1½	212	118	1½	372	148	2	443	153	2½	544	164	3	659	175
10	1½	80	93	1½	226	117	2	321	130	2½	422	141	2½	602	167	3½	661	166
11	1½	87	94	1½	246	118	2	350	131	2½	462	143	2½	660	170	3½	711	167
12	1½	93	93	1½	262	118	2	382	132	2½	494	144	2½	706	171	3½	758	168
14	1½	111	95	1½	311	123	2	434	136	2½	556	148	2½	793	177	3½	839	173
16	1½	126	95	1½	354	123	2	492	137	2½	627	150	2½	894	179	3½	940	175
18	1½	140	96	1½	394	124	2	546	138	2½	694	150	3	855	163	3½	1036	177
20	1½	154	96	1½	434	124	2	600	138	2½	761	151	3	936	164	3½	1133	178
24	1½	183	96	1½	514	124	2	708	139	2½	896	152	3	1098	165	3½	1325	180

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OWENS-CORNING FIBERGLAS CORPORATION
Industrial and Commercial Construction Materials Division
717 Fifth Avenue, New York, New York 10022 • General Offices, Toledo, Ohio 43601

FIBERGLAS

Engineering Data 10.E.8

Date May, 1967

engineering data

KAYLO & KAYLO 20 THICKNESS STANDARDS, NESTING SIZES

Kaylo & Kaylo 20 Pipe Insulations are precision molded to fit nominal iron pipe sizes from ⅛" to 39" in diameter, single or double-layer thicknesses. Single layer thicknesses are 1" and 1½", double layer from 1" to 3" in half-sectional or multisegmental form depending on pipe size.

Single layer sectional covering is available for copper tubing sizes from ⅜" to 3" sizes and in thicknesses from 1" to 1½".

Kaylo in single layer, double layer or multiple layer thicknesses is designed in accordance with the Simplified Dimensional Standards to allow accurate nesting. Double or multiple layer application with staggered joints is recommended to reduce leakage at the joints where operating temperatures exceed 600°F. See Product Data Sheet 5.3 for Economic Thicknesses recommendations.

KEY

IP	Iron Pipe Sizes
CT	Copper Tubing
IL	Inner Layer
OL	Outer Layer

(copper tubing size table)

note

Insulation for tubing sizes other than standard sizes shown are available only as cut downs from next larger size tube or pipe and will be slightly elliptical in shape.

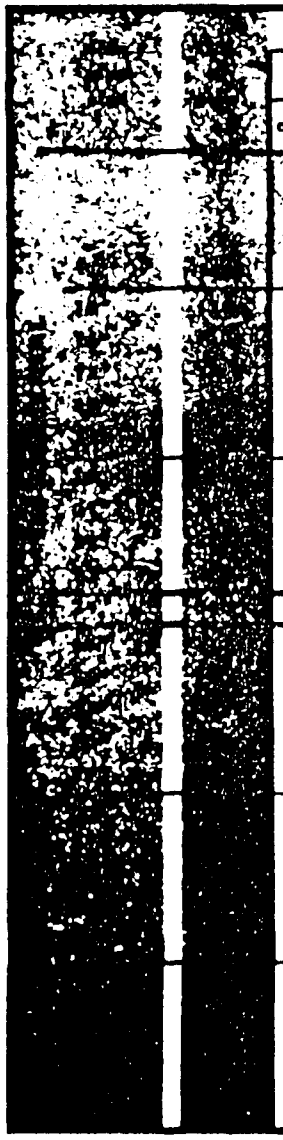
INSULATION THICKNESS STANDARDS & NESTING SIZES

nom. tube size	O. D. of tube (nom.)	single layer			
		nom. 1"		nom. 1½"	
		actual	O.D.	actual	O.D.
⅜"	⅞"	1.18	2.88	1.49	3.50
½"	⅞"	1.11	2.88	1.87	3.50
⅝"	⅞"	1.05	2.88	1.61	4.00
¾"	⅞"	.99	2.88	1.55	4.00
1"	1⅛"	1.17	3.50	1.87	4.00
1¼"	1⅜"	1.05	3.50	1.55	4.50
1½"	1⅝"	1.17	4.00	1.87	4.50
2"	2⅛"	.91	4.00	1.41	5.00
2½"	2⅝"	.91	4.50	1.45	5.56
3"	3⅛"	.91	5.00	1.73	6.66

single layer only				single or double layer						multiple layer—recommended combinations							
nom. 1"		nom. 1½"		nom. 2"		nom. 2½"		nom. 3"		2"	2½"	3"	3½"	4"	4½"	5"	6"
										IL	IL	IL	IL	IL	IL	IL	IL
actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	OL	OL	OL	OL	OL	OL	OL	OL
1.884	2.88	1.66	4.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1.00	2.88	1.56	4.00	2.06	5.00	2.89	6.66	3.39	7.66	1½ x1	1½ x1	1½ x1½	1½ x1½	1½ x2	1½ x2	1½ x2½	1½ x3
										2½ x1	2½ x1½	3½ x1½	3½ x2	4½ x2	4½ x2½	6 x2½	7 x3
.90	2.88	1.46	4.00	1.96	5.00	2.79	6.66	3.29	7.66	¾ x1	¾ x1½	¾ x1½	¾ x1½	¾ x2	¾ x2	¾ x2½	¾ x3
1.08	3.50	1.58	4.50	2.11	5.56	2.66	6.66	3.16	7.66	2½ x1	2½ x1½	3½ x1½	3½ x2	4½ x2	4½ x2½	6 x2½	7 x3
										1 x1	1 x1½	1 x1½	1 x1½	1 x2	1 x2	1 x2½	1 x3
.90	3.50	1.66	5.00	1.94	5.56	2.48	6.66	2.98	2.66	3 x1	3 x1½	4 x1½	4 x2	5 x2	5 x2½	6 x2½	7 x3
										1¼ x1	1¼ x1½	1¼ x1½	1¼ x2	1¼ x2	1¼ x2½	1¼ x2½	1¼ x3
1.03	4.00	1.53	5.00	2.36	6.66	2.86	7.66	3.36	8.66	3 x1	3 x1½	4½ x1½	4½ x2	5 x2	5 x2½	6 x2½	7 x3
										1½ x1	1½ x1½	1½ x1½	1½ x2	1½ x2	1½ x2½	1½ x2½	1½ x3
										3½ x1	3½ x1½	4½ x1½	4½ x2	6 x2	6 x2½	7 x2½	8 x3
1.04	4.50	1.57	5.56	2.12	6.66	2.62	7.66	3.12	8.66	2 x1	2 x1	2 x1½	2 x1½	2 x2	2 x2	2 x2½	2 x3
										4 x1	4 x1½	5 x1½	5 x2	6 x2	6 x2½	7 x2½	8 x3
1.04	5.00	1.87	6.66	2.37	7.66	2.87	8.66	3.37	9.66	2½ x1	2½ x1½	2½ x1½	2½ x2	2½ x2	2½ x2	2½ x2½	2½ x3
										4½ x1	4½ x1½	6 x1½	6 x2	7 x2	7 x2½	8 x2½	9 x3
1.00	5.56	1.55	6.66	2.05	7.66	2.55	8.66	3.05	9.66	3 x1	3 x1	3 x1½	3 x1½	3 x2	3 x2	3 x2½	3 x3
										5 x1	5 x1½	6 x1½	6 x2	7 x2	7 x2½	8 x2½	9 x3
1.30	6.66	1.80	7.66	2.30	8.66	2.80	9.66	3.36	10.78	3½ x1	3½ x1½	3½ x1½	3½ x2	3½ x2	3½ x2	3½ x2½	3½ x3
										6 x1	6 x1½	7 x1½	7 x2	8 x2	8 x2½	9 x2½	10 x3
1.05	6.66	1.55	7.66	2.05	8.66	2.55	9.66	3.11	10.78	4 x1	4 x1	4 x1½	4 x1½	4 x2	4 x2	4 x2½	4 x3
										6 x1	6 x1½	7 x1½	7 x2	8 x2	8 x2½	9 x2½	10 x3
1.30	7.66	1.80	8.66	2.30	9.66	2.86	10.78	3.36	11.78		4½ x1	4½ x1½	4½ x1½	4½ x2	4½ x2	4½ x2½	4½ x3
											7 x1½	8 x1½	8 x2	9 x2	9 x2½	10 x2½	11 x3
1.02	7.66	1.52	8.66	2.02	9.66	2.52	10.78	3.08	11.78		5 x1	5 x1½	5 x1½	5 x2	5 x2	5 x2½	5 x3
											7 x1½	8 x1½	8 x2	9 x2	9 x2½	10 x2½	11 x3
.85	8.66	1.45	9.66	2.02	10.78	2.52	11.78	3.03	12.81		6 x1	6 x1½	6 x1½	6 x2	6 x2	6 x2½	6 x3
											8 x1½	8 x1½	8 x2	9 x2	10 x2	10 x2½	11 x3
		1.52	10.78	2.02	11.78	2.53	12.81	3.16	14.06			9 x1½	9 x2	10 x2	10 x2½	11 x2½	12 x3
												7 x1½	7 x2	7 x2	7 x2½	7 x2½	7 x3
		1.52	11.78	2.03	12.81	2.66	14.06	3.16	15.06			10 x1½	10 x2	11 x2	11 x2½	12 x2½	14 x3
												8 x1½	8 x2	8 x2	8 x2½	8 x2½	8 x3
												11 x1½	11 x2	12 x2	12 x2½	14 x2½	15 x3
		1.53	12.81	2.16	14.06	2.66	15.06	3.17	16.09			9 x1½	9 x1½	9 x2	9 x2	9 x2½	9 x3
												12 x1½	12 x2	14 x2	14 x2½	15 x2½	15 x3
		1.59	14.06	2.09	15.06	2.61	16.09										
		1.58	15.06	2.09	16.09												
		1.59	16.09														

engineering data

KAYLO & KAYLO 20 THICKNESS STANDARDS, NESTING SIZES



single layer only				single or double layer					
nom. 1"		nom. 1½"		nom. 2"		nom. 2½"		nom. 3"	
actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.
								3.06	17.00
						2.55	17.00	3.05	18.00
				2.05	17.00	2.55	18.00	3.05	19.00
		1.42	17.00	1.92	18.00	2.42	19.00	2.92	20.00
		1.42	18.00	1.92	19.00	2.41	20.00	2.92	21.00
		1.41	19.00	1.91	20.00	2.41	21.00	2.91	22.00
		1.41	20.00	1.91	21.00	2.41	22.00	2.91	23.00
		1.41	21.00	1.91	22.00	2.41	23.00	2.91	24.00
		1.41	22.00	1.91	23.00	2.41	24.00	2.91	25.00
		1.41	23.00	1.91	24.00	2.41	25.00	2.91	26.00
		1.41	24.00	1.91	25.00	2.41	26.00	2.91	27.00
		1.41	25.00	1.91	26.00	2.41	27.00	2.91	28.00
		1.41	26.00	1.91	27.00	2.41	28.00	2.91	29.00
		1.41	27.00	1.91	28.00	2.41	29.00	2.91	30.00
		1.46	28.00	1.98	29.00	2.50	30.00	3.02	31.00
		1.46	29.00	1.98	30.00	2.50	31.00	3.02	32.00
		1.46	30.00	1.98	31.00	2.50	32.00	3.02	33.00
		1.46	31.00	1.98	32.00	2.50	33.00	3.02	34.00
		1.46	32.00	1.98	33.00	2.50	34.00	3.02	35.00
		1.46	33.00	1.98	34.00	2.50	35.00	3.02	36.00
		1.46	34.00	1.98	35.00	2.50	36.00	3.02	37.00
		1.46	35.00	1.98	36.00	2.50	37.00	3.02	38.00
		1.46	36.00	1.98	37.00	2.50	38.00	3.02	39.00
		1.46	37.00	1.98	38.00	2.50	39.00	3.02	40.00
		1.46	38.00	1.98	39.00	2.50	40.00	3.02	41.00
		1.46	39.00	1.98	40.00	2.50	41.00	3.02	42.00
		1.46	40.00	1.98	41.00	2.50	42.00	3.02	43.00
		1.46	41.00	1.98	42.00	2.50	43.00	3.02	44.00
		1.46	42.00	1.98	43.00	2.50	44.00	3.02	45.00

multiple layer—recommended combinations

2"	2½"	3"	3½"	4"	4½"	5"	6"
IL	IL	IL	IL	IL	IL	IL	IL
OL	OL	OL	OL	OL	OL	OL	OL
		10 x1½	10 x1½	10 x2	10 x2	10 x2½	10 x3
		14 x1½	14 x2	15 x2	15 x2½	16 x2½	17 x3
		11 x1½	11 x1½	11 x2	11 x2	11 x2½	11 x3
		15 x1½	15 x2	16 x2	16 x2½	17 x2½	18 x3
		12 x1½	12 x1½	12 x2	12 x2	12 x2½	12 x3
		16 x1½	16 x2	17 x2	17 x2½	18 x2½	19 x3
		13 x1½	13 x1½	13 x2	13 x2	13 x2½	13 x3
		17 x1½	17 x2	18 x2	18 x2½	19 x2½	20 x3
		15 x1½	15 x1½	15 x2	15 x2	15 x2½	15 x3
		18 x1½	18 x2	19 x2	19 x2½	20 x2½	21 x3
		16 x1½	16 x1½	16 x2	16 x2	16 x2½	16 x3
		19 x1½	19 x2	20 x2	20 x2½	21 x2½	22 x3
		17 x1½	17 x1½	17 x2	17 x2	17 x2½	17 x3
		20 x1½	20 x2	21 x2	21 x2½	22 x2½	23 x3
		18 x1½	18 x1½	18 x2	18 x2	18 x2½	18 x3
		21 x1½	21 x2	22 x2	22 x2½	23 x2½	24 x3
		19 x1½	19 x1½	19 x2	19 x2	19 x2½	19 x3
		22 x1½	22 x2	23 x2	23 x2½	24 x2½	25 x3A
		20 x1½	20 x1½	20 x2	20 x2	20 x2½	20 x3
		23 x1½	23 x2	24 x2	24 x2½	25 x2½A	26 x3A
		21 x1½	21 x1½	21 x2	21 x2	21 x2½	21 x3
		24 x1½	24 x2	25 x2A	25 x2A	26 x2½A	27 x3A
		22 x1½	22 x1½	22 x2	22 x2	22 x2½	22 x3
		25 x1½A	25 x2 A	26 x2A	26 x2½A	27 x2½A	28 x3A
		23 x1½	23 x1½	23 x2	23 x2	23 x2½	23 x3
		26 x1½A	26 x2 A	27 x2A	27 x2½A	28 x2½A	29 x3A
		24 x1½	24 x1½	24 x2	24 x2	24 x2½	24 x3
		27 x1½A	27 x2 A	28 x2A	28 x2½A	29 x2½A	30 x3A
		25 x1½A	25 x1½A	25 x2A	25 x2 A	25 x2½A	25 x3A
		28 x1½B	28 x2 B	29 x2B	29 x2½B	30 x2½B	31 x3B
		26 x1½A	26 x1½A	26 x2A	26 x2 A	26 x2½A	26 x3A
		29 x1½B	29 x2 B	30 x2B	30 x2½B	31 x2½B	32 x3B
		27 x1½A	27 x1½A	27 x2A	27 x2 A	27 x2½A	27 x3A
		30 x1½B	30 x2 B	31 x2B	31 x2½B	32 x2½B	33 x3B
		28 x1½A	28 x1½A	28 x2A	28 x2 A	28 x2½A	28 x3A
		31 x1½B	31 x2 B	32 x2B	32 x2½B	33 x2½B	34 x3B
		29 x1½A	29 x1½A	29 x2A	29 x2 A	29 x2½A	29 x3A
		32 x1½B	32 x2 B	33 x2B	33 x2½B	34 x2½B	35 x3B
		30 x1½B	30 x1½B	30 x2B	30 x2 B	30 x2½B	30 x3B
		33 x1½C	33 x2 C	34 x2C	34 x2½C	35 x2½C	36 x3C
		31 x1½B	31 x1½B	31 x2B	31 x2 B	31 x2½B	31 x3B
		34 x1½C	34 x2 C	35 x2C	35 x2½C	36 x2½C	37 x3C
		32 x1½B	32 x1½B	32 x2B	32 x2 B	32 x2½B	32 x3B
		35 x1½C	35 x2 C	36 x2C	36 x2½C	37 x2½C	38 x3C
		33 x1½B	33 x1½B	33 x2B	33 x2 B	33 x2½B	33 x3B
		36 x1½C	36 x2 C	37 x2C	37 x2½C	38 x2½C	39 x3C
		34 x1½B	34 x1½B	34 x2B	34 x2 B	34 x2½B	34 x3B
		37 x1½C	37 x2 C	38 x2C	38 x2½C	39 x2½C	40 x3C

...olution for the nominal pipe sizes range of 25"-39" is furnished in three K-Segmental curvatures ...es. Approximately six to eight segments are required to enclose pipes in this size range. The ...d segment applied must be cut to fit accurately. Letter designation molded K-Segmental size ... proper nesting.

...Note: All single layer tri-seg. and quad-seg. sizes shown are also available in sectional form ...-segmental is not available in a fabricated sectional form.

K-Segmental Dimensions:

Letter	In. Dia.	O. Dia.	Approx. Outer Arc
A	26.00"	31.00"	14"
B	31.00"	36.00"	16"
C	36.00"	41.00"	18"

OWENS-CORNING FIBERGLAS CORPORATION
Industrial Materials Division
Fiberglas Tower, Toledo, Ohio 43601

...in U.S.A. 5/67

OWENS CORNING FIBERGLAS

engineering · data

Engineering Data 10.E 8
April 1970

Kaylo 10 & Kaylo 20 Thickness Standards, Nesting Sizes

Kaylo Pipe Insulations are precision molded to fit nominal iron pipe sizes from ⅛" to 30" in diameter, single or double-layer thicknesses. Single layer thicknesses are 1" and 1½", double layer from 1" to 3" in half-sectional or multi-segmental form depending on pipe size.

Single layer sectional covering is available for copper tubing sizes from ⅜" to 3" sizes and in thicknesses from 1" to 1½".

Kaylo in single layer, double layer or multiple layer thicknesses is designed in accordance with the Simplified Dimensional Standards to allow accurate nesting. Double or multiple layer application with staggered joints is recommended to reduce leakage at the joints where operating temperatures exceed 600°F. See Product Data Sheet 5.3 for Economic Thicknesses recommendations.

KEY

IP = Iron Pipe Sizes
CT = Copper Tubing
IL Inner Layer
OL Outer Layer
(copper tubing size table)

note

Insulation for tubing sizes other than standard sizes shown are available only as cut downs from next larger size tube or pipe and will be slightly elliptical in shape.

INSULATION THICKNESS STANDARDS & NESTING SIZES

nom. tube size	O. D. of tube (nom.)	single layer			
		nom. 1"		nom. 1½"	
		actual	O.D.	actual	O.D.
⅜"	⅞"	1.18	2.88	1.69	3.50
½"	⅞"	1.11	2.88	1.62	3.50
⅝"	⅞"	1.05	2.88	1.61	4.00
¾"	⅞"	.99	2.88	1.55	4.00
1"	1⅛"	1.17	3.50	1.62	4.00
1¼"	1⅜"	1.05	3.50	1.55	4.50
1½"	1⅝"	1.17	4.00	1.62	4.50
2"	2⅛"	.91	4.00	1.61	5.00
2½"	2⅝"	.91	4.50	1.65	5.56
3"	3⅛"	.91	5.00	1.73	6.66

single layer only				single or double layer						multiple layer—recommended combinations							
nom. 1"		nom. 1½"		nom. 2"		nom. 2½"		nom. 3"		2"	2½"	3"	3½"	4"	4½"	5"	6"
										IL	IL	IL	IL	IL	IL	IL	IL
actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	OL	OL	OL	OL	OL	OL	OL	OL
1.084	2.88	1.65	4.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1.00	2.88	1.56	4.00	2.06	5.00	2.89	6.66	3.39	7.66	2½x1	2½x1½	3½x1½	3½x2	4½x2	4½x2½	6 x2½	7 x3
.90	2.88	1.46	4.00	1.96	5.00	2.79	6.66	3.29	7.66	3 x1	3 x1½	4 x1½	4 x2	5 x2	5 x2½	6 x2½	7 x3
1.08	3.50	1.58	4.50	2.11	5.56	2.66	6.66	3.16	7.66	2½x1	2½x1½	3½x1½	3½x2	4½x2	4½x2½	6 x2½	7 x3
.90	3.50	1.66	5.00	1.94	5.56	2.48	6.66	2.98	7.66	3 x1	3 x1½	4½x1½	4½x2	5 x2	5 x2½	6 x2½	7 x3
1.03	4.00	1.53	5.00	2.36	6.66	2.86	7.66	3.36	8.66	3½x1	3½x1½	4½x1½	4½x2	6 x2	6 x2½	7 x2½	8 x3
1.04	4.50	1.57	5.56	2.12	6.66	2.62	7.66	3.12	8.66	2 x1	2 x1½	2 x1½	2 x2	2 x2	2 x2½	2 x2½	2 x3
1.04	5.00	1.87	6.66	2.37	7.66	2.87	8.66	3.37	9.66	4 x1	4 x1½	5 x1½	5 x2	6 x2	6 x2½	7 x2½	8 x3
1.00	5.56	1.55	6.66	2.05	7.66	2.55	8.66	3.05	9.66	2½x1	2½x1½	3½x1½	3½x2	4½x2	4½x2½	6 x2½	7 x3
1.30	6.66	1.80	7.66	2.30	8.66	2.80	9.66	3.36	10.78	3 x1	3 x1½	4 x1½	4 x2	5 x2	5 x2½	6 x2½	7 x3
1.05	6.66	1.55	7.66	2.05	8.66	2.55	9.66	3.11	10.78	3½x1	3½x1½	4½x1½	4½x2	6 x2	6 x2½	7 x2½	8 x3
1.30	7.66	1.80	8.66	2.30	9.66	2.86	10.78	3.36	11.78	4 x1	4 x1½	5 x1½	5 x2	6 x2	6 x2½	7 x2½	8 x3
1.02	7.66	1.52	8.66	2.02	9.66	2.58	10.78	3.08	11.78	6 x1	6 x1½	7 x1½	7 x2	8 x2	8 x2½	9 x2½	10 x3
.95	8.66	1.45	9.66	2.02	10.78	2.52	11.78	3.03	12.81	4½x1	4½x1½	4½x2	4½x2½	6 x2	6 x2½	7 x2½	8 x3
		1.52	10.78	2.02	11.78	2.53	12.81	3.16	14.06	7 x1	7 x1½	8 x1½	8 x2	9 x2	9 x2½	10 x2½	11 x3
		1.52	11.78	2.03	12.81	2.66	14.08	3.16	15.06	8 x1	8 x1½	9 x1½	9 x2	10 x2	10 x2½	11 x2½	12 x3
		1.53	12.81	2.16	14.06	2.66	15.06	3.17	16.09	9 x1	9 x1½	10 x1½	10 x2	11 x2	11 x2½	12 x2½	13 x3
		1.59	14.06	2.09	15.06	2.61	16.09			10 x1	10 x1½	11 x1½	11 x2	12 x2	12 x2½	14 x2½	15 x3
		1.58	15.06	2.09	16.09					8 x1½	8 x2	8 x2½	8 x3				
		1.59	16.09							11 x1½	11 x2	12 x2	12 x2½	14 x2½	15 x3		
										9 x1½	9 x1½	9 x2	9 x2	9 x2½	9 x3		
										12 x1½	12 x2	14 x2	14 x2½	15 x2½	16 x3		

KAYLO 10 & KAYLO 20 THICKNESS STANDARDS, NESTING SIZES



single layer only				single or double layer					
nom. 1"		nom. 1½"		nom. 2"		nom. 2½"		nom. 3"	
actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.
								3.06	17.00
						2.55	17.00	3.05	18.00
				2.05	17.00	2.55	18.00	3.05	19.00
		1.42	17.00	1.92	18.00	2.42	19.00	2.92	20.00
		1.42	18.00	1.92	19.00	2.41	20.00	2.92	21.00
		1.41	19.00	1.91	20.00	2.41	21.00	2.91	22.00
		1.41	20.00	1.91	21.00	2.41	22.00	2.91	23.00
		1.41	21.00	1.91	22.00	2.41	23.00	2.91	24.00
		1.41	22.00	1.91	23.00	2.41	24.00	2.91	25.00
		1.41	23.00	1.91	24.00	2.41	25.00	2.91	26.00
		1.41	24.00	1.91	25.00	2.41	26.00	2.91	27.00
		1.41	25.00	1.91	26.00	2.41	27.00	2.91	28.00
		1.41	26.00	1.91	27.00	2.41	28.00	2.91	29.00
		1.41	27.00	1.91	28.00	2.41	29.00	2.91	30.00
		1.46	28.00	1.98	29.00	2.50	30.00	3.02	31.00
		1.46	29.00	1.98	30.00	2.50	31.00	3.02	32.00
		1.46	30.00	1.98	31.00	2.50	32.00	3.02	33.00
		1.46	31.00	1.98	32.00	2.50	33.00	3.02	34.00
		1.46	32.00	1.98	33.00	2.50	34.00	3.02	35.00
		1.46	33.00	1.98	34.00	2.50	35.00	3.02	36.00
		1.46	34.00	1.98	35.00	2.50	36.00	3.02	37.00
		1.46	35.00	1.98	36.00	2.50	37.00	3.02	38.00
		1.46	36.00	1.98	37.00	2.50	38.00	3.02	39.00
		1.46	37.00	1.98	38.00	2.50	39.00	3.02	40.00
		1.46	38.00	1.98	39.00	2.50	40.00	3.02	41.00
		1.46	39.00	1.98	40.00	2.50	41.00	3.02	42.00
		1.46	40.00	1.98	41.00	2.50	42.00	3.02	43.00
		1.46	41.00	1.98	42.00	2.50	43.00	3.02	44.00
		1.46	42.00	1.98	43.00	2.50	44.00	3.02	45.00

multiple layer—recommended combinations

2"	2½"	3"	3½"	4"	4½"	5"	6"
IL	IL	IL	IL	IL	IL	IL	IL
OL	OL	OL	OL	OL	OL	OL	OL
		10 x1½	10 x1½	10 x2	10 x2	10 x2½	10 x3
		14 x1½	14 x2	15 x2	15 x2½	16 x2½	17 x3
		11 x1½	11 x1½	11 x2	11 x2	11 x2½	11 x3
		15 x1½	15 x2	16 x2	16 x2½	17 x2½	18 x3
		12 x1½	12 x1½	12 x2	12 x2	12 x2½	12 x3
		16 x1½	16 x2	17 x2	17 x2½	18 x2½	19 x3
		14 x1½	14 x1½	14 x2	14 x2	14 x2½	14 x3
		17 x1½	17 x2	18 x2	18 x2½	19 x2½	20 x3
		15 x1½	15 x1½	15 x2	15 x2	15 x2½	15 x3
		18 x1½	18 x2	19 x2	19 x2½	20 x2½	21 x3
		16 x1½	16 x1½	16 x2	16 x2	16 x2½	16 x3
		19 x1½	19 x2	20 x2	20 x2½	21 x2½	22 x3
		17 x1½	17 x1½	17 x2	17 x2	17 x2½	17 x3
		20 x1½	20 x2	21 x2	21 x2½	22 x2½	23 x3
		18 x1½	18 x1½	18 x2	18 x2	18 x2½	18 x3
		21 x1½	21 x2	22 x2	22 x2½	23 x2½	24 x3
		19 x1½	19 x1½	19 x2	19 x2	19 x2½	19 x3
		22 x1½	22 x2	23 x2	23 x2½	24 x2½	25 x3A
		20 x1½	20 x1½	20 x2	20 x2	20 x2½	20 x3
		23 x1½	23 x2	24 x2	24 x2½	25 x2½A	26 x3A
		21 x1½	21 x1½	21 x2	21 x2	21 x2½	21 x3
		24 x1½	24 x2	25 x2A	25 x2A	26 x2½A	27 x3A
		22 x1½	22 x1½	22 x2	22 x2	22 x2½	22 x3
		25 x1½A	25 x2 A	26 x2A	26 x2½A	27 x2½A	28 x3A
		23 x1½	23 x1½	23 x2	23 x2	23 x2½	23 x3
		26 x1½A	26 x2 A	27 x2A	27 x2½A	28 x2½A	29 x3A
		24 x1½	24 x1½	24 x2	24 x2	24 x2½	24 x3
		27 x1½A	27 x2 A	28 x2A	28 x2½A	29 x2½A	30 x3A
		25 x1½A	25 x1½A	25 x2A	25 x2 A	25 x2½A	25 x3A
		28 x1½B	28 x2 B	29 x2B	29 x2½B	30 x2½B	31 x3B
		26 x1½A	26 x1½A	26 x2A	26 x2 A	26 x2½A	26 x3A
		29 x1½B	29 x2 B	30 x2B	30 x2½B	31 x2½B	32 x3B
		27 x1½A	27 x1½A	27 x2A	27 x2 A	27 x2½A	27 x3A
		30 x1½B	30 x2 B	31 x2B	31 x2½B	32 x2½B	33 x3B
		28 x1½A	28 x1½A	28 x2A	28 x2 A	28 x2½A	28 x3A
		31 x1½B	31 x2 B	32 x2B	32 x2½B	33 x2½B	34 x3B
		29 x1½A	29 x1½A	29 x2A	29 x2 A	29 x2½A	29 x3A
		32 x1½B	32 x2 B	33 x2B	33 x2½B	34 x2½B	35 x3B
		30 x1½B	30 x1½B	30 x2B	30 x2 B	30 x2½B	30 x3B
		33 x1½C	33 x2 C	34 x2C	34 x2½C	35 x2½C	36 x3C
		31 x1½B	31 x1½B	31 x2B	31 x2 B	31 x2½B	31 x3B
		34 x1½C	34 x2 C	35 x2C	35 x2½C	36 x2½C	37 x3C
		32 x1½B	32 x1½B	32 x2B	32 x2 B	32 x2½B	32 x3B
		35 x1½C	35 x2 C	36 x2C	36 x2½C	37 x2½C	38 x3C
		33 x1½B	33 x1½B	33 x2B	33 x2 B	33 x2½B	33 x3B
		36 x1½C	36 x2 C	37 x2C	37 x2½C	38 x2½C	39 x3C
		34 x1½B	34 x1½B	34 x2B	34 x2 B	34 x2½B	34 x3B
		37 x1½C	37 x2 C	38 x2C	38 x2½C	39 x2½C	40 x3C

NOTE: Insulation for the nominal pipe sizes range of 35"-39" is furnished in three K Segmental curvature sizes. Approximately six to eight segments are required to enclose pipes in this size range. The last segment applied must be cut to fit concentrically. Letter designated mold from which K Seg. sizes are made. (See K Segmental Dimensions) for proper nesting.

K Segmental pieces from the same curvature range, i.e. letter C, cannot be nested with each other.

*Note: All single layer tri-seg sizes shown are also available in sectional form. K segmental is not available in a fabricated sectional form.

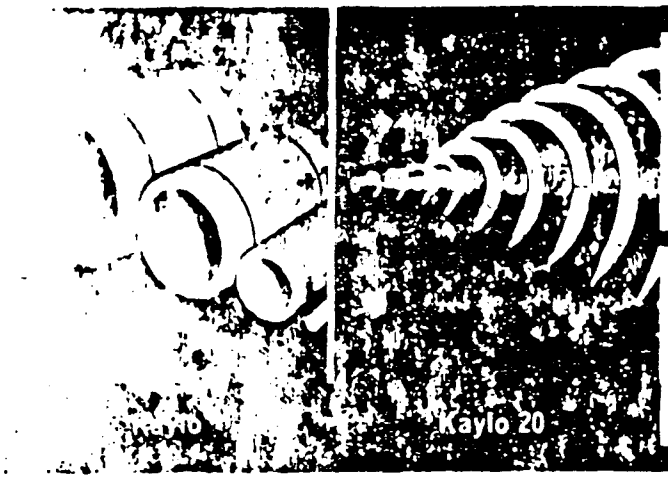
OWENS-CORNING FIBERGLAS CORPORATION
Industrial Materials Division
Fiberglas Tower, Toledo, Ohio 43601

K-Segmental Dimensions:

Letter	In. Dia.	O. Dia.	Approx. Outer Arc
A	26.00"	31.00"	14"
B	31.00"	36.00"	16"
C	36.00"	41.00"	18"

Printed in U.S.A. April 1976 Pub. No. 4-BB-8198-A

Pipe Insulation



Kaylo & Kaylo 20 Pipe Insulations

rigid hydrous calcium silicate pipe insulations for heated piping up to 1800F.

uses

Standard Kaylo is recommended for use on heated piping operating up to 1200F and Kaylo 20 extends the temperature range to 1800F. These thoroughly field-tested insulations have the physical properties most desirable for efficient, durable work for indoor and outdoor, power and process piping. A variety of jackets are available for surface finish and weatherproofing.

description

Kaylo® & Kaylo 20® pipe insulations are rigid hydrous calcium silicate heat insulations for use on all heated piping up to 1800F — indoors and out. These products are precision molded in sections or segments from a chemical reacted material. A small amount of asbestos fiber is added to improve mechanical strength. Kaylo is white. Kaylo 20 has a slight pinkish color to distinguish it from Kaylo.

benefits

lower operating costs — Kaylo Insulations have exceptional thermal efficiency. The low k factor of .37 at 200 mean temperature means lower operating cost, better temperature control for process operations.

rugged — Kaylo Pipe Insulations are strong and rigid to resist mechanical abuse in shipping, handling and in service.

versatile — Kaylo's extended temperature range covers a broad number of uses with one material. All heated piping requirements to 1800F and in sizes from ... to 30" IPS can be met with Kaylo and Kaylo 20.

will not cause stress corrosion cracking — Kaylo will not cause stress corrosion cracking of stainless ... because Kaylo contains an inhibitor, and has ... of soluble chlorides.

unaffected by moisture — Kaylo can be completely saturated in water without appreciable loss of strength and regains its strength and thermal value after drying out.

clean, neat installation — Kaylo cuts cleanly leaving a sharp square edge for neater appearance on fittings. Rigid manufacturing tolerances assure uniform, smooth, unbroken joints.

variety of jackets — A variety of factory-applied jackets allows a selection of product for indoor finished appearance or for weatherproofing insulation on outdoor lines.

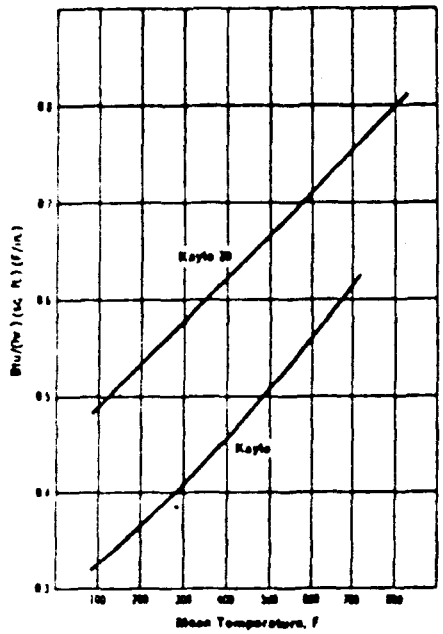
nesting sizes — Kaylo and Kaylo 20 Pipe Insulations are manufactured to Simplified Dimensional Standards to permit nesting sizes for double layer applications.

REG. PAT. OFF.

physical properties

	Kaylo	Kaylo 20
density approximately	11 lb. pcf.	12 lb. pcf.
flexural strength (ASTM C-203)	50 lbs./sq. in.	90 lbs./sq. in.
compressive strength (ASTM C-165) at 5% deformation	120 psi	130 psi
resistance to abrasion (Conventional tumbling test-loss in weight after 20 min.) before heating	9%	3%
after heating for 24 hr. at	750° — 5%	1200F — 5%
at	1000° — 4%	1800F — 20%
at	1200° — 3%	
alkalinity	ph 10	ph 10
corrosion resistance	does not cause or accelerate corrosion of steel, aluminum or stainless steel	
dimensional stability linear shrinkage after heating for 24 hrs. in a muffle at	750° — 0.8%	1200° — 0.7%
at	1000° — 0.9%	1800° — 1.6%
at	1200° — 1.4%	
specific heat	0.22 btu/lb.F	0.22 btu/lb.F
thermal *diffusivity* sq. ft./hr. at 200F mean Temp.	0.012	0.016

thermal conductivity



sizes

thickness — Kaylo Pipe Insulation is available in single or double layer thicknesses from 1" to 3" depending upon pipe size. Kaylo Tube Insulation is available in single layer thicknesses of 1" and 1½".

pipe sizes — Kaylo Pipe Insulation is available to fit nominal pipe sizes from ½" to 30" in diameter. Kaylo Tube Insulation will fit nominal copper tubing sizes from ⅜" to 3" in diameter.

forms — Kaylo Pipe Insulation is available in sectional or multisegmental form depending upon pipe size. All insulation is furnished in 3 ft. sections.

jackets

canvas — Kaylo Sectional Pipe Insulation includes standard canvas jackets, at no additional charge, on thicknesses up to and including 3", depending on pipe size. Standard canvas is available for segmental forms at a slight additional cost. Bands are available for use with this product at slight additional charge and will be furnished on request.

6 oz. and 8 oz. canvas jackets are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms, they are furnished but not adhered.

Kaylo Klad — Kaylo is also available with an embossed aluminum jacket .016" thick or .010" thick stainless steel jacket. These jackets provide greater resistance to mechanical damage and present a neat finished appearance to pipe lines. The longitudinal seam has a self-locking joint. Butt sealing strip with integral mastic and protective asbestos cover are furnished for sealing end joints. See data sheet—for complete information on Kaylo Klad.

federal specification compliance

HH-I-558B — Insulation Block and Pipe Covering, Thermal (Calcium Silicate for Temperatures up to 1200F) Type II (pipe insulation) Class A thru E.

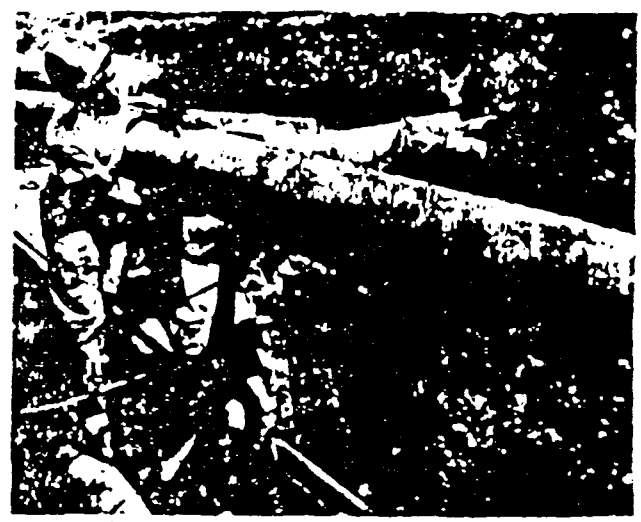
MIL-I-2781D (Int. Amend. 1) — Insulation Pipe Covering, Thermal, Grade I, Class b; Grade II, Class d, Grade III, Class e, Type I & II.

application recommendations

outdoor lines — Kaylo Pipe Insulations are mechanically fastened by wiring in place using 16 gauge wire on 9" centers and subsequently covered with a weatherproof jacket of metal or 45 lb. roofing felt. See Application Specifications for complete details.

indoor lines — Kaylo for indoor piping work is furnished with a factory-applied canvas jacket and held in place with bands or wire. The jacket has overlapping joint flaps that are smoothly pasted in place. Canvas should be sized to provide a base for painting.

fittings — Fitting are insulated with mitered segments of Kaylo wired in place and finished with a ¼" layer of insulating cement. Flanges and valves are insulated with oversized pipe insulation. They are finished off with canvas pasted in place for indoor lines or reinforced waterproof mastic for outdoor lines.



economic thickness

Selection of insulation thicknesses for any specific application should take into consideration the following important criteria: 1. Cost of insulation applied. 2. Cost of heat energy. 3. Cost of capital. 4. Cost of depreciation—plant and insulation. 5 Capital investment in heat production equipment. 6. Temperature differential. 7. Size of the pipe or surface. 8. Conductivity of insulation.

for hot piping, the tabulated thicknesses are optimum thicknesses calculated on an "Economic"* basis for heat conservation under average operating conditions and assures adequate temperature control. Special conditions may warrant the use of other thicknesses.

**From "How to Determine Economic Thickness of Insulation"—National Insulation Manufacturers Association.*

economic thickness — kaylo pipe insulation — power & utility piping

(80F ambient air)

PIPE TEMP.		200			400			600			800			1000			1200	
TEMP. DIFF.		120			320			520			720			920			1120	
IPS	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST
[illegible]	1	15	94	1	47	122	1½	71	126	1½	105	148	2	132	149	2½	151	139
¼	1	18	97	1	57	132	1½	81	133	2	106	135	2	150	158	2½	170	146
1	1	19	95	1	59	124	1½	88	131	2	116	134	2½	146	137	3	177	139
1¼	1	25	99	1	76	135	1½	98	131	2	136	143	2½	159	137	3	205	142
1½	1	25	97	1½	63	113	1½	110	137	2½	123	121	2½	171	138	3	206	142
2	1	30	97	1½	71	113	1½	126	139	2½	144	128	2½	202	148	3	238	152
2½	1	36	98	1½	73	113	2	113	118	2½	153	128	3	197	133	3½	258	136
3	1	42	99	1½	93	117	2	140	123	2½	186	135	3	235	144	3½	278	147
3½	1	42	99	1½	94	117	2	143	124	3	173	121	3½	223	129	4	270	135
4	1	50	100	1½	113	118	2½	145	119	3	197	126	3½	248	135	4	300	141
4½	1	62	101	1½	120	118	2½	160	120	3	220	129	3½	260	137	4	322	143
5	1	70	102	1½	155	122	2½	187	122	3	250	131	3½	310	138	4	360	144
6	1	74	102	2	130	111	2½	194	123	3	260	132	3½	319	139	4½	358	137
7	1½	70	97	2	145	112	2½	214	123	3	268	133	3½	332	140	4½	398	139
8	1½	66	94	2	157	112	2½	228	123	3½	274	124	4	355	134	4½	430	142
9	1½	72	94	2	168	112	2½	242	124	3½	302	126	4	384	135	5	440	137
10	1½	78	94	2	184	112	3	245	118	3½	330	128	4	421	138	5	469	138
11	1½	84	94	2	205	114	3	263	118	3½	354	130	4	440	140	5	499	139
12	1½	90	94	2	229	115	3	282	118	4	335	122	4½	442	132	5	532	140
14	1½	108	96	2½	204	108	3	314	121	4	377	124	4½	485	135	5½	542	136
16	1½	124	96	2½	229	108	3	353	122	4	422	126	4½	541	136	5½	601	137
18	1½	137	96	2½	258	109	3	391	122	4	465	126	4½	594	136	5½	659	139
20	1½	151	96	2½	281	110	3	427	123	4	507	127	4½	648	138	5½	695	140
24	1½	179	96	2½	332	110	3½	442	117	4½	538	122	5	694	133	6	777	136

economic thickness — kaylo pipe insulation — process piping

(80F ambient air)

PIPE TEMP.		200			400			600			800			1000			1200	
TEMP. DIFF.		120			320			520			720			920			1120	
IPS	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST
¼		16	95	1	48	118	1	84	146	1	125	193	1	174	238	1½	189	203
¾	1	19	97	1	57	132	1	100	170	1	147	214	1	205	265	1½	218	221
1	1	20	97	1	60	125	1	105	158	1	156	196	1½	183	186	1½	237	217
1¼	1	26	98	1	76	129	1	132	178	1	196	224	1½	204	186	1½	263	217
1½	1	26	98	1	77	129	1	135	167	1½	164	165	1½	229	199	1½	295	230
2	1	31	98	1	89	132	1	158	171	1½	188	167	1½	262	202	2	288	182
2½	1	37	99	1	101	133	1½	129	130	1½	192	155	2	237	160	2	307	184
3	1	41	99	1	122	137	1½	165	144	1½	245	176	2	293	179	2½	334	183
3½	1	43	100	1	134	124	1½	166	136	1½	280	180	2	299	170	2½	343	174
4	1	51	100	1	144	136	1½	198	147	2	248	155	2	347	184	2½	393	185
4½	1	59	101	1	149	138	1½	201	154	2	258	158	2	361	188	2½	428	172
5	1	68	102	1	170	140	1½	242	158	2	304	159	2	400	190	2½	490	181
6	1	76	103	1½	160	123	1½	281	156	2	339	161	2	474	193	2½	524	195
7	1½	62	94	1½	176	123	1½	311	154	2	388	161	2½	465	167	2½	624	186
8	1½	68	95	1½	193	123	1½	340	155	2	412	163	2½	476	168	3	548	175
9	1½	74	95	1½	208	123	1½	376	155	2	445	163	2½	540	168	3	640	175
10	1½	80	95	1½	219	123	2	324	136	2½	411	147	2½	576	173	3½	596	166
11	1½	86	95	1½	240	124	2	360	138	2½	450	149	2½	626	175	3½	633	168
12	1½	92	95	1½	261	125	2	404	141	2½	482	150	2½	675	177	3½	679	169
14	1½	110	97	1½	307	127	2	432	142	2½	542	154	2½	757	183	3½	746	172
16	1½	125	97	1½	352	128	2	490	144	2½	610	156	2½	852	185	3½	868	174
18	1½	139	97	1½	392	128	2	543	144	2½	674	156	3	818	168	3½	933	177
20	1½	153	97	1½	431	129	2	598	145	2½	743	157	3	893	169	3½	1020	178
24	1½	185	97	1½	511	129	2	707	146	2½	872	158	3	1048	171	3½	1195	180

table key (ambient still air at 80F) ET — economic thickness; ST — surface temperature; HL — heat loss . . Btu/hr/lineal foot

economic thickness — kaylo pipe insulation — power & utility piping

(80F ambient air)

Temp. Pipe Size	1300			1400			1500			1600			1700			1800		
	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST
½	2½	221	157	2½	245	160	3	254	150	3	278	157	3	304	164	3½	313	156
¾	2½	243	156	3	252	148	3	278	155	3	305	162	3½	314	154	3½	342	161
1	2½	269	161	3	277	152	3	306	160	3½	316	152	3½	345	159	3½	375	166
1¼	3	279	149	3	310	157	3	342	165	3½	351	157	3½	384	164	3½	417	172
1½	3	294	153	3½	309	146	3½	362	160	3½	368	160	4	397	160	4	434	168
2	3	337	156	3½	347	150	3½	383	158	3½	421	165	4	432	159	4	469	166
2½	3	374	160	3½	385	154	3½	425	162	3½	466	170	4	476	163	4	518	171
3	3½	388	150	4	402	146	4	444	153	4½	458	150	4½	500	156	4½	545	163
3½	4	390	142	4	434	149	4	479	156	4½	494	152	4½	539	159	5	555	155
4	4	419	144	4	465	151	4½	481	148	4½	528	154	5	545	151	5	593	158
4½	4	446	145	4½	464	143	4½	512	150	5	530	147	5	579	153	5½	598	151
5	4½	449	138	4½	495	145	5	515	143	5	565	149	5½	585	147	5½	637	153
6	4½	502	141	5	523	140	5	578	146	5½	560	144	5½	655	150	6	678	149
7	4½	550	143	5	572	142	5	632	148	5½	655	147	6	679	146	6	738	151
8	5	560	137	5	622	143	5½	647	142	5½	710	149	6	735	148	6½	761	147
9	5	603	138	5½	630	138	5½	696	144	6	722	143	6	789	149	6½	817	149
10	5	653	140	5½	681	139	5½	752	146	6	779	145	6½	809	145	6½	880	150
11	5½	652	134	5½	724	140	6	754	140	6	829	146	6½	859	146	7	890	146
12	5½	693	135	5½	770	141	6	801	141	6½	834	141	6½	911	147	7	943	147
13	5½	742	136	6	776	137	6	857	143	6½	891	143	7	926	143	7	1007	148
14	6	772	132	6	858	138	6½	896	139	7	934	139	7	1020	144	7½	1058	145
15	6	844	133	6½	886	134	6½	978	140	7	1018	140	7½	1059	141	7½	1153	146
16	6	917	134	6½	960	135	6½	1060	141	7	1102	142	7½	1146	142	7½	1247	148
18	6	1060	136	6½	1108	137	7	1157	138	7½	1206	139	7½	1318	144	8	1366	145
20	6½	1195	133	7	1253	134	7½	1312	135	7½	1440	141	8	1497	142	8½	1555	143
24	6½	1620	142	7	1690	144	7½	1790	147	7½	1950	153	8	2050	155	8½	2150	158

ET—economic thickness HL—heat loss . . . Btu/hr/lineal foot ST—surface temperature

OWENS-CORNING FIBERGLAS CORPORATION

Industrial and Commercial Construction Materials Division, 717 Fifth Avenue, New York, New York 10022
General Offices, Toledo, Ohio 43601 • Pacific Coast Division, Santa Clara, California 95052

Pub. No. -IN-341-

Litho in U.S.A. 1/66

physical properties

density.....approximately 11 lbs. per cu. ft.
flexural strength (ASTM C-203) over 50 lb. per sq. in.

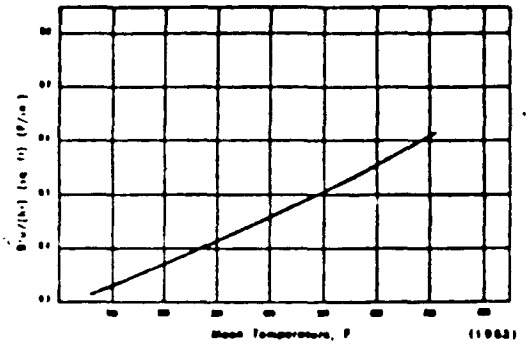
resistance to abrasion
(conventional tumbling test-loss in weight after 10 min.)
before heating.....9%
after heating for 24 hours
at 750 F.....5%
at 1000 F.....4%
at 1200 F.....3%

alkalinity .....ph 10

dimensional stability
linear shrinkage after heating for 24 hours in muffle
at 750 F 0.8%
at 1000 F.....0.9%
at 1200 F.....1.4%

specific heat .....0.22 Btu/lb.F.

thermal conductivity



specification compliance

HH-I-00523b Insulation Block, Pipe Covering and Cement, Thermal, Calcium silicate (For temperatures up to 1200F) Type II (Pipe covering) Classes A thru E.

MIL-I-2781D Insulation Pipe Covering, Thermal, Grade 1, Class B; Grade 2, Class D; Grade 3, Class E, Type 1 and 2.

economic thickness—ambient air at 80F

Pipe Temp. / Temp. Diff. / IPS	200 / 120 ET	HL	ST	400 / 320 ET	HL	ST	600 / 520 ET	HL	ST
¼	1	17	95	1½	40	106	2	63	113
⅜	1	19	97	1½	47	110	2	71	117
½	1	20	95	1½	50	109	2½	70	107
¾	1	25	99	2	52	104	2½	81	111
1	1	27	98	2	55	104	2½	84	112
1¼	1	27	98	2	61	104	2½	96	112
1½	1½	29	99	2	64	103	3	94	105
2	½	33	93	2	79	104	3	111	110
2½	½	33	91	2½	72	99	3	115	108
3	1½	40	94	2½	83	102	3½	118	106
3½	1½	36	93	2½	82	102	3½	120	107
4	1½	43	95	2½	94	105	3½	137	110
5	2	46	91	3	98	100	4	140	104
6	2	47	92	3	104	103	4	155	107
8	2	55	91	3	115	100	4	169	103
9	2	56	92	3	123	102	4	182	110
10	2	65	91	3½	124	98	4	200	107
11	2	73	92	3½	133	98	4	205	107
12	2	81	92	3½	142	98	4½	210	105
14	2½	72	90	3½	157	99	5	213	103
16	3	70	88	4	159	97	6	207	99
18	3	78	88	5	147	92	6½	212	97
20	3	85	88	5	151	93	6½	229	100
24	3	100	89	5	176	93	6½	266	99

economic thickness

Table key
ET—economic thickness (inches)
HL—heat loss (Btu/eft. hr)
ST—surface temperature (F)

Importance of specifying economic thickness
Selection of insulation thicknesses for any specific application should take into consideration at least the following criteria. 1. Type of insulation applied. 2. Cost of heat energy. 3. Cost of capital. 4. Cost of depreciation - plant and insulation. 5. Capital investment in heat production equipment. 6. Temperature difference. 7. Size of the pipe or surface. 8. Conductivity of insulation.

For this reason, the tabulated thicknesses are optimum thicknesses calculated on an "Economic" basis for heat conservation under average operating conditions and assure adequate protection for personnel. Special conditions may warrant the use of greater thicknesses.

Source: How to Determine Economic Thickness of Insulation"—Industrial Insulation Manufacturers Association.
Economic thickness—Heated Piping to 1200F (80F ambient

sizes

thicknesses—Kaylo Pipe Insulation is available in single layer thicknesses from 1" to 3" depending upon pipe size. Kaylo Curved Tubing Insulation is available in single layer thicknesses of 1" and 1½".

pipe sizes—Kaylo Pipe Insulation is available to fit nominal pipe sizes from ½" to 39" in diameter, and nominal copper tubing sizes from ⅜" to 3" in diameter. It is manufactured to Dimensional Standards Sizes to permit nesting in multiple-layer applications.

forms—Kaylo Pipe Insulation is available in sectional or multisegmental form depending upon pipe size. All insulation is furnished in 3 ft. sections.

jackets

Jackets are factory-applied on Sectional Pipe and Tube Insulation. On Multisegmental forms they are furnished but not adhered.

canvas—Kaylo Sectional Pipe Insulation includes standard canvas jackets, at no additional charge, on thicknesses up to and including 3" depending on pipe size.
6 oz. and 8 oz. canvas jackets are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge.

smooth and embossed aluminum—Kaylo is also available with smooth or embossed aluminum jacket .016" thick; or stainless steel .010". These weatherproof jackets provide greater resistance to mechanical damage and present a neat finished appearance to outdoor pipe lines. The longitudinal seam has a self-locking joint. Butt sealing strips are furnished with an integral weatherproof mastic for sealing end joints. For additional information refer to Data Sheet on Kaylo Klad Pipe Insulation.

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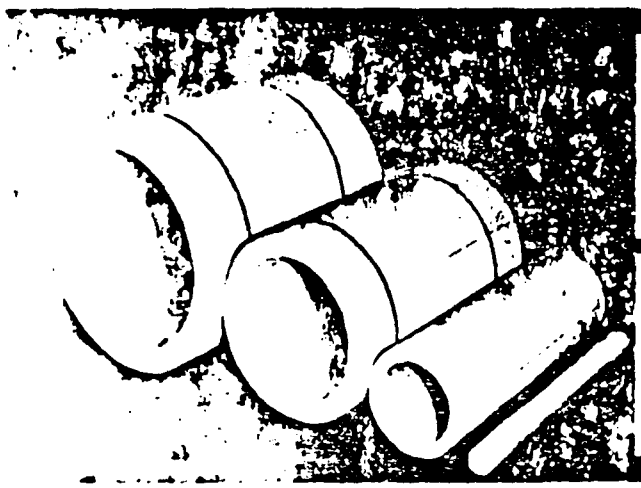
Pipe Insulation



Kaylo Pipe Insulation

for hot water heating, high temperature hot water, steam condensate piping systems and all heated lines to 1200F

uses

Kaylo is particularly suitable for use on high temperature piping systems where high performance and extended temperature range are required. Kaylo is widely used on hot piping where a great degree of physical abuse resistance is required, such as boiler and equipments rooms.

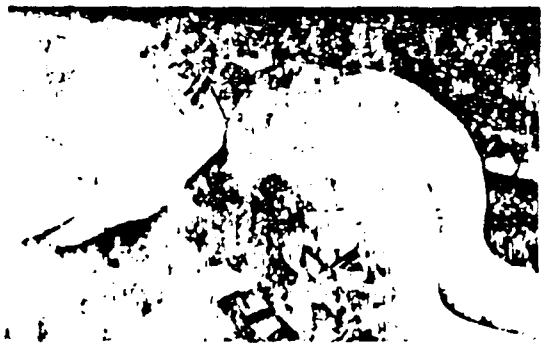
description

Kaylo Pipe Insulation is a rigid white hydrous calcium silicate insulation molded in sections for all types of indoor and outdoor piping that requires an abuse resistant, durable, efficient insulation, for temperatures up to 1200F.

benefits

rugged--Kaylo Pipe Insulation is a strong and rigid material that resists mechanical damage during shipping, installation and service. It is well suited for riser piping in exposed locations.

versatile- Kaylo's extended temperature range offers broader use for all hot piping to 1200F.

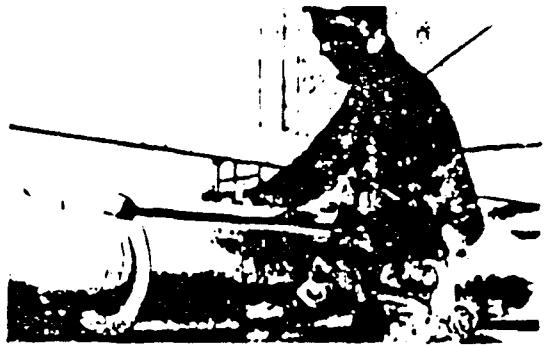


Kaylo Pipe Insulation cuts cleanly with straight square edges. The final result is well insulated piping with a neat finished appearance. Mitered fittings are finished with insulating cement and covered with canvas.

*T.M. REG. OCF CORP.

will not cause stress corrosion cracking—Kaylo will not cause stress corrosion cracking of stainless steel because Kaylo contains an inhibitor and has less than 200 ppm soluable chlorides.

unaffected by molsture—Kaylo can be completely saturated in water without appreciable loss of strength and regains its strength and thermal value after drying out.

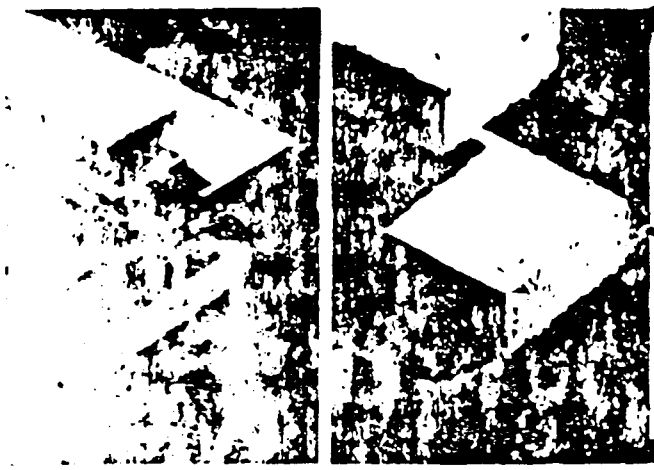


Kaylo Klad Pipe Insulation combines weatherproofing and insulation in one application. Attractive, maintenance-free factory-applied jackets of stainless steel and aluminum are complete with longitudinal locking seams and end joint butt strips.

plumbing systems 1.6
mechanical equipment 8.6
power & process equipment 6.6
vessels & tanks 7.7
boilers & chimneys 8.3
January, 1961

OWENS-CORNING FIBERGLAS

Equipment Insulation



Kaylo & Kaylo 20 Block Insulation

rigid calcium silicate insulations for all types of heated equipment operating at temperatures up to 1800F.

uses

Kaylo* Block is for use on indoor or outdoor equipment operating at temperatures up to 1200F. Kaylo Block is also very well suited for use on stainless steel vessels and equipment as it inhibits stress corrosion cracking. Typical applications are for boilers, breeching, tanks, vessels.

Kaylo 20* with its high temperature limit of 1800F extends its use to include refractory wall backing for furnaces and boilers and fireproofing of equipment and vessel skirts.

description

Kaylo and Kaylo 20 Block Insulations are rigid hydrous calcium silicate heat insulations reinforced with asbestos fibers. They are strong, efficient and are highly resistant to abrasion and moisture damage. Kaylo 20 has a slightly pink color to distinguish it from Kaylo.

benefits

high thermal efficiency—both Kaylo and Kaylo 20 offer excellent thermal efficiency coupled with high strength. A low k of .37 for Kaylo and .43 for Kaylo 20 at 200F mean temperature proves that Kaylo will provide significant savings in operating costs over the life of the equipment.

resistant to abuse—resists mechanical damage because of hard, tough, reinforced structure.

strong—less breakage in shipment and handling. High temperatures have little effect on strength characteristics.

will not cause stress corrosion cracking—Kaylo will not cause stress corrosion cracking of stainless steel because Kaylo contains less than 200 ppm soluble chlorides as well as an inhibitor which prevents trace quantities of chlorides from the atmosphere or other sources from causing cracking and possible failure of piping and equipment.

resistant to moisture damage—unlike many other insulations, Kaylo is not affected appreciably from moisture damage. It regains thermal efficiency and strength after drying out. Outdoor installations must be weatherproofed, however, for long continuous service.

dimensionally stable—Kaylo does not shrink appreciably in service, even at elevated temperatures. This means less heat leakage at the joints. And Kaylo will not warp or crack in service.

fabricates easily—ordinary insulators tools are all that is required to fabricate Kaylo. It cuts with a clean true edge for tighter fit at the joints. Fittings are neater, faster.

*T.M. REG. OCF CORP.

physical properties

	Standard Kaylo	Kaylo 20
density:	11 psf approx.	12 psf approx.
flexural strength:	over 50 lb/sq. in. (ASTM C-203)	90 lb/sq. in.

compressive strength: (at 5% deformation) (ASTM C-165) Kaylo 20: before heating, 130 lbs. per square inch.

Standard Kaylo: before heating, 150 lb/sq. in.; 144 lb/sq. in. at 750°F. 123 lb/sq. in. at 1000°F; 117 lb/sq. in. at 1200°F; after boiling for 24 hr., 74 lb/sq. in. (while wet).

resistance to abrasion: (conventional tumbling test—loss in weight after 10 min.)

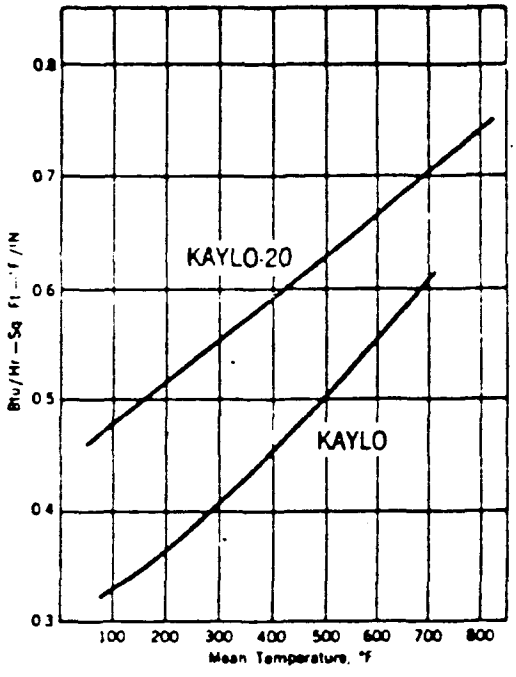
	standard Kaylo	Kaylo 20
before heating	9%	3%
after heating for 24 hr.		
750°F	5%	
1000°F	4%	
1200°F	3%	5%
1800°F		20%

alkalinity: ph 10

dimensional stability: linear shrinkage after heating for 24 hours in muffle

standard Kaylo		Kaylo 20
750°F	0.8%	
1000°F	0.9%	
1200°F	1.4%	0.7%
1800°		1.6%

thermal conductivity



key

ET—recommended thickness (inches)
HL—heat loss . . . Btu/hr/lineal foot
ST—surface temperature

economic thicknesses

Selection of insulation thicknesses for any specific application should take into consideration the following important criteria. 1. Cost of insulation applied. 2. Cost of heat energy. 3. Cost of capital. 4. Cost of depreciation—plant and insulation. 5. Capital investment in heat production equipment. 6. Temperature differential. 7. Size of the pipe or surface. 8. Conductivity of insulation.

for hot piping, the tabulated thicknesses are optimum thicknesses calculated on an "Economic" * basis for heat conservation under average operating conditions and assure adequate temperature control. Other conditions may warrant the use of other thicknesses.

**From "How to Determine Economic Thickness of Insulation"—National Insulation Manufacturers Association.*

Kaylo Block to 1200F—ambient temperature 80F

Operating Temp. F	Commercial ET	Commercial HL	Commercial ST	Power ET	Power HL	Power ST	Process ET	Process HL	Process ST
[illegible]	1	36	103	1	36	103	1	36	103
[illegible]	1½	50	110	1	69	119	1	69	119
400	2½	48	108	1½	74	122	1	106	138
500	3½	47	108	2	82	126	1½	104	136
600	4½	48	108	2½	85	128	1½	133	148
700				3	89	129	2	127	145
800				4	80	124	2½	125	144
900				4½	86	127	3	124	144
1000				5½	80	125	3½	125	144
1100				6	84	126	4	125	143
1200				6½	90	127	4½	127	143

Kaylo 20 Block to 1800F—ambient temperature 80F

Operating Temp. F	Power ET	Power HL	Power ST	Process ET	Process HL	Process ST
1300	7½	111	136	6	135	148
1400	8	117	139	6½	143	152
1500	8	123	142	7	151	155
1600	8½	129	145	7	158	159
1700	9	135	148	7½	165	163
1800	9½	141	151	7½	172	166

sizes

Thickness—1", 1½", 2", 2½", 3", 3½" and 4"
Width—3", 6", 12" and 18"
Length—8" to 36"
Shape—Block

beveled lags

For pipe sizes greater than those for which Kaylo and Kaylo 20 insulation block sizes are available, Kaylo and Kaylo 20 beveled lags may be used to insulate piping. Lags beveled to fit pipes from 18" to 36" in diameter are available in thickness 1", 2", 2½", 3". Lags are 36" long and 3" wide.

federal specifications

HH-I-523b Insulation Block, Pipe Covering, and Cement, Thermal, Calcium Silicate, Type I.

MIL-I-2819D Insulation Block, Thermal. Class 1, 2, & 3. ASTM C533-64T: Kaylo—Class 1 & 2; Kaylo 20—Class 1, 2, 3.

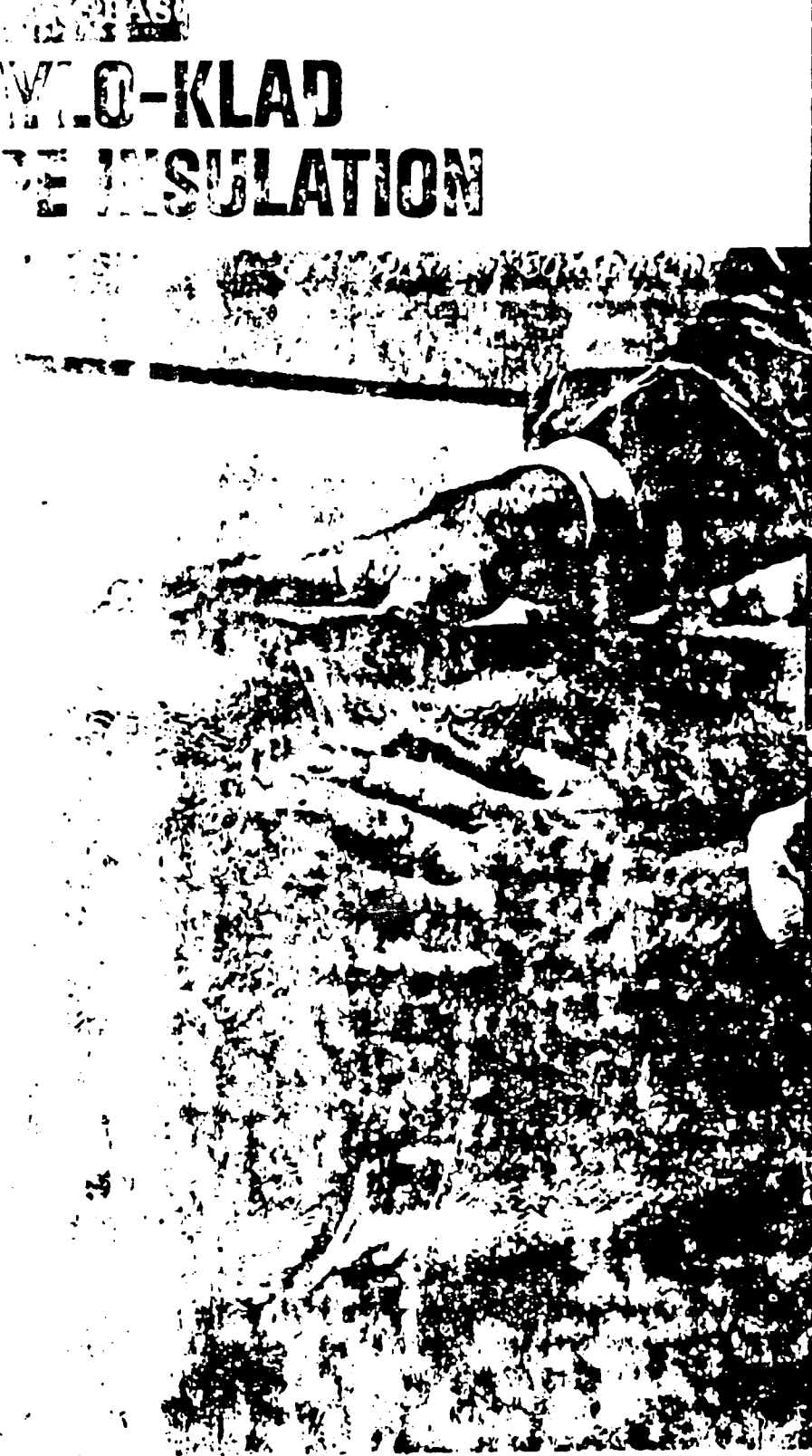
application recommendations

Kaylo and Kaylo 20 Block Insulations are held in place by mechanically fastening with bands, welded rods or studs. The insulation may be finished with a trowel coat of insulating cement, canvassed and painted. Outdoor installations require weatherproofing with mastics or metal jacketing.

[illegible] CORPORATION

all-weather protection, effective insulation and attractive no-glare appearance for piping

KAYLO-KLAD PIPE INSULATION



DRESSED-UP APPEARANCE — S
nippled texture embossed in the
minum jacket diffuses light and
inates glare plus giving piping a m
attractive, distinctive appearance.

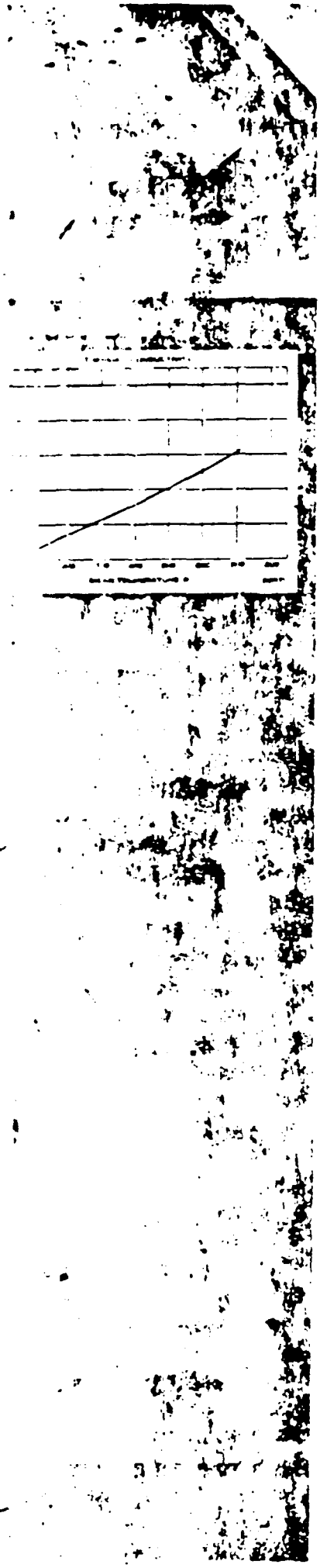
DAMAGE RESISTANCE — Thick (.0
aluminum jacket supported by str
rigid Fiberglas Kaylo insulation
vide superior resistance to mech
cal damage of all kinds. Assu
maintenance of performance and
pearance in the most rugged ser
over long periods of time.

TIME SAVING — Jacket and insulat
install in one step. Longitudinal
locking seam holds insulation fir
in place until banded. Easy-on ba
seal end joints. Fabricates quic
with simple tools: a band or hack
for straight cuts, a portable sabe
for cut outs. In standard sectio
pipe covering sizes in single la
thicknesses up to 3".

WEATHER RESISTANCE — Waterti
aluminum jacket has interlocking
at longitudinal seam which mesh
gether so that, faced downward, t
insure weather tightness. End je
bands have integral sealing compou
to hold them in place and seal t
weather.

EFFICIENT INSULATION — Kaylo
reinforced hydrous calcium silic
consists majorly of entrapped air ce
which make this material superior
insulating effectiveness to other
sulations in its temperature range
up to 1200 F.

RE-USABLE — Jacket unsnaps to p
mit removal of insulation witho
damage for inspection or re-use.



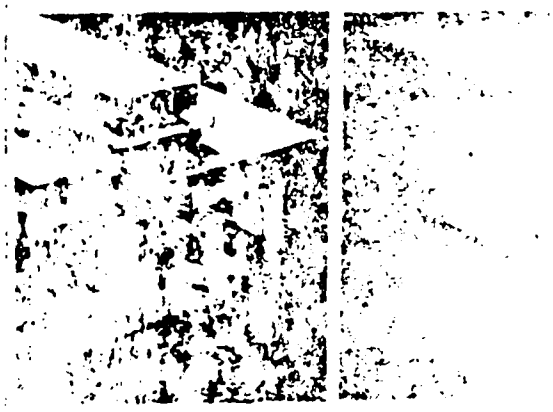
FIBERGLAS

KAYLO-KLAD PIPE INSULATION

one-step application gives piping weather protection and insulation

White, rigid hydrous calcium silicate Kaylo insulation is fitted with a thick, ripple-textured embossed aluminum jacket to provide a unique combination of performance and appearance benefits. Applied on piping (up to 1200 F) by simply opening, placing on pipe, and pushing lower single jacket edge securely into opening of folded seam. Provides long service life and cleaner appearance for any power, chemical, refining or industrial piping installation. Also available with .010" smooth stainless steel jacket with curved, self-locking longitudinal seam joints for use where special corrosive fumes are present or fire protection is a major consideration.

Kay[illegible]



K[illegible] Kaylo 20 Block [illegible] [illegible]ate heat insulatio[illegible] [illegible] They are manufactu[illegible] [illegible] Corporation. Kaylo is [illegible] [illegible] heated equipment [illegible] [illegible] Kaylo 20 has a slight [illegible] [illegible] regular Kaylo.

Both of these widely used heat [illegible] [illegible] efficiency, high strength [illegible] [illegible] damage. They [illegible] [illegible] characteristics of heat [illegible] [illegible] lected over most [illegible]

[illegible] factors place Kaylo [illegible] [illegible] insulation [illegible] [illegible] Kaylo covers a [illegible] [illegible] The [illegible] the [illegible] [illegible] for temperatures [illegible] [illegible] may be used as a single layer [illegible] [illegible] to 700°F. and in double [illegible] [illegible] 1800°F, or, may be [illegible] [illegible] Kaylo or Fiberglas [illegible]

Insulations exhibit [illegible] [illegible] and resistance to abra[illegible] [illegible] requirements for heat [illegible] [illegible] [illegible] in shipping [illegible] [illegible] may no effect [illegible] [illegible] [illegible] temperature [illegible] [illegible] wall backing for [illegible] [illegible] equipment and [illegible]

[illegible]

[illegible] -1", 1½", 2", 2½", [illegible]

[illegible] 6", 12" and 18"

[illegible] to 36"

[illegible] (curved block av[illegible]

[illegible]

[illegible] block insulation should [illegible] [illegible] temperature range [illegible] [illegible] 1800°F. Outdoor [illegible] [illegible] finish. If used [illegible] [illegible] are required.

*T. M. Owens-Corning [illegible]

[illegible]commended thicknesses

[illegible]

—recommended thickness E—[illegible]

—[illegible] loss ST—surface [illegible]

KAYLO

ambient temperature 80 F

Equip. Temp. F	(110 F max St.) COMMERCIAL				80 (130 F [illegible]) POWER			
	RT	HL	E	ST	RT	HL	E	ST
200	1	36	86.8	103	1	36	[illegible]	
300	1½	50	92.0	110	1	[illegible]	[illegible]	
400	2½	48	91.7	108	1½	[illegible]		
500	3½	47	97.3	[illegible]	2			
600	4½	48	98.2	[illegible]	[illegible]	[illegible]		
700					3	[illegible]		
800					4	[illegible]	[illegible]	
900					4½	[illegible]		
1000	not applicable				[illegible]			
1100					6	[illegible]	[illegible]	
1200					6½	[illegible]	[illegible]	

KAYLO 20

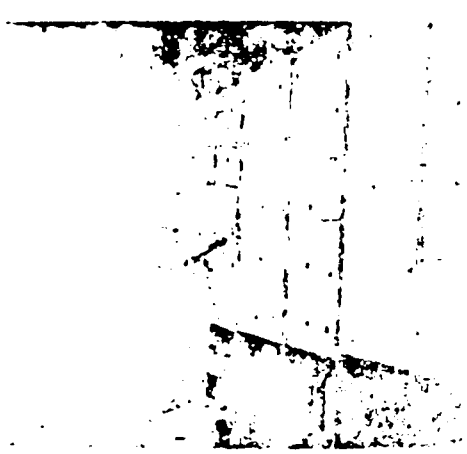
temp. diff.: hot surface to [illegible]

temp. diff.	1100	1200	1300	1400	[illegible]
thickness	5	5½	6	6	

For temperatures to 1200 F, use standard [illegible] thickness. Design surface temperatures are approximately [illegible]

For true economic thickness, request a DIVIDEND [illegible] from your local Fiberglas branch office.

application details



Kaylo insulation installation. Application of 2 layers [illegible] and secured with metal [illegible]

OWENS-C[illegible]

Industrial [illegible]

General Offices [illegible]

Long-lasting,
gh performance insul
r heated equipment
to 1800 F.

[redacted]

NYLO BLD



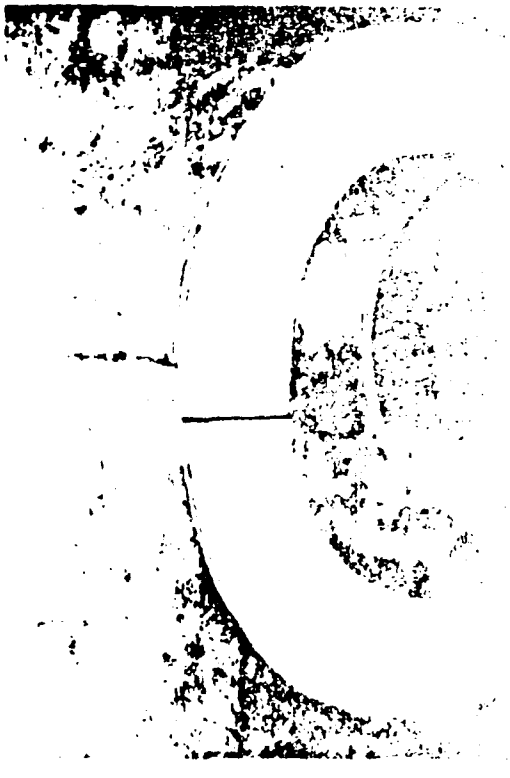
RGLAS

You can now reduce your ... temperatures up to 1800 F ... specifying Kaylo* Trace Insul...

Kaylo Trace Pipe Insulation ... less steel jacket.

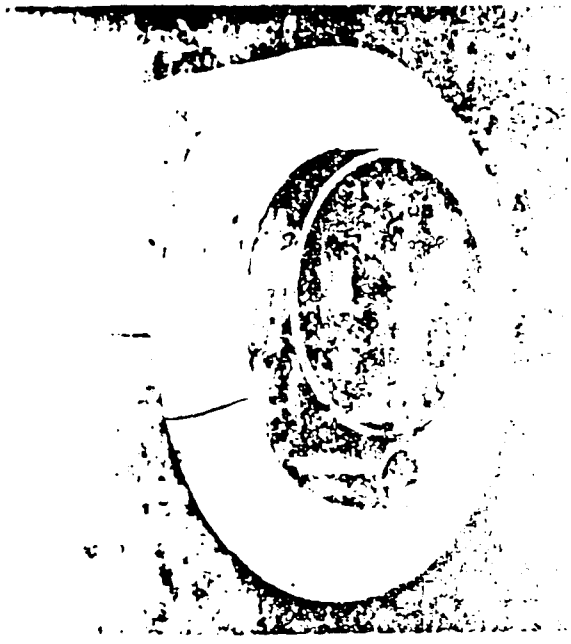
The embossed aluminum ... for exterior applications. The ... holds the sectional pieces toge... allows the "one step" method ... applied together. The lon... the weather while the bu... at each end joint.

The canvas jacketing will accept ... separately covered with roofin... cation.



The Fiberglas product described ... tion without notice. Properties and ...

*Trademark of Owens-Corning Fiberglas ...



Kaylo Klad Trace Pipe Ins[illegible]
Stainless Steel) is avail[illegible]
stainless steel jacket [illegible]
jacket presents a near fin[illegible]
to pipe lines and is recomme[illegible]
atmospheres having a high alka[illegible]
Consult OCF for specialized a[illegible]

SIZES

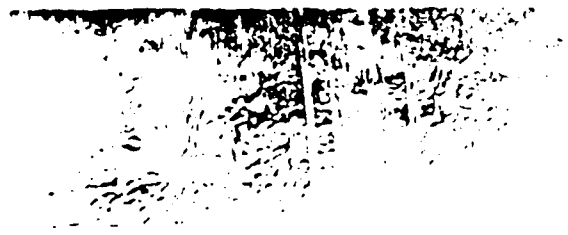
Thicknesses: - Kay[illegible]
[illegible]

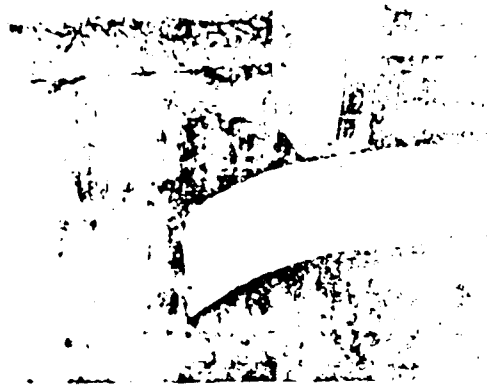
Pipe Sizes: - Kaylo [illegible]
pipe siz[illegible]

Trace Line Sizes: - Kay[illegible]
sta[illegible]
trace [illegible]
[illegible]
sub[illegible]
in a[illegible]
spe[illegible]

LIMITATIONS

Kaylo Trace and Kaylo Klad Trace
not exceeding 1200 F. For the [illegible]
Trace and Kaylo-20 Klad Trace [illegible]





PHYSICAL PROPERTIES

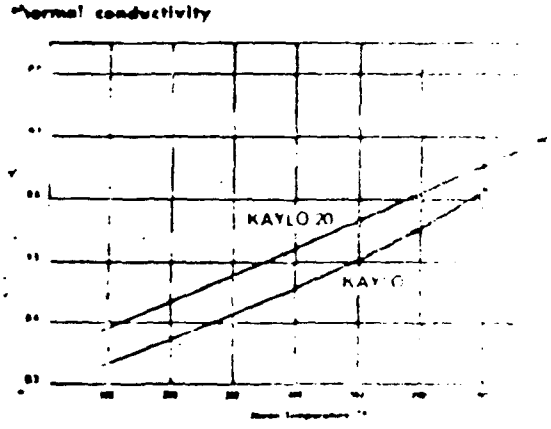
Density

Flexural Strength
(ASTM C-203)

Compressive Strength
(at 5% deformation)
Before Heating

Dimensional Stability
(linear shrinkage after
heating for 24 hrs. in
muffle)

THERMAL CONDUCTIVITY



APPLICATION SPECIFICATION

for Insulation of piping with Kaylo Trace

Applicable Specifications

HH-I-523c — Insulation Block, Pipe Cover, temperatures up to

MIL-I-2781C — Insulation pipe covering, Grade III, Class

1. Insulating Materials

All heated pipes up to 1200 F with Trace Pipe Insulation. All hea with Kaylo-20 Trace Pipe Insula ness for 1200 F and 1800 F Trace as shown in recommended thickn

2. Application

All Kaylo Trace Pipe Insulation sect adjoining sections firmly together layer shall be wired in place with with all joints staggered. All fla fabricated mitered segments of pi the adjoining pipe. Fittings an O-C 110 Insulating Cement at

When Kaylo Klad (aluminum or ation shall be applied in such a the insulation through the longit

3. Surface Finish

Indoor pipe not subject to abrasion the factory furnished canvas.

Piping located outdoors shall be either an embossed aluminum or

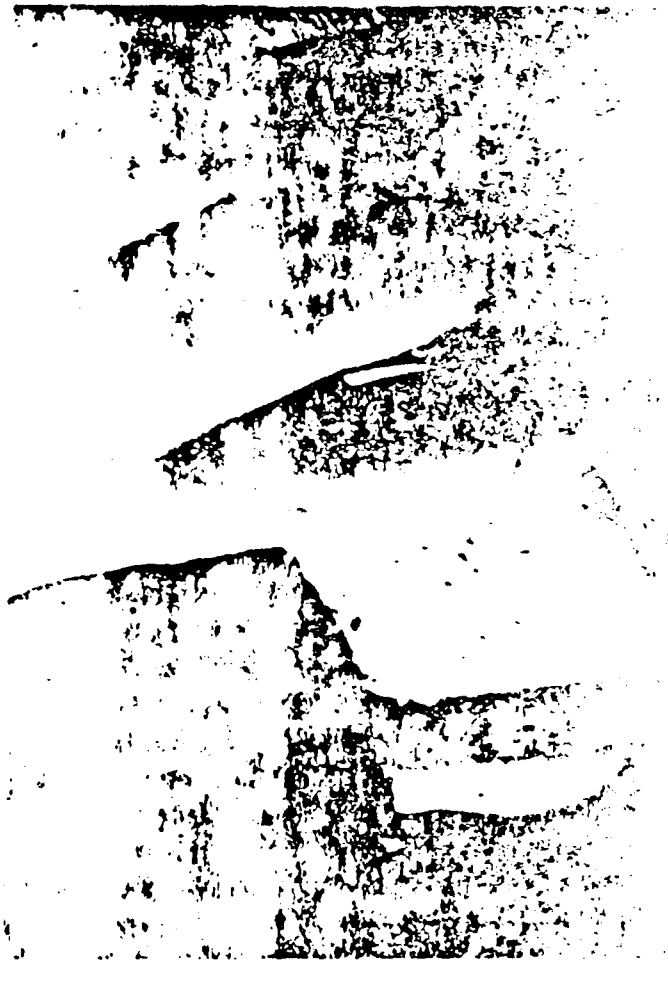
All circumferential end joints sha The butt strip shall be position located across the joints.

The aluminum butt strip shall be wide .020 aluminum bands, bund covered to the stainless steel jacket tightened. (NOTE: Care shall excessive compression of the jack

Insulation on flanges, valves and fit
Trace Pipe Insulation has been used,
Insulating Cement.

Insulation on flanges, valves and
Pipe Insulation has been used,
of either aluminum or stainless st
and secured with stainless steel

The foregoing is necessarily gene
approval is at the discretion and
Job requirements.



TRACE PIPE REFERENCE TABLE

The following tables may be used as a guide to [illegible] pressure, and insulation thickness required to [illegible] ature.

EXAMPLE:

Assumed Conditions

2 IPS water or process line
Temperature minimum - 100 F
Ambient temperature - 0 F
Wind velocity - o ft./sec.
15 psi steam pressure

The 15 PSI Table below shows you can [illegible] pressure and 1" thick insulation or [illegible] insulation. Steam traps should be [illegible] temperature.

Tables should be used only as a guide.

STEAM TRACING [illegible]

[illegible]		STEAM PR[illegible]			
	Process Line Size, IPS	3/8	1/2	3/4	
	Actual OD	0.675	0.840	1.050	[illegible]
[illegible]	Temp. °F	112	103	112	[illegible]
	Length Ft.	72	70	19	[illegible]
[illegible]	Temp. °F	133	133	142	
	Length Ft.	207	207	222	[illegible]
3/8	Temp. °F	123	115	125	123
	Length Ft.	76	75	81	[illegible]
[illegible]	Temp. °F	147	147	154	14[illegible]
	Length Ft.	224	224	236	224
2/8	Temp. °F	131	123	132	[illegible]
	Length Ft.	83	78	83	[illegible]
5/8	Temp. °F	155	155	16[illegible]	[illegible]
	Length Ft.	235	235	25[illegible]	[illegible]

NOTE: Max. length between steam traps [illegible]

Kaylo Klad Trace Pipe Insulation accomm[illegible] supported by "W" clips.

Insulation Thickness	Tracer Size OD	Process Line Size, IPS	3/8	
		Actual OD	0.675	
1	3/8	Temp. °F	132	
		Length Ft.	175	
	5/8	Temp. °F	160	
		Length Ft.	350	
1-1/2	3/8	Temp °F	146	
		Length Ft		
		Temp °F		
		Length Ft	385	
2	3/8	Temp °F	158	
		Length Ft	140	
	5/8	Temp. °F	182	
		Length Ft	400	

NOTE: Max. length between

Available from authorized distributors listed in the yellow pages of your classified directory or from the Owens-Corning Branch Office listed below

Albuquerque, New Mexico
Anchorage, Alaska
Atlanta, Georgia
Baltimore, Maryland
Birmingham, Alabama
Boise, Idaho
Boston, Massachusetts
Buffalo, New York
Charleston, West Virginia
Charlotte, North Carolina
Chicago, Illinois
Cincinnati, Ohio
Cleveland, Ohio
Columbus, Ohio
Dallas, Texas
Dayton, Ohio
Denver, Colorado
Des Moines, Iowa
Detroit, Michigan
Evansville, Indiana
Fort Wayne, Indiana
Fresno, California
Grand Rapids, Michigan
Greenville, South Carolina
Hartford, Connecticut
Honolulu, Hawaii
Houston, Texas
Indianapolis, Indiana
Jacksonville, Florida
Kansas City, Missouri
Los Angeles, California
Louisville, Kentucky
Memphis, Tennessee
Miami, Florida
Milwaukee, Wisconsin
Minneapolis, Minnesota
Mobile, Alabama
Nashville, Tennessee

OWENS-CORNING

Industrial and Commercial Construction

General Offices,

PUB. NO. 1-IN-2023



heavy density

...hot and cold lines from minus 120 ...



DESCRIPTION

Fiberglas Sectional Pipe Insulation is a precisely molded pipe covering composed of Fiberglas wool bonded and formed in two half cylinders of a density of 7½ lbs./cu. ft. It is available in 3' long sections to fit all types of pipe and tube from ¾" IPS to 33" operating at temperatures from minus 120 F up to 450 F. A variety of jackets for appearance, vapor barrier, fire protection or waterproofing permit selection of the most any-purpose insulation for a specific end use indoor or out, cold or hot line applications. Thicknesses follow Simplified Dimensional Standards to permit nesting for double layer applications.

ADVANTAGES

This inorganic pipe insulation offers superior thermal efficiency.

It is priced competitively with other insulations yet delivers greater thermal performance for long term heat savings or where precise temperature control is required.

Fiberglas Sectional Pipe Insulation is easy to cut to fit. It is firm and resists compression. Only a sharp knife is required to fabricate. It will not settle or shrink, withstands thermal shock, will not corrode pipe or rot and is not permanently affected by moisture. Factory applied jackets resist penetration.

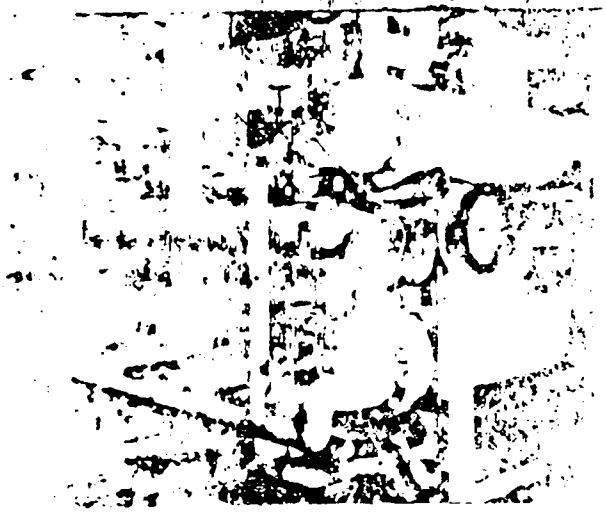
Close manufacturing tolerances assure uniform thickness and close fitting to the pipe. The sections mesh at the joints to give, in effect, a continuous unbroken covering of efficient insulation.

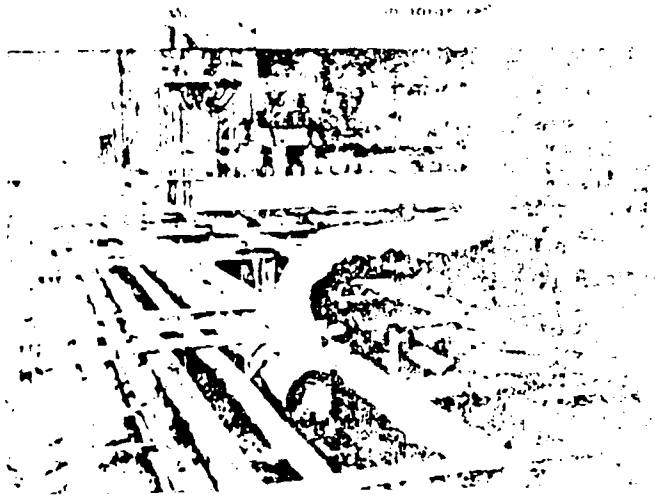
JACKETS & USES

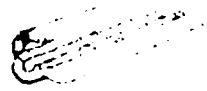
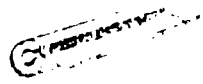
Fiberglas Sectional Pipe Insulation is available with a variety of jackets for appearance, puncture, vapor barrier, fire retardant and weather protection. The selection of a particular end use determines the jacket to use.

FRJ (Fire Retardant Jacket)—Minus 150 F to 200 F—Owens-Corning has attempted to reduce the number of jackets required and offers a new vapor barrier jacket that is fire retardant, and presents a finished appearance. It is composed of one ply of kraft paper and a layer of aluminum foil laminated together with a self-extinguishing adhesive and reinforced with Fiberglas yarn. The exterior surface is coated white eliminating the need for painting. This versatile factory-applied jacket material makes Fiberglas FRJ Sectional Pipe Insulation the ideal material for commercial and industrial low and dual-temperature piping operating up to 450 F.

FIBERGLA





requirements	service* temperature	product	[illegible]	[illegible]	page
[illegible]	up to 450 F	 canvas [illegible] jacketed pipe [illegible]		[illegible]	4
[illegible]	—120 F to 450 F	 vapor [illegible] fire retardant [illegible]	[illegible]	[illegible]	4
[illegible]	—30 F to 400 F	 multi-purpose one-piece pipe insulation	[illegible]	[illegible] sections [illegible]	10
[illegible]	up to 1200 F (standard Kaylo) / 1200 F to 1800 F (Kaylo 20)	 Kaylo, Kaylo 20 and Kaylo [illegible] pipe insulation	[illegible]	[illegible] pipe sizes— [illegible] tubing sizes—[illegible] to 3½" o.d. x 3 sections	12

* [illegible] are for the jacket and insulation for require

esign data for Kaylo Insulations

[illegible] presents reference data for information on the [illegible] thicknesses according to the simplified Dimensional [illegible] system.

[illegible] following data are presented to aid in the design of [illegible] Pipe Insulation modified to meet specific needs. [illegible] mendations are generalized and should be modified to [illegible] local conditions and job requirements.

mportance of calculating economic thickness

[illegible] of insulation thicknesses for any specific applica[illegible] should take into consideration at least the following [illegible]

1. Cost of insulation applied
2. Cost of heat energy
3. Cost of capital

pplications—Kaylo and Kaylo-Klad



Off-site yard steam insulated with Kaylo Pipe Insulation for efficiency and controlled temperatures at distant points.



New Kaylo Trace Line pipe Insulation and Kaylo Klad Trace Line Pipe Insulation (jacketed with .016 embossed aluminum or .010 stainless steel) provide great economy in the insulation of trace lines.

These pre-molded trace line insulations are designed for insulating piping 2" IPS x 1" thick up to 8" IPS x 2" thick together with a 1" trace line.

Advantages of this Kaylo molded insulation include higher strength, more rigid construction and, in the case of Kaylo Klad, single application of both insulation and weather proofing. Application and maintenance costs are both reduced. Where a trace line is greater than one inch, an extended leg insulation can be fabricated to special order, contact your local OCF Branch Office.

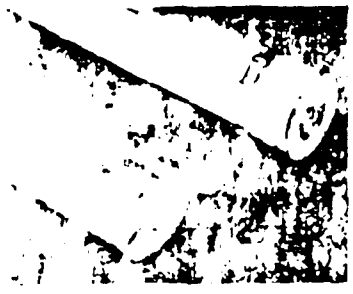
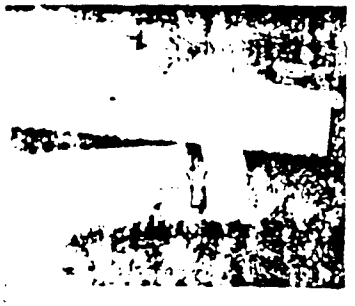






[illegible] the weather. [illegible] with [illegible] protection.

it's the low [illegible] that [illegible]

Multi-Purpose Use with Appropriate Jacket	use	jacket description	application details
Heated lines to 450 F 	This universally accepted efficient pipe insulation is recommended for heated lines operating at temperatures up to 450 F where a jacket is required for surface finish, or as a base for painting.	**Canvas** Available [illegible] sizes up to 12" [illegible] A or B [illegible] weight factory applied, complete with [illegible] longitudinal [illegible] seal strips. Aluminum bands [illegible] pitched [illegible] and [illegible]. Additional [illegible] required [illegible] joints and ends.	[illegible] applied to piping [illegible] sizes pasted smoothly [illegible]. Bands may be used [illegible] additional mechanical fastening or for appearance. Insulation for piping over 12" is wired in place and subsequent [illegible] with field applied [illegible] fittings are insulated with [illegible] glass molded fitting covers or OC 110 Insulating Cement. [illegible] application details and [illegible] weatherproofing are out[illegible] Page 8
Cold & Dual-Temperature or Fire Safety for Lines from Minus 120 F to 450 F 	This all purpose fire retardant vapor barrier jacket factory-applied to Fiberglas covers a broad range of pipe insulation requirements from sub zero process brine, refrigerant, chilled and ice water to dual temperature lines and also provides fire safety for all lines operating in temperature range from minus 120 F. to 450 F. Nesting sizes permit multiple layer application and broken joint construction. Asphalt laminated foil Kraft foil dual temperature jacket is still available for lines not exceeding 250 F.	**Fire Retardant Vapor Barrier Jacket** Fire retardant vapor barrier jacket is composed of one layer of Kraft paper and a layer of aluminum foil laminated together with [illegible] asphalt [illegible] [illegible] [illegible] with [illegible] Fiberglas yarn. The exterior surface is coated white to present a neat appearance and reflect [illegible] further surface [illegible] or [illegible] lines. Vapor barrier [illegible] [illegible] [illegible]

...mmended thickness Fiberglas heavy density sectional pipe insulation

...d piping to 450 F

ambient 80 F

For Commercial & Industrial Applications 110 F surface temp.											For Power & Utility Uses 150 F surface temp.									
...ness.	to 25 psig			to 100 psig.			to 235 psig.				to 25 psig.				to 100 psig.					
...mp	to 247 F			to 338 F			to 400 F				to 247 F				to 338 F					
...e	187 F			238 F			330 F				187 F				238 F					
...	BT*	ML	E	ST	BT*	ML	E	ST	BT*	ML	E	ST	BT*	ML	E	ST	BT*	ML	E	ST	BT*
	...	24	80.5	103	1"	30	84.7	104	1½"	...	88.2	1..	...	...	...	...	...	35	81.2	113	...
	...	28	81.1	105	1"	37	84.8	111	1½"	38	88	...	...	...	...	...	...	42	82.5	114	...
	...	32	82.2	106	1"	38	86.8	107	1½"	42	89	...	...	...	...	...	...	...	83.5	115	...
	...	38	83.6	107	1"	48	86.9	112	1½"	44	...	...	...	...	...	...	...	...	84.2	1.9	1"
	...	40	40	108	1"	49	88.3	107	1½"	50	9...	...	...	...	...	...	...	44	83.0	112	...
	...	48	41.8	109	1"	57	89.8	111	1½"	58	92	...	...	...	...	...	...	49	83.5	120	...
	...	57	42.1	107	1"	67	89.0	111	1½"	76	...	...	...	...	...	...	...	51	84.1	12	1"
	...	67	43.3	109	1"	80	89.2	111	1½"	79	...	...	...	...	...	...	...	52	84.5	122	1"
	...	75	87.2	111	1"	96	89.8	112	1½"	91	91.3	...	...	...	...	...	...	56	86.8	123	...
1"	8	88.8	104	1½"	87	92.5	104	2"	1...	94.0	...	...	...	...	...	...	...	45	87.0	124	1"
1"	9...	89	105	1½"	101	92.8	105	2"	1...	94.2	...	...	...	...	...	...	...	...	86.9	115	1"
"	10	91	105	1½"	110	92.8	134	2"	1...	94.4	...	...	...	...	...	...	...	...	89.9	16	1"
	...	8...	89.5	105	1½"	...	92.9	105	2"	...	94.5	...	...	...	...	...	...	...	90.6	...	...
	...	9...	89.5	105	1½"	136	93.0	105	2"	1...	94.5	...	...	...	...	...	...	...	90.5	...	...
	...	9...	90.2	106	1½"	143	93.2	106	2"	...	94.6	...	...	...	...	...	...	...	...	...	...
	...	14...	90.8	111	1½"	150	93.5	105	2"	...	94.8	10...	...	...	...	...	...	...	90.5	...	1"
	...	...	90.9	104	1½"	161	93.4	104	2"	...	94.7	...	...	...	...	...	...	...	...	...	...
1½"	38	91.7	100	2"	148	93.9	99	2½"	...	...	...	3...	...	...	...	...	...	...	89.8	...	1½"
1½"	...	92.2	98	2"	170	94.1	...	2½"	11	...	...	...	...	...	...	...	...	...	...	...	1½"
1½"	16...	92.3	98	2"	190	94.3	...	2½"	...	...	...	...	...	...	...	10...	...	...	...	...	1½"
	...	18	92.4	98	2"	207	94.4	103	2½"	...	...	...	...	...	...	...	...	...	91.8	10...	1½"
	...	2...	92.5	98	2"	240	94.5	101	2½"	...	...	...	...	...	...	...	...	...	864	...	1½"
	...	2...	92.5	99	2"	310	94.5	101	2½"	...	...	...	...	...	...	...	...	...	89	...	1½"
	...	28...	92.5	99	2"	329	94.5	101	2½"	344	...	...	...	...	...	99	...	...	440	...	1½"

...d dual—Temperature piping—minus 120 F. to 20... F.

ambient 90 F

	90% relative humidity												8... relative humidity								
...face tur...	40 F		35 F		0 F		-30 F		-60 F		-120 F		... F		0 F		-30 F		-60 F	
...on	chilled water		ice water		brine		special brine		refrig-erants		cascade products		water		brine		special brine		refrig-erants	
...ns	BT*	MG	BT*	MG	BT	MG	BT	MG	BT	MG	BT	MG	BT	MG	BT	MG	BT	MG	BT	MG	BT	MG
	...	3.8	1...	5	2½	6	3	7	3½	...	...	...	...	...	...	...	...	...	8	...	6	...
	...	4.1	1...	5	2½	6	3	7	3½	8	4½	...	...	...	...	...	...	...	8	...	6	...
	1½	4.7	1½	6	2½	6	3	8	3½	9	4...	...	...	...	...	...	...	...	...	...	9	10
	1½	5.3	2	6	2½	7	3	9	3½	11	4...	12	...	...	...	...	...	...	...	...	10	12
	1½	6.0	2	7	3	8	3½	8	3½	10	5	...	...	...	...	...	...	9	2½	11	3	12
	1½	5.8	2	7	3	8	3½	10	4	11	5	...	...	...	...	...	...	...	2½	11	3	14
	...	7.2	2	8	3	10	3½	11	4	12	...	...	...	...	...	...	...	12	2½	14	3	15
	...	7.5	2	9	3	10	4	11	4½	13	...	...	...	...	...	...	...	13	2½	15	3	16
	...	9.1	2	10	3	12	4	13	4½	15	6	6	...	...	2	...	...	...	2½	17	3	19
	...	10.6	2½	11	3½	13	4	15	4½	17	6	10	...	...	2½	...	6	...	2½	20	3½	20
	...	9.4	2½	12	3½	14	4½	16	5	18	6½	21	...	...	...	...	8	...	3	21	3½	22
	...	11.8	2½	4	3½	15	4½	17	5	19	4½	22	...	...	2½	20	8	20	3	22	3½	24
	...	13	2½	15	3½	17	4½	18	5	21	4½	24	...	...	...	...	...	...	3½	24	3½	27
	...	14	3	16	4	17	4½	20	5½	23	5	25	...	...	2½	23	...	...	3	27	3½	30
	...	17	2½	17	4	18	4½	22	5½	24	7	27	5	26	2½	25	8	...	3	29	3½	32
	½	18	2½	19	4	20	4½	23	5½	25	7	28	5	29	4½	28	8	...	3	31	3½	34
	...	20	2½	21	4	21	5	24	5½	26	7	30	5	33	4½	30	...	...	3	34	3½	36
	...	21	2½	23	4	23	5	28	6	27	7½	31	5	28	2½	33	...	...	3	38	4	37
	...	...	½	25	4	25	5	28	6	27	8	32	...	32	2½	37	...	...	3	41	4	40
	24	...	½	27	4	29	5	31	6	32	8	32	...	33	2½	41	...	...	3	46	4	45
	...	26	2½	31	4	31	5	33	6	35	8	36	...	38	2½	47	...	45	3½	45	4	49
	...	30	3	2	4½	33	5½	37	6	41	8	44	...	44	2½	54	...	54	3½	50	4	58
	...	...	3	32	4½	40	5½	43	6½	48	8	50	...	50	2½	64	...	64	3½	64	4	68
	4	...	3	45	4½	47	5½	51	6½	54	8	60	...	60	2½	77	...	73	3½	73	4	79
	...	3.5	½	3.8																		
	...	3.9	½	3.5																		
	...	3.5	1½	3.8																		
	...	3.9	1½	4.2																		
	...	4.2	1½	5.0																		
	...	4.9	½	5.4																		
	...	5.6	1½	6.1																		
	...	6.0	2	5.8																		
	...	...	2	6.8																		
	...	7.4	2½	7.6																		
	...	...	2	8.3																		
	...	...	2½	8.7																		



For Power Industries
160 F surface temp

35 psig.	to 35 psig.	to 100 psig	to 235 psig.
to 600 F	to 787 F	to 338 F	to 600 F
170 F	187 F	238 F	320 F

IPS	F	ST	BT*	HL	E	ST	BT*	HL	E	ST	BT*	HL	E

specifications

[illegible] pipe insulation

for hot and cold lines 450 F to minus 120 F

[illegible] lines to 450 F

[illegible] applicable specifications

[illegible]-552 Insulation Pipe Covering, Thermal, and Insulator Blanket, Thermal, Pipe Covering Type I, Class A and B

[illegible]-562 Insulation, Thermal, Mineral Wool, Block or Board and Pipe Insulation (Molded Type) Type II, Class 2 and 3

[illegible] Specification 281-51T

1. **Insulating materials**—All heated pipes shall be insulated to the thickness noted on drawings or as shown on pages 6 and 7 with Fiberglas Pipe Insulation as manufactured by Owens-Corning Fiberglas Corporation.

2. **Application**—All Pipe Insulation shall be applied over clean, dry surfaces, butting adjoining sections firmly together and [illegible] canvas, when furnished, smoothly over joints. Longitudinal and circumferential joints need not be pasted with finishing cement.

Insulation on pipes over 12" diameter shall be wired or banded in place at not greater than 12" centers. Where double layer insulation is applied, the first layer shall be wired in place and the second layer shall be applied with [illegible]

All flanges, valves and fittings shall be insulated with Fiberglas [illegible] insulation of a thickness equal to the insulation on the pipe. Insulation on pipe sizes 3" and smaller may be [illegible] Insulating Cement of equal thickness.

3. **Surface finish**—Where piping is subject to abrasion or mechanical damage, apply a protective finish other than the factory [illegible] canvas. Metal jacketing is used if specified.

Pipe [illegible] shall be finished with approved weather resistant [illegible] aluminum jacketing with all lon-

---

[illegible]ed water and duct-temp piping 35 F to 200 F

[illegible] applicable specification

[illegible]-562 Insulation, Thermal, Mineral Wool, Block or Board and Pipe Insulation (Molded Type) Type II, Class 2 and 3

1. **Insulating materials**—All cold pipes shall be insulated to the thickness noted on drawings or as listed in the table on pages 6 and 7 with Fiberglas White FRJ Jacketed Pipe Insulation as manufactured by Owens-Corning Fiberglas Corporation.

2. **Application**—Fiberglas White FRJ Pipe Insulation shall be applied over clean dry surfaces with the pipe at approximately room temperature. Adjoining sections shall be butted firmly together and the longitudinal seam of the vapor barrier jacket shall be sealed with a white fire-resistant vapor barrier lap adhesive (Foster 81-99 or equal). End joints shall be sealed with the lap adhesive. If multiple layer construction is used joints need not be staggered.

Ends of [illegible] shall be sealed off with fire-resistant vapor barrier [illegible] (Foster [illegible] or equal) at all flanges, valves and [illegible] at intervals of not more than 21 feet [illegible]

All flanges, valves and fittings shall be insulated with molded or fabricated insulation of a thickness equal to that of the insulation on the adjoining pipe, securely fastened in place.

When [illegible] contact with the pipe, clamp hangers shall be insulated separately in the same manner as fittings. The insulation shall be applied vapor-sealed along the vertical hanger rod to a point [illegible] 4 times the pipe insulation thickness and [illegible]

[illegible] water and special process 34 F. to minus 120 F.

[illegible] applicable specification

[illegible]-562 Insulation, Thermal, Mineral Wool, Block or Board and Pipe Insulation (Molded Type) Type II, Class 2 and 3

1. **Insulating materials**—All cold pipes shall be insulated to the thickness noted on drawings or in accordance with the manufacturer's thickness recommendations with Fiberglas [illegible] Pipe Insulation as manufactured by Owens-Corning Fiberglas Corporation.

2. **Application**—Fiberglas FRJ Pipe Insulation shall be applied over clean dry surfaces with the pipe at approximately [illegible]

All flanges, valves and fittings shall be insulated with molded or fabricated insulation of a thickness equal to that of insulation on the adjoining pipe, securely fastened in place.

When in direct contact with the pipe, clamp hangers shall be insulated separately in the same manner as fittings. The insulation shall be applied vapor-sealed upward along the vertical hanger [illegible] 4 times the pipe insulation thick-

The following specifications are necessarily general in nature. Application procedure and material approval is at the discretion and responsibility of the design engineer to meet specific job requirements.

...ional joints lapped not less than 3" and sealed on 12" centers. All circumferential joints may be lapped not less than 3" or be covered with not less than 4" wide strips of the same material securely fastened with bands.

Fabricated insulations on flanges, located indoors, other than molded fitting insulation, shall be covered with ⅛" coat of O-C Insulating Cement. Insulation located indoors shall be further finished with canvas neatly adhered and sized with Foster Lagfas or Arabol 60-89-35.

All insulation on flanges, valves and fittings located outdoors shall be covered with Foster 30-36 Mastic or equal, reinforced with an open mesh glass fabric. Mastic shall be applied in two coats of sufficient thickness to give a ⅜" dry film and shall be troweled neatly over the jacket and lapped over the jacket on the adjacent pipe.

---

2. Insulation on flanges, valves and fittings indoors shall be vapor sealed with a positive vapor barrier such as or equal to 0.002" aluminum foil lapped onto the adjoining insulation. Further finish the fitting with a brush coat of Foster 30-36 followed by an application of 8-oz. canvas and a second coat of sealer.

Piping located outdoors shall be finished with embossed .016" aluminum jacket or a layer of 45-lb. roofing felt lapped three inches at all joints with the lap joint in a 4 o'clock position to shed water. The cover shall be held in place by soft aluminum bands on 12" centers or loops of 16 gauge galvanized soft annealed wire spaced on not more than 8-inch centers. Nothing shall be allowed to pierce jacket at any point.

Outdoor fittings shall receive a final coat of ⅛" thick Sealfas 30-36 or equal, weatherproof aluminum paint or a trowel coat of asphalt reinforced with glass fabric.

...water. The cover shall be held in place by soft aluminum bands on 12" centers or ... of 16-gauge galvanized soft annealed ... spaced no more than 8-inch centers. ... shall be allowed to pierce jacket at ...

...ion on flanges, valves and fittings ... vapor sealed with 0.002" aluminum ... ed or crinkled in place lapping ad... ...et at least one inch. Foil shall be ... with an ⅛ inch layer of a vapor seal ... troweled neatly over the fitting with ... jacket on the adjacent pipe insulation ... at least 2" over the mastic. Outdoor ... these elements shall include a second ... coat of a suitable weather-resist... , such as Foster 60-30 N, reinforced ... light exterior wrapping of open mesh ... fabric troweled well into mastic.



Fibers or Sectional Pipe Insulation with Fire Retardant vapor barrier jacket is sealed in place with a white vapor barrier pipe insulation adhesive. The adhesive is brushed or troweled on the laps of the jacket and on the factory-furnished end joint sealing strips.



Points are supplied for placing over the ... of the end joint sealer strips and ... ...er of each section for holding ... ...sive sets.



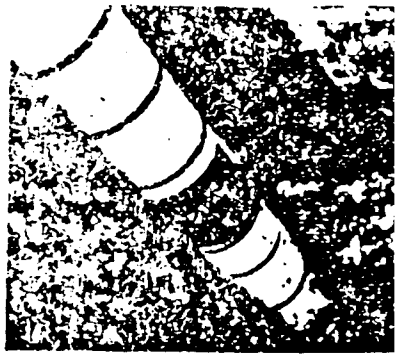
Fittings are insulated with mitered pieces of insulation and vapor sealed with cut-end to brush coat of vapor barrier sealer reinforced with 8-oz. canvas cloth finished with a second coat of sealer. Pre-molded fitting insulation may also be used.



...layer applications and staggered ... construction are recommended to build ... thicknesses on low temperature lines. (See ... 12 and 13 for nesting sizes.) The ... over vapor locker flaps must be care... sealed with vapor barrier adhesive. For ... applications additional weatherproof ... is required.



A foil barrier on fittings ensures a continuous unbroken vapor barrier. The .002" aluminum foil is molded into place over the insulation, covered with vapor barrier sealer and glass fabric reinforcement. Insulation on all flanges and hangers require sealing of ... pipe and straight runs every 21 feet.



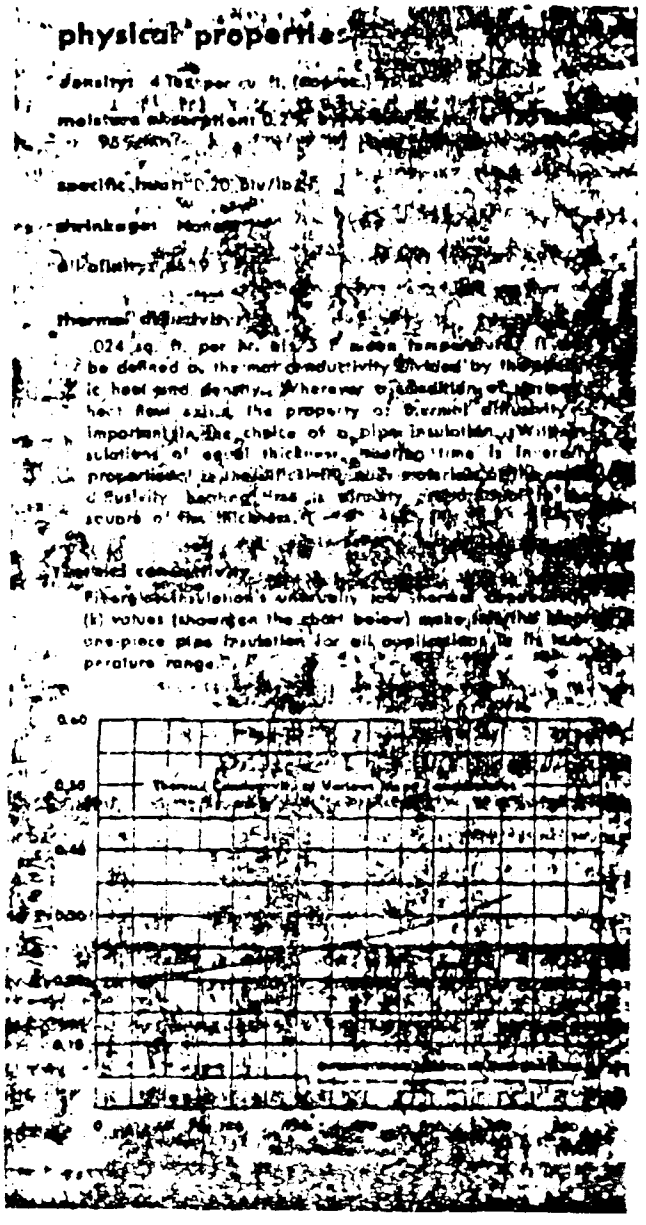
At the saddle or trapeze hangers a metal ... is required to support the insulation ... Sheet is to be 12 ga. and three ... the diameter of the pipe, in length ... a minimum of 12".

one-piece pipe insulations

multi-purpose insulation for piping & copper tubing from —30 F to 400 F



Fiberglas One-Piece Pipe Insulation is available in 180 different thickness-size-length-jacket combinations — for most all large and small piping and copper tubing sizes.



description

Fiberglas One-Piece Pipe Insulation is a resilient, lightweight fiber glass insulation molded from fine glass fibers. It is produced in one-piece cylinders—in sizes up to 33" IPS—with a single longitudinal seam that is opened to apply to the pipe and closes after it is in place. This unique feature offers faster application and better handling characteristics. This multipurpose one-inventory pipe covering is designed for use on pipe and copper tubing lines from—30 to 400 F. It possesses exceptionally high thermal efficiency — in a range of wall thicknesses from ½" to 2" — making possible savings of lesser thicknesses than other pipe coverings to get greater heat-saving economies. Fiberglas One Piece Pipe Insulation is not affected by moisture, will not corrode metal, will not shrink, and will accommodate line expansion and contraction without cracking.

jackets

Fiberglas One-piece Pipe Insulation is available with a choice of factory applied jackets for appearance and certain functional purposes.

Flame Retardant Jacket (FRJ)—A laminate of aluminum foil and special embossed kraft paper with a flame retardant vapor barrier adhesive, reinforced with glass fibers for high tensile strength. This jacket is available in both white and kraft exterior finishes. A special embossed kraft exterior gives a satisfactory finished appearance but to maintain the flame retardant characteristics, it is recommended that no further finish be applied.

Universal—A heavy, white kraft paper is luminated to an aluminum vapor barrier facing of aluminum foil. This white Universal jacket enables Fiberglas Low Pressure Pipe Insulation to insulate tubing and piping from 50 F to 250 F, but may not be used outside of this temperature range with thicknesses of insulation greater than 3".

Canvas—The standard weight canvas jacket suits heated lines to 400 F. A heavier jacket, 6 or 8 oz. canvas is available on request at a slight additional cost.

Low Temperature—A 3-ply laminate consisting of aluminum foil sandwiched between two layers of special kraft paper. The slightly crinkled exterior presents an attractive appearance and doesn't require additional painting under normal conditions.

advantages

one piece means quick, easy, economical application — even in large sizes — with savings up to 50%. Unjacketed 6' long sections available for large pipe sizes.

light weight — down to 1/10 that of other insulations — means less material to handle and apply.

easy fabrication — only a knife needed for the most intricate shapes — reduces clean-up time.

no shrinkage — fibers at joints mesh tightly, eliminating post-application sealing.

resilient dimensional stability resists mechanical damage before, during and after application. Does not break.

choice of jackets for function and/or appearance.

multipurpose, single-inventory product cuts stock to a minimum.

economy due to superior thermal efficiency, with equal or better performance than other insulations.

permanent, inorganic, fire-safe glass fiber construction will never rot or assist corrosion. Dries out quickly when wet; lasts indefinitely.

*T. M. Owens-Corning Fiberglas Corp.



specifications

cable specifications

Hot Water, Cold Water and Low Pressure Steam lines: 50 to 250 F

-352 Insulation Pipe Covering, Thermal, and Insulation Blanket Thermal, Pipe Covering Type I, Class A and B

Heated Lines: up to 400 F

-362 Insulation, Thermal, Mineral Wool, Block or Board and Pipe Insulation (Molded Type) Type II, Classes 2 and 3 ASTM Specification 281-51T

Cold and Dual Temperature Piping: 35 to 200 F

-3?? ow Temperature Lines: 34 to −30 F

recommended thicknesses

iron pipe — RT—recommended thickness
copper tubing — HL—heat loss Btu/lin. ft./hr.
HG—heat gain Btu/lin. ft./hr.

1. Insulating Materials

All piping shall be insulated with One-Piece Fiberglas Pipe Insulation as manufactured by Owens-Corning Fiberglas Corporation to the thickness as noted on drawings.

2. Application

a Hot Water, Cold Water and Low Pressure Steam Lines: 50 to 250 F (*See page 8.*)

b Heated Lines: up to 400 F (*See page 8.*)

c Cold and Dual Temperature Piping: 35 to 200 F. (*See page 8.*)

d Low Temperature Lines: 34 to −30 F (*See page 8.*)

True economic thickness can now be calculated quickly and easily by following the system provided in the new Fiberglas Insulation Engineering "Economic Thickness Manual." Obtain a copy from your local Fiberglas branch office.

cold water, hot water & low pressure steam lines
recommended for greater heat savings

	ambient air at 80 F						ambient air at 90 F		ambient air at 80 F									
pipe temp.	150 F		200 F		250 F		50 F*		200 F		250 F		300 F		350 F		400 F	
ins. t.m.	70 F		120 F		170 F		40 F		130 F		170 F		220 F		270 F		320 F	
	RT	HL	RT	HL	RT	HL	RT	HG	RT	HL	RT	HL	RT	HL	RT	HL	RT	HL
	1/2	8	1/2	14	1/2	21	1/2	4	1/2	14	1	21	1	25	1 1/2	27	2	29
	1/2	10	1/2	15	1/2	27	1/2	5	1/2	17	1	27	1	30	1 1/2	31	2	34
	1/2	13	1/2	24	1/2	36	1/2	6	3/4	23	1	35	1	31	1 1/2	34	2	37
	1/2	14	1/2	25	1/2	38	1/2	7	3/4	25	1	39	1 1/2	29	1 1/2	37	2	43
	1/2	18	1/2	32	1/2	48	1/2	8	3/4	24	1	3	1 1/2	32	1 1/2	42	2	48
	1/2	19	1/2	34	1/2	53	1/2	10	3/4	26	1	43	1 1/2	38	1 1/2	49	2	51
	1/2	23	1/2	41	1/2	62	1/2	12	3/4	32	1	4	1 1/2	47	2	50	2 1/2	62
	1/2	29	1/2	52	1/2	79	1/2	15	3/4	42	1	44	1 1/2	50	2	54	2 1/2	59
	1/2	33	1/2	59	1/2	89	1/2	17	3/4	43	1	45	1 1/2	61	2	64	2 1/2	60
	1/2	36	1/2	65	1/2	95	1/2	18	3/4	39	1	57	1 1/2	60	2	64	2 1/2	67
	1/2	28	1/2	52	1/2	78	1/2	15	3/4	52	1	74	1 1/2	74	2	76	2 1/2	69
	1/2	43	1/2	77	1/2	117	1/2	28	3/4	56	1	75	1 1/2	72	2	76	2 1/2	79
	1/2	53	1/2	97	1/2	143	1/2	32	3/4	60	1 1/2	81	1 1/2	85	2	86	2 1/2	88
	1/2	61	1/2	109	1/2	164	1/2	35	1	64	1 1/2	87	1 1/2	92	2	97	2 1/2	101
	1/2	67	1/2	120	1/2	181	1/2	38	1	69	1 1/2	93	1 1/2	102	2	106	2 1/2	107
	1/2	73	1/2	132	1/2	197	1/2	46	1	76	1 1/2	102	2	112	2	111	2 1/2	117
	1/2	88	1/2	158	1/2	237	1/2	66	1	89	1 1/2	119	2	129	2	126		
	1/2	86	1/2	157	1/2	235	1/2	48	1	87	1 1/2	96	1 1/2	131	2	136		
	1/2	85	1/2	164	1/2	251			1	96	1 1/2	105	1 1/2	143				
	1/2	8	1/2	14	1/2	22	1/2	86										
	1/2	10	1/2	19	1/2	28	1/2	85										
	1/2	14	1/2	25	1/2	37	1/2	83										
	1/2	14	1/2	26	1/2	38	1/2	84										
	1/2	16	1/2	29	1/2	43	1/2	84										
	1/2	19	1/2	34	1/2	50	1/2	84										
	1/2	21	1/2	39	1/2	58	1/2	84										
	1/2	24	1/2	44	1/2	66	1/2	84										
	1/2	28	1/2	49	1/2	99	1/2	84										
	1/2	31	1/2	55	1/2	84	1/2	84										
	1/2	37	1/2	66	1/2	99	1/2	84										

nearest Fiberglas Branch Office for heat loss values above 12"

cold and dual-temperature lines (90 F at 80% R.H.)

pipe surface temperature	50 F or above		49 F to 35 F		34 F to 0 F		0 F to −30 F	
	RT	HG	RT	HG	RT	HG	RT	HG
	1/2	4	3/4	5	1	8	1 1/2	8
	1/2	5	3/4	6	1	9	1 1/2	10
	1/2	6	3/4	7	1 1/2	8	1 1/2	11
	1/2	7	3/4	8	1 1/2	9	1 1/2	12
	1/2	8	3/4	9	1 1/2	10	1 1/2	13
	1/2	10	3/4	11	1 1/2	12	1 1/2	15
	1/2	12	3/4	13	1 1/2	15	2	15
	3/4	11	3/4	15	1 1/2	16	2	17
	3/4	12	1	12	1 1/2	18	2	19
	3/4	13	1	14	1 1/2	18	2	20
	3/4	14	1	15	1 1/2	22	2	23
	3/4	15	1	19	1 1/2	23	2	23
	3/4	17	1	22	1 1/2	25	2	26
1		18	1	25	1 1/2	28	2	29
1		20	1	27	1 1/2	31	2	32
1		22	1	29	1 1/2	34	2	35
1		25	1	32	1 1/2	36	2	38
1		25	1	34	1 1/2	39	2	41
1		26	1	35	1 1/2	43	2	44

Basic data for Kaylo Insulations

This table presents reference data for information on the [illegible] thicknesses according to the simplified Dimensional [illegible] system.

The following data are presented to aid in the design of [illegible] insulation modified to meet specific needs. Recommendations are generalized and should be modified to [illegible] conditions and job requirements.

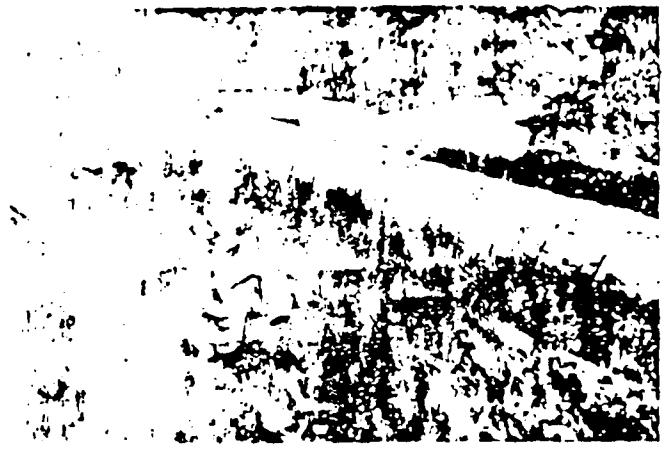
Importance of calculating economic thickness

[illegible] of insulation thicknesses for any specific applica[illegible] take into consideration at least the following [illegible]

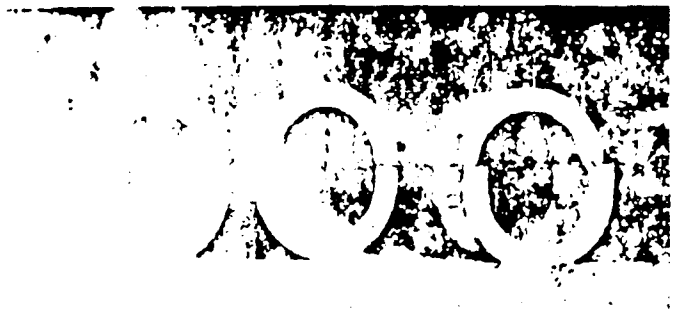
1. Cost of insulation applied
2. Cost of heat energy
3. Cost of capital
4. Depreciation period—plant and insulation
5. Capital investment in heat production equipment
6. Temperature differential
7. Size of the pipe or surface
8. Conductivity of insulation

To assist the engineer, Owens-Corning Fiberglas has taken the figures provided by the National Insulation Manufacturers Association in their manual, "How to Determine Economic Thickness of Insulation" and, by pre-calculating many of the equations on a computer, has created a quick, simple system for resolving economic thickness. To obtain your copy of this Dividend Engineering "Economic Thickness Manual," contact your local Fiberglas branch office. *Your local Fiberglas representative will be glad to explain* this quick, practical method for computing economical thickness under all normal operating conditions.

[illegible]plications—Kaylo and Kaylo-Klad



[illegible] yard steam insulated with Kaylo Pipe Insu[illegible]tion for [illegible]ency and controlled temperatures at [illegible]nt point.



New Kaylo Trace Line pipe insulation and Kaylo Klad Trace Line Pipe Insulation (jacketed with .016 embossed aluminum or .010 stainless steel) provide great economy in the insulation of trace lines.

These pre-molded trace line insulations are designed for insulating piping 2" IPS x 1" thick up to 8" IPS x 2" thick together with a 1" trace line.

Advantages of this Kaylo molded insulation include higher strength, more rigid construction and, in the case of Kaylo Klad, single application of both insulation and weather proofing. Application and maintenance costs are both reduced. Where a trace line is greater than one inch, an extended leg insulation can be fabricated to special order; contact your local OCF Branch Office.

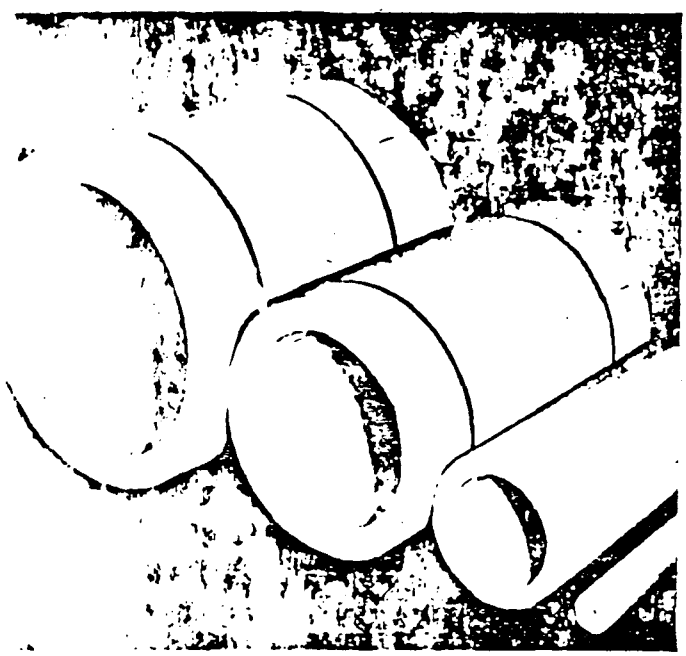




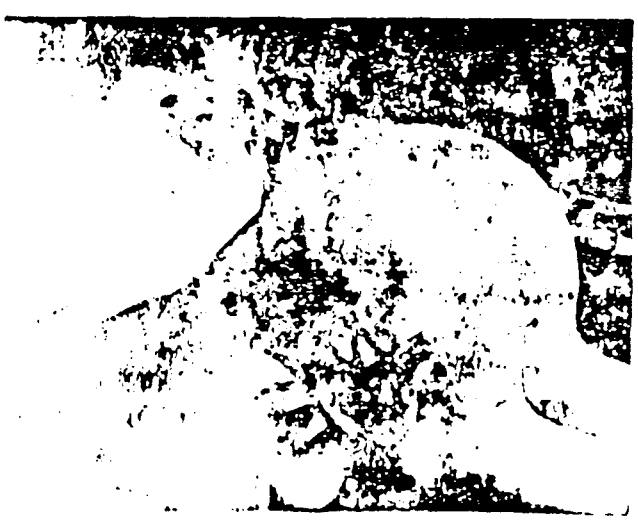


▲ Kaylo-Klad aluminum jacket "locks out" the weather. The longitudinal seam joint and end joint band, with integral mastic, provide positive weather protection.

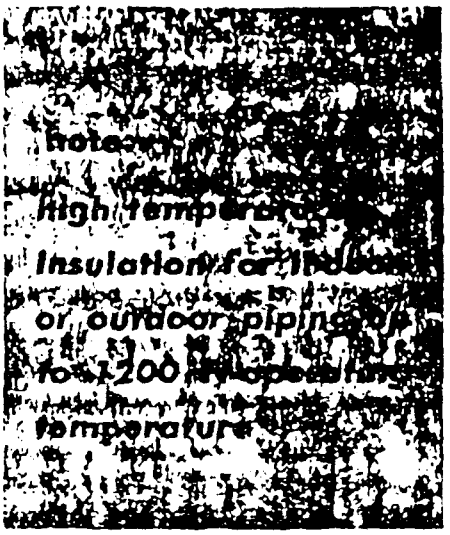
KAYLO pipe insulation



Kaylo pipe insulation applies easily and quickly with standard application methods. Ordinary tools of the trade are sufficient for all cutting, sewing or scoring. It is non-irritating to the skin and non-toxic.



Kaylo Pipe Insulation presents a superior final appearance when applied to a variety of irregularly-shaped high temperature vessels.



(for temperatures ranging from 1200 F to 1800 F, see Kaylo-20)

Kaylo® pipe insulation, a near white, rigid hydrous calcium silicate heat insulation, manufactured by Owens-Corning Fiberglas Corporation, effectively insulates indoor and outdoor piping to 1200 F. A chemically reacted material, Kaylo pipe insulation contains no added binders. For mechanical effects, a small amount of asbestos fiber is mechanical at the time of manufacture.

This thoroughly tested and field-proven material contains the physical properties most desired for efficient, durable insulation work. It retains an appreciable percentage of its strength even after complete saturation in water, original efficiency returning after drying. The effectiveness, high strength and moisture resistance are unattained by most other insulating materials.

sizes

thickness—Kaylo Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes—Kaylo Pipe Insulation is available to fit pipe from ½" to 39" in diameter. Kaylo Tube Insulation will fit copper tubing from ½" to 3⅛" in diameter.

forms—Kaylo Pipe Insulation is available in sectional or multisegmental form depending upon pipe size. All insulation is furnished in 3 ft. sections.

jackets

canvas—Kaylo Sectional Pipe Insulation includes standard canvas jackets, at no additional charge, on thicknesses up to and including 2½". Standard canvas is available for segmental forms at a slight additional cost. Bands are available for use with this product at slight additional charge and will be furnished on request.

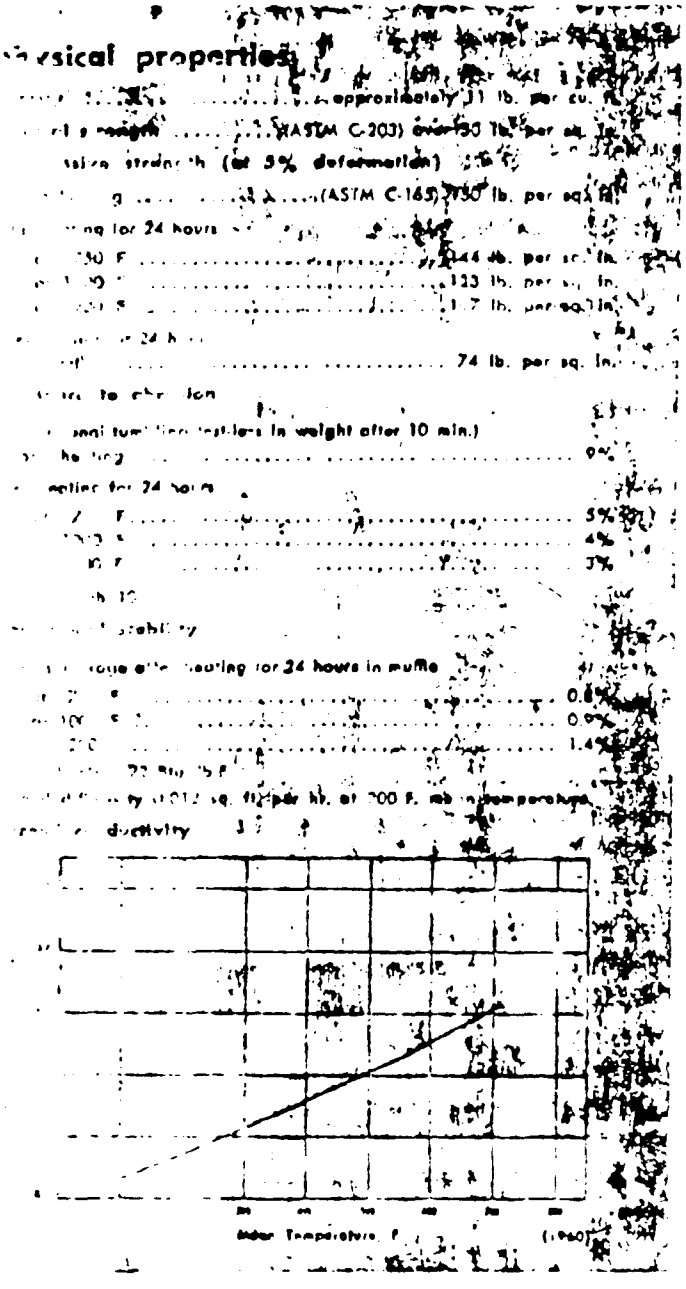
6 oz. and 8 oz. canvas jackets are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms they are furnished but not adhered.

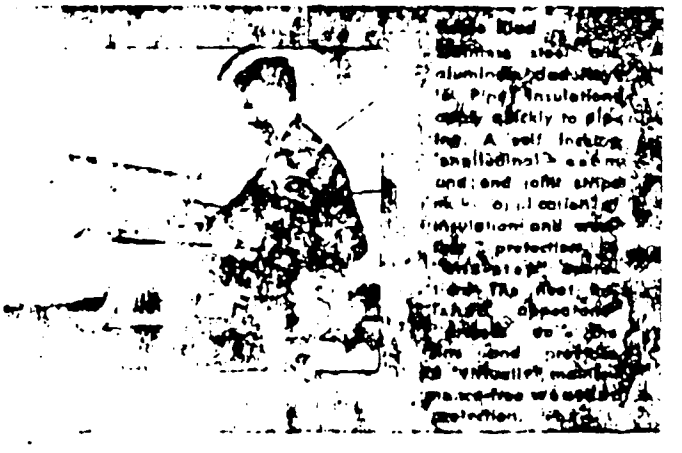
Kaylo Kled—Kaylo is also available with a soft rippled embossed aluminum jacket .016" thick or .010 stainless steel jacket. These jackets provide greater resistance to mechanical damage and present a neat finished appearance to pipe lines. The longitudinal seam has a self-locking joint. Joint bands with integral mastic are furnished for sealing end joints.

limitations

Kaylo Pipe Insulation is designed for temperatures up to 1200 F and is not recommended when operating temperatures of piping exceed this limit.







specifications

for insulation of piping with Kaylo

applicable specifications

HH-I-523a Insulation Block, Pipe Covering and Cement, Thermal, Calcium Silicate (for Temperatures up to 1200° F) class II (pipe covering)

MIL-I-2781C Insulation Pipe Covering, Thermal, Grade I Class B, Grade II Class D, Grade III Class E.

1. Insulating materials

All heated pipes shall be insulated with Kaylo Pipe Insulation as manufactured by Owens-Corning Fiberglas Corporation, to the thickness noted on drawings or as shown in the table.

2. Application

All Pipe Insulation shall be applied over clean, dry surfaces, butting adjoining sections firmly together and mitered canvas, when furnished, smoothly over joints. Longitudinal and circumferential joints need not be pointed with finishing cement to conserve heat.

Insulation on pipes over 12" diameter and all outdoor piping shall be wired in place with 16 gauge soft annealed wire on no greater than 9" centers. Where double layer insulation is applied, the first layer shall be wired in place without jacket; the second layer shall be applied with all joints staggered.

All flanges, valves and fittings shall be insulated with Fiberglas molded fitting insulation or fabricated mitered segments of pipe insulation equal in thickness to the insulation on the adjoining pipe. Fittings on pipe sizes 3" and smaller may be insulated with O-C 110 Insulating Cement of equal thickness.

3. Surface finish

Indoor piping under 12" diameter not subject to abrasion or mechanical abuse requires no finish in addition to the factory-furnished canvas. Piping over 12" diameter shall be finished with 6-ounce canvas pasted in place.

Piping located outdoors shall be finished with 45-lb. roofing felt jacket with all joints lapped not less than 2". Jackets shall be wired with 16 ga. copper wire on not greater than 9" centers or banded on 12" centers with ½" galvanized bands. Other suitable weatherproof jackets such as metal, asphalt or plastic coating may be applied according to the jacket manufacturers' specifications.

Insulation on flanges, valves and fittings shall be covered with a ¼" coat of O-C 110 Insulation Cement. Insulation located indoors shall be further finished with 6 oz. canvas neatly pasted in place.

All insulation on flanges, valves and fittings located outdoors shall be covered with asphalt weatherproof mastic reinforced with an open mesh glass fabric. Mastic shall be applied in sufficient thickness to give a ⅛" dry coat and shall be troweled neatly over the fitting with the jacket on the adjacent pipe insulation lapped at least 2" over the mastic.

The foregoing is necessarily general in nature. Application procedure and material approval is at the discretion and responsibility of the design engineer to meet specific job requirements.



recommended thicknesses—Kaylo†

(ambient still air at 80 F)

pipe temp. °	280 F				480 F				680 F			
temp. dif.	200 F				400 F				600 F			
pipe size	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST
	1	346	77.0	100	1½	52.5	86.7	107	2	77.0	90.6	110
	1	34.2	79.5	104	1½	60.0	87.6	110	2½	74.4	92.7	103
1	1	35.9	81.6	101	1½	65.3	89.0	109	2½	85.9	93.1	106
1¼	1	45.8	82.0	108	1½	73.2	90.1	110	2½	98.3	93.7	109
1½	1	46.1	84.0	104	2	65.8	92.2	103	3	89.0	95.0	102
	1	53.1	84.9	105	2	80.3	92.8	107	3	108	95.1	108
2½	1	61.5	85.5	106	2	83.7	93.3	105	3	115	96.1	107
	1	72.7	85.7	108	2½	90.8	93.9	104	3½	124	96.1	107
3	1	86.4	86.5	108	2½	107	94.4	105	3½	146	96.4	108
	1½	100	86.5	110	2½	126	94.6	107	3½	164	96.7	110
4	1½	94.2	90.0	103	2½	133	94.6	109	4	170	97.1	107
	1½	102	90.3	103	2½	167	94.8	109	4	190	97.2	108
5	1½	114	90.4	104	2½	174	95.0	110	4	210	97.2	109
	1½	125	90.4	104	2½	188	95.2	110	4	222	97.4	110
	1½	133	90.8	104	3	179	95.9	106	4½	226	97.6	108
	1½	150	91.0	104	3	210	95.9	107	4½	253	97.7	109
6	1½	170	90.4	106	3	235	95.8	108	4½	275	97.7	109
	1½	201	90.4	107	3	255	95.9	109	5	296	97.9	108
	1½	223	90.5	108	3	285	96.0	110	5	320	97.9	109
	1½	246	90.5	108	3½	272	96.5	106	5	353	97.9	110
	1½	291	90.5	108	3½	319	96.6	107	5½	364	98.2	108

†True economic thickness can now be calculated quickly and easily by following the system provided in the new Fiberglas Dividend Engineering "Economic Thickness Manual". This is available from your local Fiberglas branch office.

KEY

RT— Recommended Thickness.

HL— Heat Loss Btu/Lin. ft./hr.

E— Insulation Efficiency.

ST— Surface Temperature.*

C— Commercial and Industrial

U— Power and Utility

P— Process Industries

pipe temp. °	280 F				480 F				680 F				880 F				1080 F				1200 F			
temp. dif.	200 F				400 F				600 F				800 F				1000 F				1120 F			
pipe size	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST
¾	1	28.6	79.0	100	1	63.0	84.0	120	1½	86.0	89.5	119	2	112	92.4	124	2½	128	94.8	118	3	145	95.3	120
1	1	34.2	79.5	104	1	73.2	84.4	128	1½	98.3	90.3	126	2	125	93.2	128	2½	144	95.3	122	3	162	95.8	127
1¼	1	35.9	82.6	101	1	79.2	86.7	123	1½	107	91.4	125	2	136	94.0	127	3	151	96	120	3	184	96.2	133
1½	1	45.8	82.0	108	1½	73.2	90.1	110	1½	120	92.3	127	2½	143	95	123	3	175	96.3	125	3½	200	97.1	128
1½	1	46.3	84.0	104	1½	82.1	90.2	114	2	108	93.9	113	2½	146	95.5	119	3	177	96.8	122	3½	199	97.6	127
2	1	53.5	84.9	105	1½	92.5	91.0	114	2	132	94	121	2½	170	95.8	126	3	208	96.9	130	4	215	97.5	126
2½	1	61.5	85.5	106	1½	96.1	92.3	111	2	137	94.8	117	2½	181	96.3	124	3	206	97.3	129	4	231	97.8	125
	1	72.7	85.7	108	1½	126	93.5	120	2	166	94.9	128	3	197	96.6	124	3½	236	97.6	126	4	267	97.9	130
3	1	86.4	86.5	108	1½	154	91.9	123	2	202	95.0	128	3	222	97	124	3½	274	97.8	130	4½	286	98.2	127
	1	100	86.5	110	1½	177	92.4	123	2½	206	95.9	122	3	266	97.1	128	4	292	98.1	125	4½	326	98.3	130
	1	137	87.1	116	1½	207	92.4	126	2½	239	95.9	125	3½	268	97.5	122	4	332	98.5	129	5	344	98.5	128
	1½	102	90.3	102	1½	224	92.8	125	2½	270	96	127	3½	297	97.6	125	4½	333	98.5	124	5	377	98.6	129
	1½	114	90.4	103	1½	249	92.9	127	2½	287	95.2	127	3½	326	97.7	126	4½	366	98.5	125	5½	389	98.7	126
	1½	125	90.4	104	1½	273	93.0	128	2½	313	96.3	128	3½	353	97.7	127	4½	400	98.5	128	5½	436	98.9	128
	1½	133	90.8	104	1½	292	93.2	127	2½	348	96.3	129	3½	392	97.7	129	4½	440	98.5	130	6	452	98.9	127
	1½	150	91.0	104	1½	338	93.7	128	2½	395	96.4	130	4	410	98	125	5	460	98.8	127	6	510	99.0	129
	1½	170	90.4	106	2	325	94.1	123	3	381	96.8	125	4	447	98	128	5	500	98.7	129	6	556	99.1	131
	2	201	90.4	107	2	357	94.0	124	3	426	96.9	126	4	495	98.1	128	5	563	98.7	130	6	621	99.2	132
	1½	223	90.5	108	2	405	94.2	125	3	480	96.9	127	4	545	98.1	129	5½	545	98.8	127	6	679	99.2	134
	1½	246	90.5	108	2	460	98.4	126	3	535	96.9	128	4	594	98.1	130	5½	605	98.9	128	6	733	99.3	136
	1½	291	90.5	108	2	525	94.3	126	3	610	97	128	4½	618	98.4	126	5½	685	98.9	129	6	841	99.1	137
1	1	28.6	79.0	100	1	63.0	84.0	120	1	108	86.8	147	1½	124	91.6	136	2	146	94.1	134	2	179	94.2	149
	1	34.2	79.5	104	1	73.2	84.4	128	1½	98.3	90.3	126	1½	145	92.1	145	2	166	94.6	141	2½	175	95.5	134
	1	35.9	82.6	101	1	79.2	86.7	123	1½	107	91.4	125	2	136	94.0	127	2½	174	95.4	134	2½	198	95.9	141
	1	45.8	82.0	108	1	102	86.3	124	1½	120	92.3	127	2	160	94.4	133	2½	188	96.1	135	3	211	96.5	137
1½	1	46.3	84.0	104	1	104	87.8	129	1½	135	92.4	132	2	156	95.2	126	2½	207	96.2	142	3	212	96.9	136
	1	53.5	84.9	105	1	118	88.6	131	1½	134	93.0	134	2	189	95.3	135	2½	223	96.7	138	3	250	97.1	140
	1	61.5	85.5	106	1	135	89.1	134	1½	158	94.0	127	2	205	96.4	132	2½	237	97.1	134	3	266	97.4	139
	1	72.7	85.7	108	1	160	89.3	137	1½	207	93.7	140	2	250	95.7	145	2½	292	97.0	147	3	316	97.5	147
2	1	86.4	86.5	108	1	191	89.9	138	1½	249	92.7	147	2	293	96.1	148	3	299	97.6	137	3½	335	97.9	140
	1	100	86.5	110	1	240	89.6	144	1½	297	94.0	149	2½	294	96.8	137	3	347	97.8	140	3½	386	98.0	145
	1	137	87.1	116	1½	207	92.4	126	2	270	95.4	133	2½	337	96.9	139	3	403	98	147	3½	430	98.2	147
	1½	102	90.3	102	1½	224	92.8	125	2	302	95.5	134	2½	375	97.0	141	3½	386	98.3	135	3½	471	98.2	148
	1½	114	90.4	103	1½	249	92.9	127	2	333	95.6	135	2½	399	97.2	140	3½	422	98.2	137	4	474	98.4	142
	1½	125	90.4	104	1½	273	93.0	128	2	349	95.9	134	2½	435	97.2	142	3½	458	98.3	138	4	513	98.5	143
	1½	133	90.8	104	1½	292	93.2	127	2	391	95.8	137	2½	442	97.2	146	3½	504	98.3	140	4	563	98.5	146
	1½	150	91.0	104	1½	338	93.7	128	2	451	95.9	138	2½	563	97.3	148	3½	576	98.3	143	4	642	98.5	148
	1½	170	90.4	106	1½	391	93.0	132	2	515	95.7	143	3	541	97.6	140	3½	642	98.3	147	4½	647	98.7	144
	2	201	90.4	107	1½	441	93.0	133	2	579	95.8	144	3	606	97.6	141	4	642	98.5	140	4½	719	98.7	145
	1½	223	90.5	108	1½	492	93.0	134	2	640	95.9	147	3	671	97.7	142	4	707	98.6	142	5	728	98.8	140
	1½	246	90.5	108	2	541	93.1	134	2½	584	96.2	135	3	735	97.7	144	4	777	98.6	142	5	840	98.9	143
2	2½	291	90.5	103	1½	647	93.1	135	2½	690	97.0	136	3	870	97.7	147	4	903	98.6	144	5	922	98.9	143

*Surface temperatures for Kaylo Klad will be higher due to the emissivity of the aluminum jacket. This will vary with ambient temperature thickness of insulation used. However, the thermal efficiency of the application will be improved slightly by the aluminum jacket.

Where to buy

Fiberglas Industrial Insulations

For additional information, contact your nearest Fiberglas Branch Office listed below. Authorized Distributors maintain stocks in principal cities. Consult the yellow pages for their locations.

Albuquerque, New Mexico		243-4583
Anchorage, Alaska	BR	5-8344
Atlanta, Georgia		799-6821
Baltimore, Maryland	SA	7-0234
Birmingham, Alabama	TR	1-2723
Boise, Idaho		2-3102
Boston, Massachusetts	CE	5-7540
Buffalo, New York	TL	3-4123
Charleston, West Virginia	DI	3-7094
Charlotte, North Carolina	ED	4-6864
Chicago, Illinois	RA	6-0102
Cincinnati, Ohio	AV	1-1173
Cleveland, Ohio	MA	1-6451
Columbus, Ohio	HU	6-9418
Dallas, Texas	RI	1-3982
Dayton, Ohio	AX	3-3155
Denver, Colorado	AC	2-3126
Des Moines, Iowa	AT	8-4273
Detroit, Michigan	LI	7-8000
Evansville, Indiana	HA	5-5124
Fort Wayne, Indiana	EA	4635
Fresno, California	AD	3-7227
Grand Rapids, Michigan	CH	3-3697
Greenville, South Carolina	CE	9-4279
Hartford, Connecticut	CH	7-1301
Honolulu, Hawaii		99-5689
Houston, Texas	JA	6-1851
Indianapolis, Indiana	CL	5-4147
Jacksonville, Florida	EL	5-4188
Kansas City, Missouri	PL	3-7725
Los Angeles, California	RA	3-9781
Louisville, Kentucky	ME	7-2588
Memphis, Tennessee	FA	7-6116
Miami, Florida	OX	6-3451
Milwaukee, Wisconsin	DI	4-3811
Minneapolis, Minnesota	FR	7-1730
Mobile, Alabama	HE	2-4411
Nashville, Tennessee	AL	4-9210
New Orleans, Louisiana		523-2821
New York, New York	PL	9-3810
Oklahoma City, Oklahoma	JA	8-4466
Omaha, Nebraska		553-3291
Peoria, Illinois	PE	4-3232
Philadelphia, Pennsylvania	LO	4-3133
Phoenix, Arizona	AL	8-4541
Pittsburgh, Pennsylvania	AT	1-7191
Portland, Oregon	CA	6-3505
Richmond, Virginia	EL	5-5703
Rochester, New York	BR	1-1888
Rock Island, Illinois		788-1190
North Sacramento, California	WI	2-5467
St. Louis, Missouri	MA	1-6822
Salt Lake City, Utah	EL	9-5247
San Antonio, Texas	CA	4-7673
San Bernardino, California	TU	8-3496
San Diego, California	CY	7-3751
San Francisco, California	UN	1-4721
San Jose, California	CY	7-9520
Seattle, Washington	MA	2-4335
Spokane, Washington	KE	5-3575
Syracuse, New York	GR	4-4646
Tampa, Florida		253-0183
Toledo, Ohio		248-6741
Washington, D. C.	NA	8-0724

INTERNATIONAL S.A., GENERAL OFFICE:
Panama, Republic de Panama,
Apartado 6718, Phone: 3-1650

INTERNATIONAL S.A., BRANCH OFFICES
New York 22, New York, 717 Fifth Ave., PL 9-3810
San Francisco 7, Calif., 1200 17th St. UN 1-4721
San Juan, P. R., First Fed. Savings Cond. Santurce Puerto Rico, 723-8444

OWENS-CORNING FIBERGLAS CORPORATION

Industrial and Commercial Construction Materials Division, 717 Fifth Avenue, New York 22, N. Y.

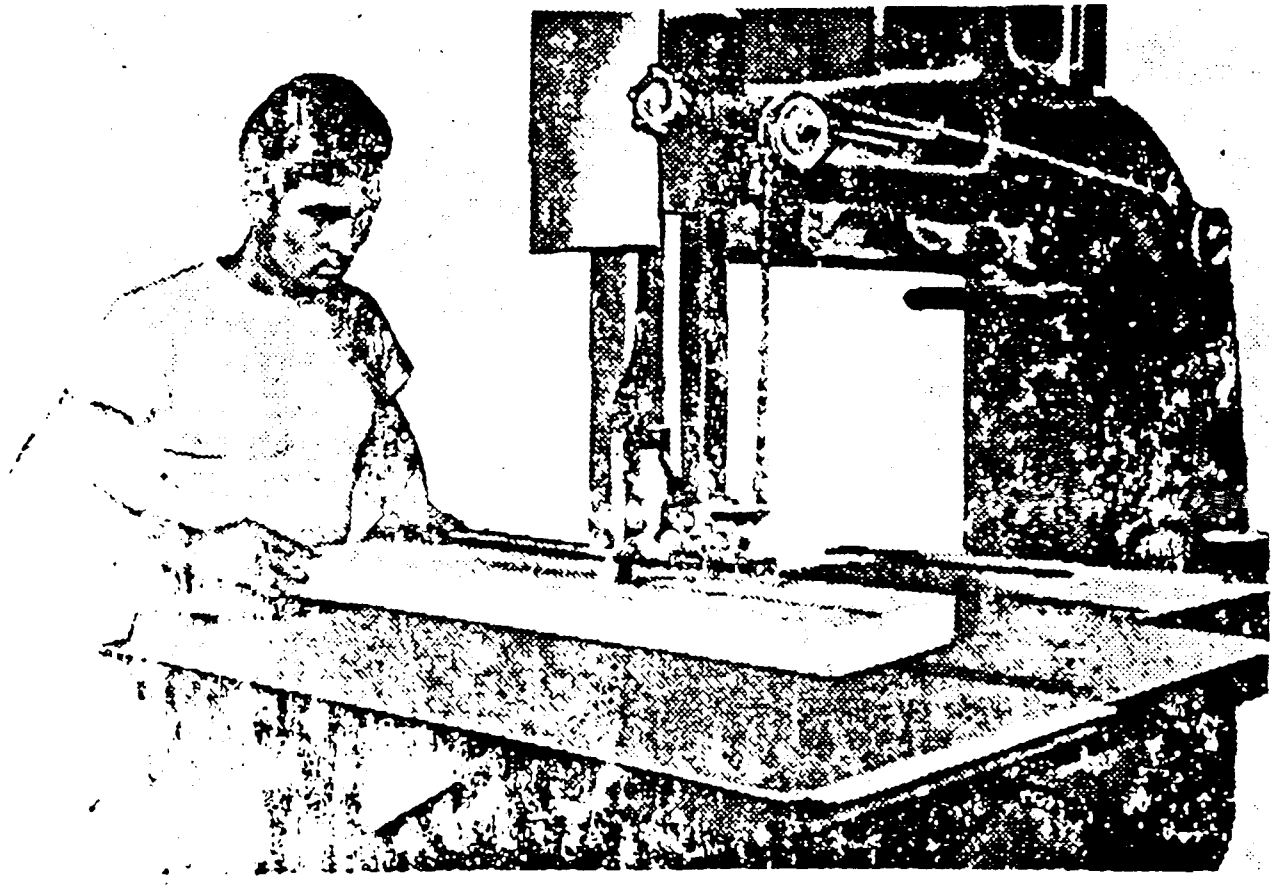
General Offices, Toledo 1, Ohio. Pacific Coast Division, Santa Clara, Calif.

New Product Data

Kaylo Core Material

an easy to fabricate structural insulation

used in panels, partitions and doors



KAYLO CORE MATERIAL

FIBERGLAS

The Fiberglas product described herein is offered for sale under our standard warranty but is subject to modification without notice. Properties and uses other than those given have not been established by tests or experience.

Kaylo Core Material

an easy to fabricate structural insulation

used in panels, partitions and doors

Fiberglas * Kaylo * Core Material is a rigid mineral insulation composed principally of calcium silicate for use as a fire-resistant core for panels, doors and partitions. There are two types of this material:

Kaylo-1200, white in appearance, has a temperature range up to 1200° F and is available in a 20 lbs. (per cu. ft.) or 12 lbs. nominal density.

Kaylo-1800, colored pink, has a temperature range up to 1800° F and is available in a 20 lbs. (per cu. ft.) or 13 lbs. nominal density.

Kaylo Core Material provides rigidity, fire resistance and low thermal conductivity at weights below that of white pine. It also is an excellent barrier to sound transmission, has bondable surfaces, and can be readily fabricated using conventional woodworking tools and practices. All of these characteristics make it a highly desirable component in fire doors, non-warping service doors, partitions and other building elements in panel form.

Since the introduction of Kaylo, it is possible to obtain an Underwriters' Laboratories label for doors even when faces are plastic, wood or a low melting point metal such as aluminum. Kaylo Core does not burn, is rot-proof and vermin-proof and resists water and termites. When used in a door, it will withstand the most severe service, including repeated slamming.

Choice between the various products would normally be made first on the required temperature limit (particularly where fire-rated doors or panels are involved), then upon considerations of thermal conductivity, weight, and fastening or assembly methods. The lower density material is superior in thermal resistance, the high density product has the better bonding properties and greater structural strength.

Kaylo 1800 has excellent machinability, laminates readily and has higher structural strength. During critical exposure to fire, it will display the greater dimensional stability.

Kaylo 1200 has adequate structural strength and dimensional stability and is more economical.

As a guide to assist you in choosing between the two products and the two densities, the following shows which product has generally been used in various panels and doors.

Kaylo 1200, (12 lbs.) - Metal sliding fire-proof doors.

Kaylo 1800 or Kaylo 1200, (both 20 lbs.) - Fire doors, fire-resistant partition panels using various surfaces; wood plastic or metal. Dimensionally stable wood door (non fire door)**.

Kaylo 1200 or occasionally K-1800, (both densities) - Process equipment panels.

uses

Kaylo Core Material is principally used as a core material of laminated structures where the faces or laminates are applied with adhesives and as the core of structural shells or envelopes where the Kaylo Core Material is simply inserted in the open spaces and held by its own contact or by such conventional methods as clips or other attachments.

Kaylo Core has a wide-range of useful properties that afford benefits beyond its basic purpose as a fire-resistant material.

physical properties

NOMINAL DENSITY (p.c.f.)

Kaylo-1200	Kaylo-1800
20	20
12	13

UNDERWRITERS' RATING: Listing (40U8.13)

Flame spread	0
Fuel contributed	negligible
Smoke developed	0

HIGH STRENGTH

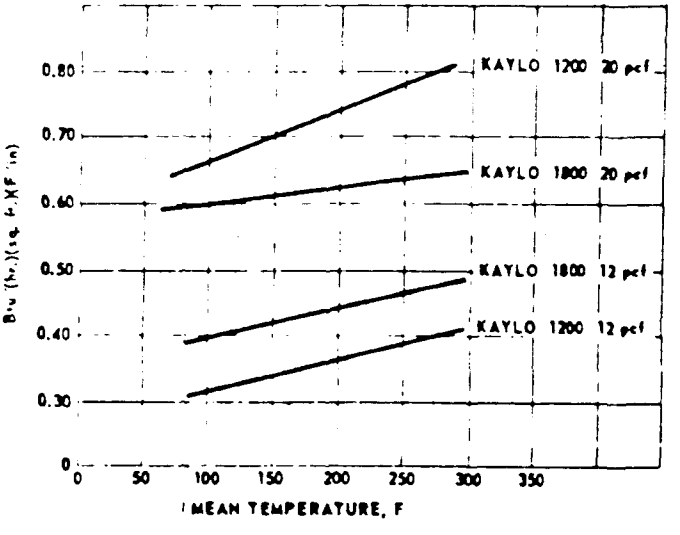
Kaylo-1200

Density	Compressive Strength	Flexural Strength
20 p.c.f.	375 psi (Minimum) @ 10% deformation	175 psi (Minimum)
12 p.c.f.	100 psi (Minimum) @ 5% deformation	40 psi (Minimum)

Kaylo-1800

Density	Compressive Strength	Flexural Strength
20 p.c.f.	375 psi (Minimum) @ 10% deformation	175 psi (Minimum)
13 p.c.f.	75 psi (Minimum) @ 5% deformation	50 psi (Minimum)

CONDUCTIVITY CURVES



Fabrication

Lamination over a Kaylo Insulation Core - Almost any face material may be bonded to Kaylo thermal insulating Block surfaces. Bonding agents can be selected to meet the requirements of the particular facing---also to satisfy the service requirements of the finished product---and still offer some choice in curing procedure.

General Requirements - Manufacturing techniques and procedures have been worked out in detail, and these along with technical advice, testing facilities, and promotional assistance are available from Owens-Corning. For general information though, the following procedures are recommended to those who are considering the use of Kaylo Core Material in a structural sandwich.

All core pieces must be brought to close tolerance in thickness. If a bonded core unit is to be produced, the entire unit may be sanded mechanically on both sides to bring all of the laminating surface to a plane. With individual pieces of core, they must be made plane to tolerances consistent with the type of face materials used and the specifications for planeness of the finished sandwich. Kaylo Core Material is manufactured to a finished tolerance of -0, -1/16 tolerance thickness.

In laminates for which requirements for fire resistance are to be met, it is generally necessary to use tongue-and-groove construction for combustible or low-melting point faces. For faces able to resist fire and its effects, tongue and grooving may not be necessary. If tongue and grooving is used, the depth need not exceed 1/8 inch, but the width of the tongue should be relatively great, on the order of 3/8 inch or more. Such construction is intended to minimize transfer of heat through joints by radiation.

The behavior of panels in fire and in the subsequent fire hose stream of water depends not only on the core but on the face and edge materials and on details of the assembly. Where warping of the panel in fire is an important factor to minimize, the tongue and groove joints mentioned above provide an articulating action between core pieces without disrupting the unity of the panel.

Treatment Prior to Lamination - Kaylo Core Material is porous and due to the finishing operation, is slightly dusty. To obtain better adhesion, a primer is recommended. Several kinds of primer may be used, but they must be compatible with the slight alkalinity of Kaylo Core, and the molecular size of the primer must permit penetration of the solid phase into the pores of the core. Frequently, when solutions of large molecule materials are used as primers, the solvent penetrates the core, leaving the solid phase on the surface with little bond strength. One of the easiest primers to apply is a mixture of phenolic resin diluted with alcohol and water which may be sprayed or applied with a conventional glue spreader. Such a primer dries rapidly and successive units may be handled as easily as primed units.

The face materials applied to the core usually require preparation to provide good bond in the laminate. Metals must be degreased and be clean at the time of laminating; wood must be smooth and not contain excess moisture, plastic and cement products must be smooth and clean when pressed.

In any case, the face materials and the overall design must be suitable for the exposure in service anticipated. While Kaylo Core is not water-soluble and its properties are not destroyed by wetting, it has little heat insulating value when wet, and in the wet state is subject to frost action. Consequently, the design and use must be such that the core remains dry in order for the panel to function as intended. Fire hand assistance is available from Owens-Corning regarding the types and use of primers.

Adhesives - Kaylo may be bonded using most available adhesives, but like all laminates, it is advisable to choose an adhesive which will take advantage of the strengths of the components. The tensile strength of Kaylo Core Material is well in excess of 100 psi. Users of Kaylo Core Material will find it advantageous to work with their suppliers of adhesives and to specify the properties required.

Where to buy

Kaylo Core Material

Available from authorized distributors located in principal cities. Consult the yellow pages of your classified directory for their location or call your nearest Fiberglas Branch Office listed below.

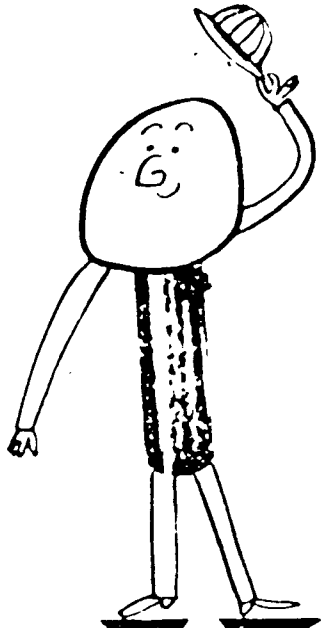
Albuquerque, New Mexico	CH	3-4583
Anchorage, Alaska	BR	5-8344
Atlanta, Georgia	JA	3-6491
Baltimore, Maryland	SA	7-0234
Birmingham, Alabama	TR	1-2723
Boise, Idaho		2-3102
Boston, Massachusetts	HU	2-1937
Buffalo, New York	TL	3-4123
Charleston, West Virginia	DI	3-7094
Charlotte, North Carolina	ED	4-6864
Chicago, Illinois	RA	6-0102
Cincinnati, Ohio	AV	1-1173
Cleveland, Ohio	MA	1-6451
Columbus, Ohio	HU	6-9418
Dallas, Texas	RI	1-3982
Dayton, Ohio	AX	3-3155
Denver, Colorado	AC	2-3126
Des Moines, Iowa	AT	8-4273
Detroit, Michigan	LI	7-8000
Evansville, Indiana	HA	5-5124
Fort Wayne, Indiana	EA	4635
Fresno, California	AD	3-7227
Grand Rapids, Michigan	CH	3-3697
Greenville, South Carolina	CE	9-4279
Hartford, Connecticut	CH	7-1301
Houston, Texas	JA	6-1851
Indianapolis, Indiana	CL	5-4147
Jacksonville, Florida	FL	9-7491
Kansas City, Missouri	PL	3-7725
Knoxville, Tennessee	KN	5-4421
Los Angeles, California	RA	3-9761
Louisville, Kentucky	ME	4-8384
Memphis, Tennessee	FA	7-6116
Miami, Florida	FR	7-2671
Milwaukee, Wisconsin	DI	4-3811
Minneapolis, Minnesota	FR	7-1730
Mobile, Alabama	HE	2-4411
Nashville, Tennessee	AL	4-9210
New Orleans, Louisiana	MA	2821
New York, New York	PL	9-3810
Oklahoma City, Oklahoma	JA	8-4468
Omaha, Nebraska	GL	3291
Peoria, Illinois	PE	4-3232
Philadelphia, Pennsylvania	LO	4-3133
Phoenix, Arizona	AL	8-4541
Pittsburgh, Pennsylvania	AT	1-7191
Portland, Oregon	CA	2-1378
Richmond, Virginia	EL	5-5703
Rochester, New York	BR	1-1888
Rock Island, Illinois		8-1190
North Sacramento, California	WA	2-5467
St. Louis, Missouri	MA	1-6822
Salt Lake City, Utah	EL	9-5247
San Antonio, Texas	CA	4-7673
San Bernardino, California	TU	8-3496
San Diego, California	CY	7-3751
San Francisco, California	UN	1-4721
San Jose, California	CY	5-0321
Seattle, Washington	MA	2-4335
Spokane, Washington	KE	5-3575
Syracuse, New York	GR	4-4646
Tampa, Florida		8-0183
Toledo, Ohio	CH	8-6741
Washington, D. C.	NA	8-0724
INTERNATIONAL		
N. Y. City	PL	9-3810
Panama, Republic de Panama		3-2062
San Francisco, California	UN	1-4721

OWENS-CORNING FIBERGLAS CORPORATION

Industrial and Commercial Construction Materials Division, 717 Fifth Avenue, New York 22, N.Y.

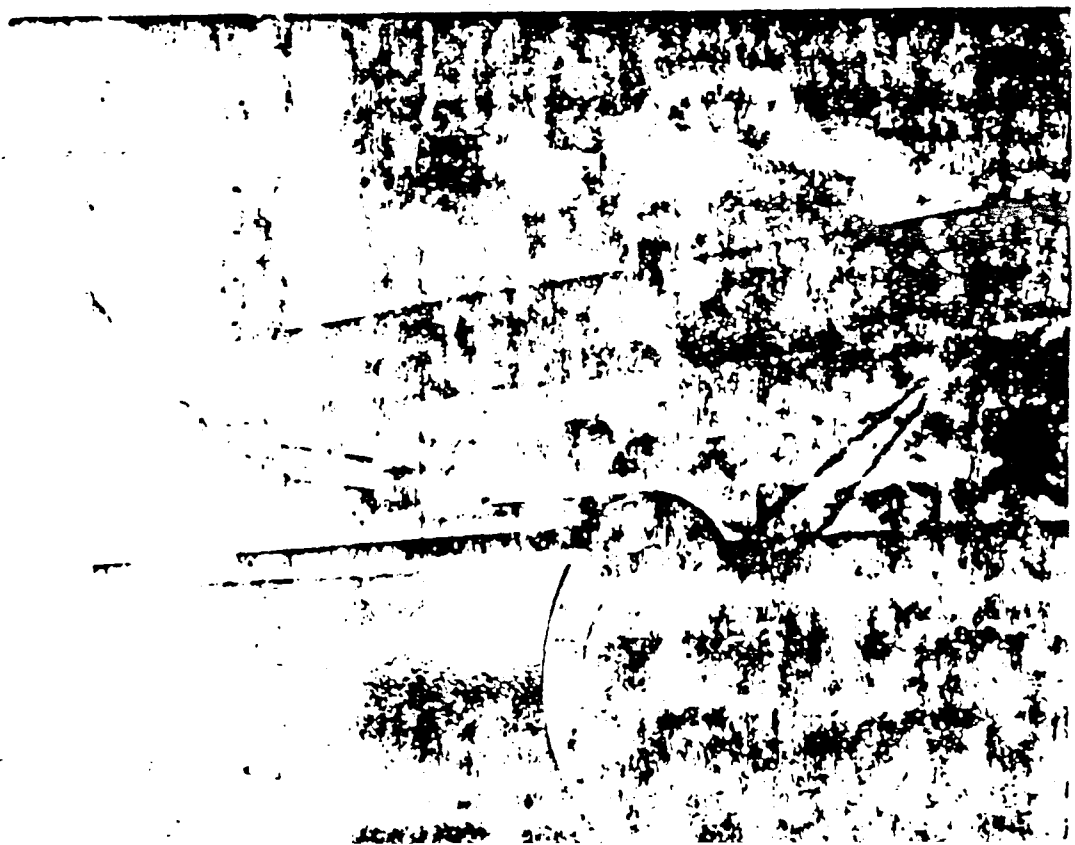
General Offices, Toledo 1, Ohio Pacific Coast Division, Santa Clara, Calif.

Meet the new member
of the FIBERGLAS
Industrial Insulation Family...



MYLO-KLAD

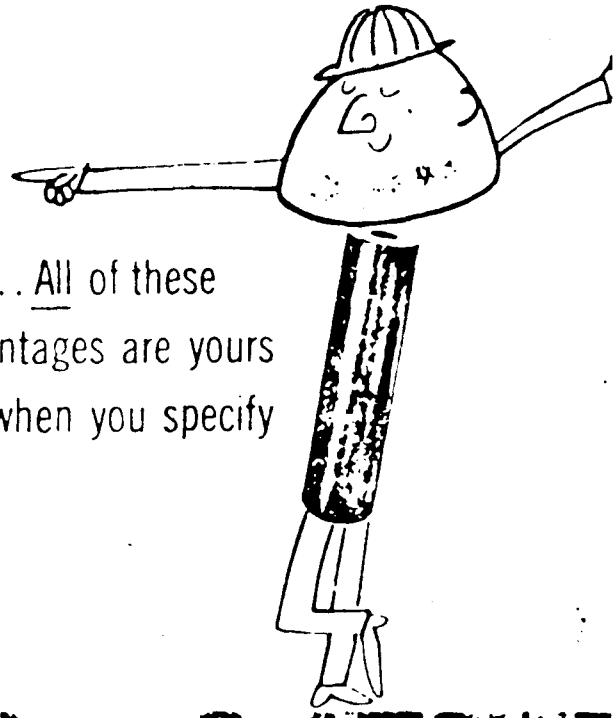
PIPE INSULATION



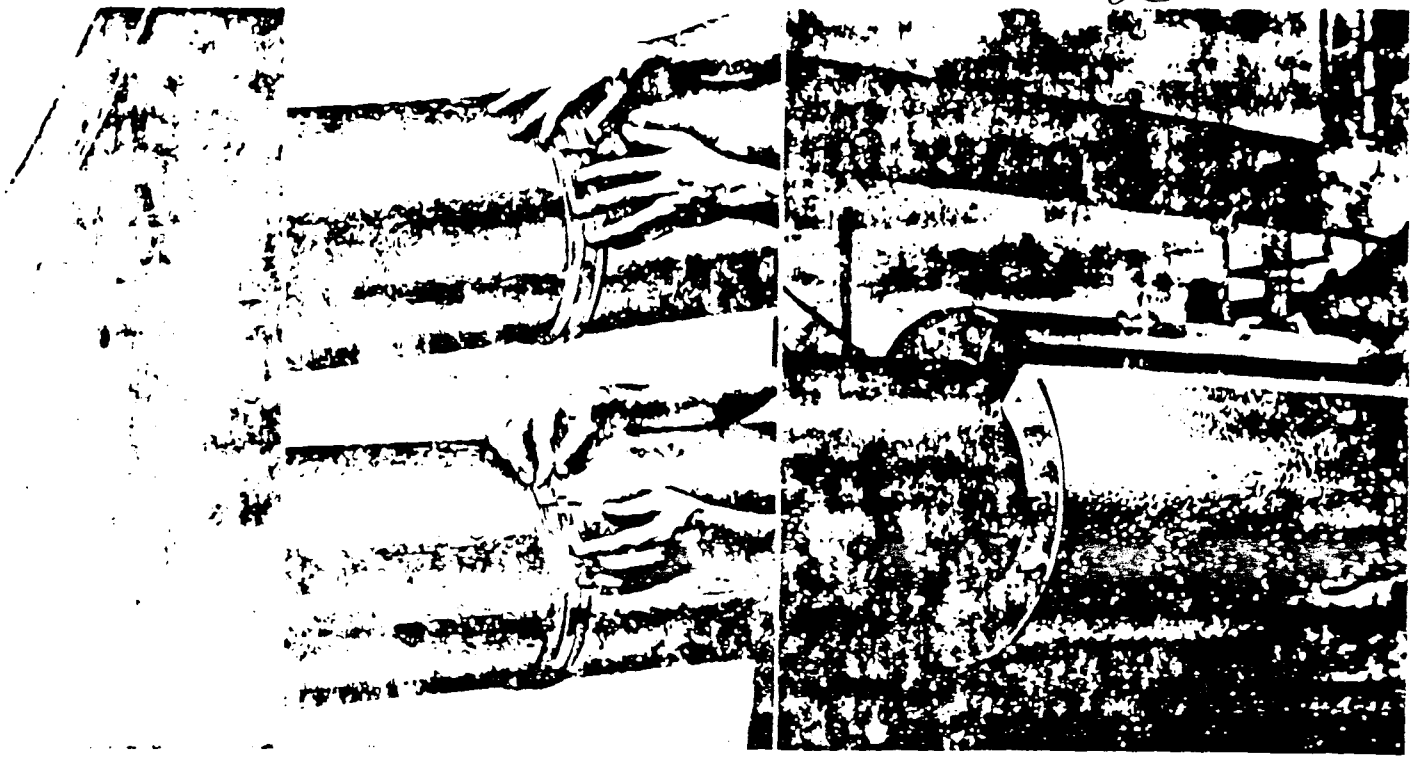
. . . the efficient, high-temperature insulation with a new embossed aluminum jacket

Quick, one-step application gives piping full weather protection while adding a distinctive, "No-Glare" appearanc

- A "DRESSED-UP" LINE
- "LOCKS OUT" THE WEATHER
- LESS MAINTENANCE
- RESISTANCE TO MECHANICAL DAMAGE
- "NO-GLARE" TEXTURE
- SELF-LOCKING JACKET
- ACCURATELY SIZED
- PERMANENT AND RE-USABLE
- EXCELLENT THERMAL EFFICIENCY
- ECONOMY WITH ONE-STEP APPLICATION



. . . All of these advantages are yours when you specify



"LOCKS OUT" THE WEATHER

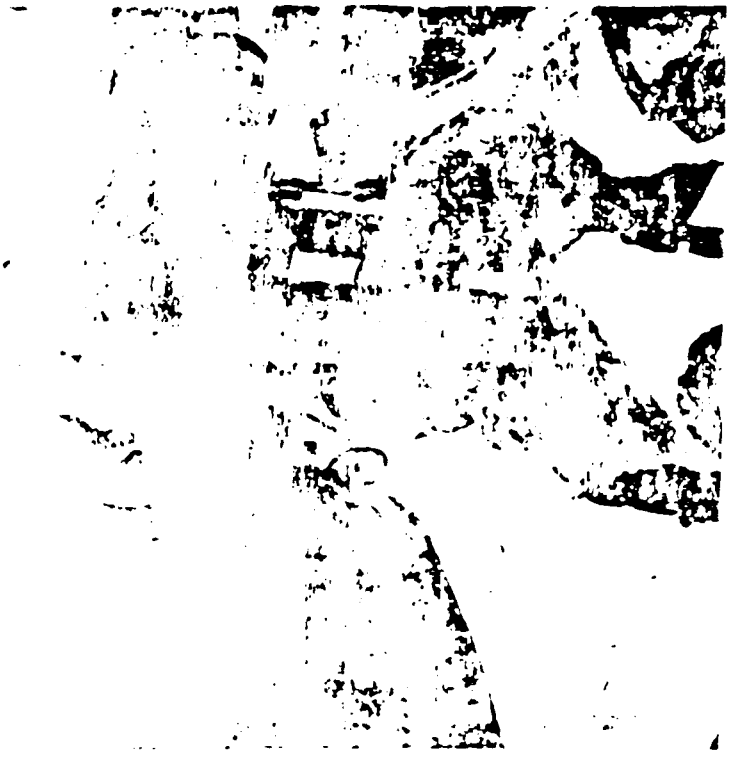
[illegible]nctive appearance afforded by Kaylo Klad, while out [illegible] all-important. Kaylo-Klad is "tough" in its thick [illegible] aluminum jacket. It provides greater resistance to me[illegible] damage. The longitudinal seam of jacket snaps to [illegible] with interlocking [illegible] which, when faced downward, assure weather tightness and maintenance free performance.

FAST INSTALLATION

The soft, rippled texture embossed in the aluminum jacket diffuses light and eliminates glare—at the same time "dressing up" a pipe line. Installation of jacket and insulation is a one step application—an important factor in the all around practicability of Kaylo Klad. Longitudinal seam has a self locking jo[illegible] joints are sealed with a band having an integral sealing compound which resists direct contact temperatures to 400°F.

KAYLO-KLAD

...BLE KAYLO IN NEW FACE. Kaylo has long been recognized for its efficient ... insulating high temperature industrial piping, and now Owens Corning ... factory jacketing Kaylo in embossed aluminum. The result: KAYLO KLAD.



KAYLO-KLAD

is a superior, all-purpose, high-temperature pipe insulation for piping in power, chemical, refining and other processing and industrial uses

...RICATES WITH SIMPLE TOOLS

A ... saw, for instance, is all that is necessary to ... Where power is unavailable, an ... do. A portable saber saw can be used to ... around pipe supports and hangers.

...aylo ... up to a long service life and a ... look for your industrial pipe insulation, while provid... thermal efficiency for temperatures up to 1200 F

AND WHAT'S UNDERNEATH THE ALUMINUM JACKET? . . .

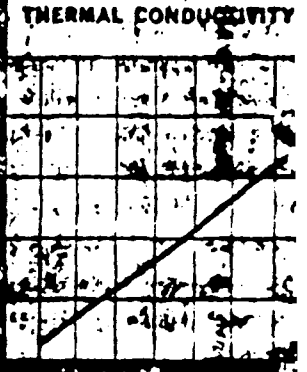
KAYLO-KLAD

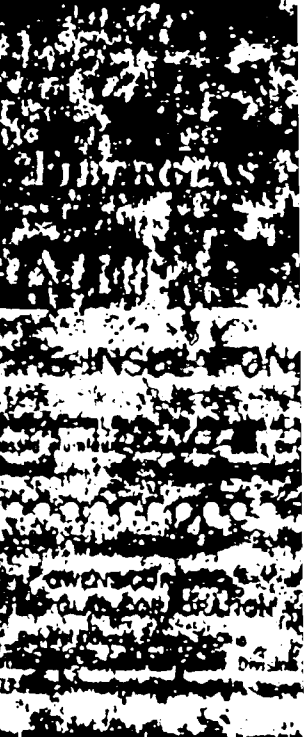
RECOMMENDED THICKNESSES OF KAYLO-KLAD

E—Insulation Efficiency ML—Heat Loss Btu/Lin. ft./hr. ST—Surface Temperature

400° F				500 F				600 F				1000 F				1200 F			
70° F				100 F				200 F				1000 F				1100 F			
RT	ML	E	ST	RT	ML	E	ST	RT	ML	E	ST	RT	ML	E	ST	RT	ML	E	ST
1½	148	91.5	119	2	112	97.4	124	2½	120	94.8	118	3	148	96.3	126
1½	155	90.3	120	2	125	93.2	125	2½	144	95.3	123	3	162	95.8	127
1½	167	91.4	125	2	136	94.9	127	2½	151	96	126	3	184	96.2	133
1½	179	92.5	127	2½	143	95	123	3	175	96.3	125	3½	210	97.1	129
2	166	93.9	113	3½	146	95.5	119	3	177	96.5	121	3½	199	97.8	127
2	177	94	121	3½	170	95.8	124	3	200	96.9	128	4	218	98.0	135
2	187	94.8	117	4	181	96.3	124	3	205	97.1	125	4	231	97.8	128
2	194	94.9	120	3	197	96.6	126	3½	230	97.8	126	4	247	97.9	130
2	202	95.8	125	3	277	97	124	3½	274	97.8	128	4½	288	98.3	127
2½	208	96.9	127	3	286	97.1	125	4	282	98.1	125	4½	305	98.3	130
2½	223	96.9	125	3½	294	97.5	122	4	282	98.5	129	5	344	98.9	128
2½	230	96	127	3½	297	97.6	125	4½	333	98.5	126	5	377	98.6	130
2½	237	96.2	127	3½	306	97.7	126	4½	366	98.5	125	5½	388	98.7	126
2½	313	96.3	128	3½	353	97.7	127	4½	400	98.5	128	5½	438	98.9	128
2½	343	96.3	125	3½	397	97.7	129	4½	440	98.5	130	6	482	98.9	127
2½	366	96.4	130	4	410	98	125	5	488	98.8	127	6	519	99.0	129
3	368	96.8	125	4	447	98	125	5	507	98.7	129	6	564	98.8	131
3	428	96.9	126	4½	496	98.1	126	5	563	98.8	128	6	621	98.9	132
3	488	97.1	125	4½	551	98.1	123	5½	545	98.8	127	6	679	99.0	134
3	535	96.9	128	4½	571	98.1	130	5½	605	98.8	128	6	733	99.1	135
3	610	97	128	4½	6	98.4	125	5½	685	98.8	129	6	841	99.1	137
1	108	86.4	107	1½	124	91.4	125	2	144	94.1	124	2	178	94.2	129
1½	143	94.3	126	1½	145	94.1	125	2	164	94.6	127	2½	175	95.5	134
1½	167	95.4	125	2	168	94.8	127	2½	174	95.4	124	2½	198	95.9	141
1½	179	95.4	127	2	180	94.9	125	2½	184	95.1	125	3	211	96.5	137
1½	195	95.4	132	2½	195	95.4	132	3	196	95.7	126	3	212	96.9	134
																3	250	97.1	140
																3	294	97.4	139
																3	316	97.5	137
1½	245	91.7	127	2	251	96.1	144	3	299	97.6	127	3½	335	97.9	140
1½	247	94.1	129	2	274	96.8	137	3	347	97.8	136	3½	386	98.0	145
2	270	94.4	131	2½	337	96.7	135	3	401	98	137	3½	430	98.2	147
2	302	95.1	131	2½	375	97.0	141	3½	386	98.3	135	3½	471	98.2	148
2	333	95.6	135	3	399	97.2	140	3½	474	98.2	137	4	474	98.4	142
2	362	95.9	136	3	435	97.2	142	3½	498	98.3	138	4	513	98.5	143
2	377	95.8	137	3	441	97.3	146	3½	504	98.3	141	4	543	98.5	144
2	401	95.9	138	3½	463	97.3	148	3½	526	98.3	143	4	642	98.5	148
2	515	95.7	143	3	541	97.5	145	3½	642	98.1	147	4½	647	98.7	144
2	529	95.8	144	3	556	97.6	147	4	643	98.5	145	4½	719	98.7	145
2	540	95.9	147	3	6	97.7	147	4	707	98.6	147	5	778	98.8	148
2	568	95.9	145	3	6	97.7	144	4	777	98.6	147	5	860	98.9	143
2½	601	96	146	3	640	97.7	147	4	841	98.6	144	5	922	98.9	141

...ation is on the basis of one inch or greater finish. Due to the low conductivity of energy-conserving Kaylo-Klad, ... those listed above. This surface temperature will vary with ambient ...





... detailed information ... our complete line of Fiberglas Industrial Insulations.

S-IN-153

Kaylo block insulation



Kaylo* Block Insulation is an off white, rigid hydrous calcium silicate heat insulation manufactured by Owens-Corning Fiberglas Corp., that effectively insulates indoor and outdoor equipment up to 1200° F.

A chemically reacted material, it contains asbestos fibers for reinforcement. Its insulating effectiveness results from countless tiny entrapped air pockets.

Kaylo's light weight, superior flexural strength and resistance to abrasion, are far above the normal requirements for heat insulation.

It comes in 3", 6", 12" and 18" widths and lengths from 18" to 36". Manufactured thicknesses are 1", 1½", 2", 2½", 3", 3½", and 4".

*Trademark Owens-Corning Fiberglas Corp.

FIBERGLAS

Kaylo 20 block insulation



This new calcium silicate block insulation manufactured by OCF extends the use of Kaylo* Equipment Insulation to include temperatures up to 1800° F.

It is slightly pink in color to be distinguished from standard Kaylo. Its characteristics are virtually the same as standard Kaylo except that it has a higher temperature range.

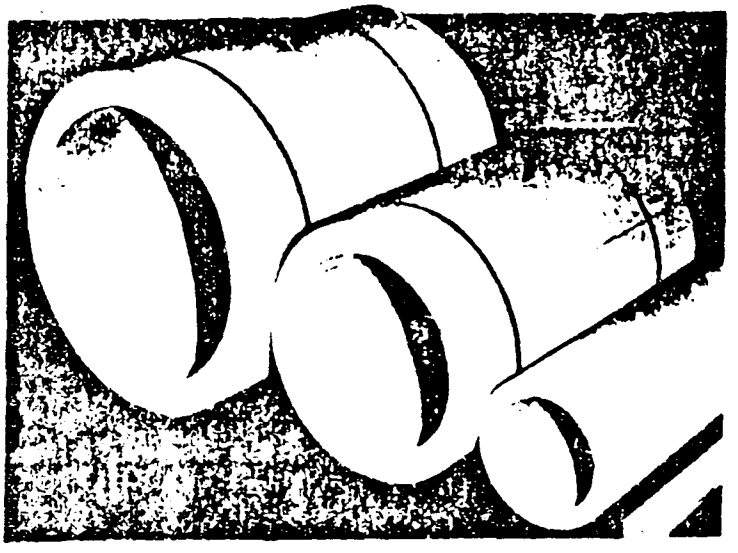
It is suitable for all high temperature applications including refractory wall backing for furnaces and boilers and fireproofing of equipment and vessel skirts.

It is made in thicknesses of 1", 1½", 2", 3", 3½", and 4", and widths of 3", 6", 12" and 18". Two lengths of 18" and 36". Curved block is available on special order.

*Trademark Owens-Corning Fiberglas Corp.

FIBERGLAS

Kaylo pipe insulation



Designed for indoor or outdoor piping up to 1200° F. It is made of hydrous calcium silicate by Owens-Corning Fiberglas and contains no added binder. A small amount of asbestos fiber is added at time of manufacture for mechanical effects.

This thoroughly tested and field-proven material contains the physical properties most desired for efficient, durable insulation work. Kaylo* is moisture resistant and retains an appreciable amount of strength even after complete saturation in water. Its original efficiency returning after drying.

It is made to fit pipes up to 29" and copper tubing to 3⅛" diameter. All insulation is furnished in 3' sections. This insulation is available in thicknesses from 1" to 3" depending upon pipe size, and for tubing in a thickness of 1" and 1½". Check thickness standard data sheet for exact sizing

JACKETS

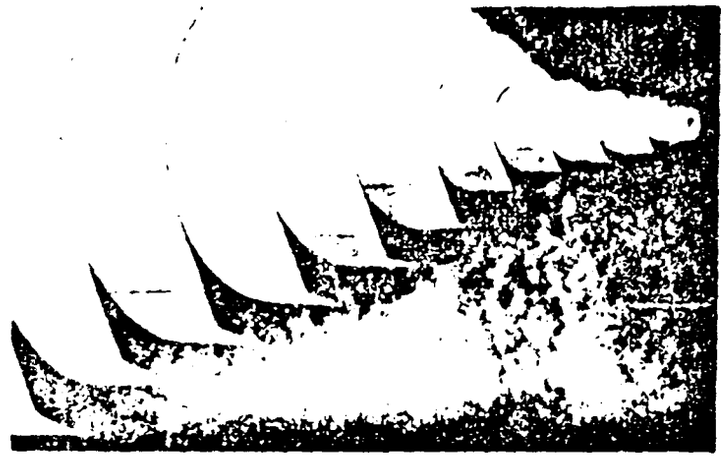
CANVAS. Standard canvas jackets at no additional charge on thickness up to and including 2½". 6 oz. and 8 oz. canvas jackets are available on all types, sizes and thicknesses at additional charge.

*Trademark Owens-Corning Fiberglas Corp.

Form No. 15 (N-1318 Litho in U.S.A., October, 1959

FIBERGLAS

Kaylo 20 pipe insulation



Specifically designed for indoor and outdoor piping with operating temperatures up to and including 1800° F.

It is colored pink for identification and made of calcium silicate by Owens-Corning Fiberglas. This insulation has moisture resistance and high strength of standard Kaylo* material. Being a high temperature insulation, it is also extremely useful as a fire-proofing material.

It fits all standard pipe to 30" and copper tubing to 3⅝" diameter. All insulation is furnished in 3' lengths. The insulation is available in thicknesses from 1" to 3" depending upon pipe size and for tubing in a thickness of 1" and 1½". Check thickness standard data sheet for exact sizing.

JACKETS

CANVAS. Standard canvas jacketing may be used for hot water or low pressure steam lines. A heavier canvas of 6 oz. or 8 oz. is also available at extra cost.

*Trademark Owens-Corning Fiberglas Corp.

A. I. A. FILE NO. 37-D-2

OWENS-CORNING

FIBERGLAS

PIPE & EQUIPMENT INSULATION

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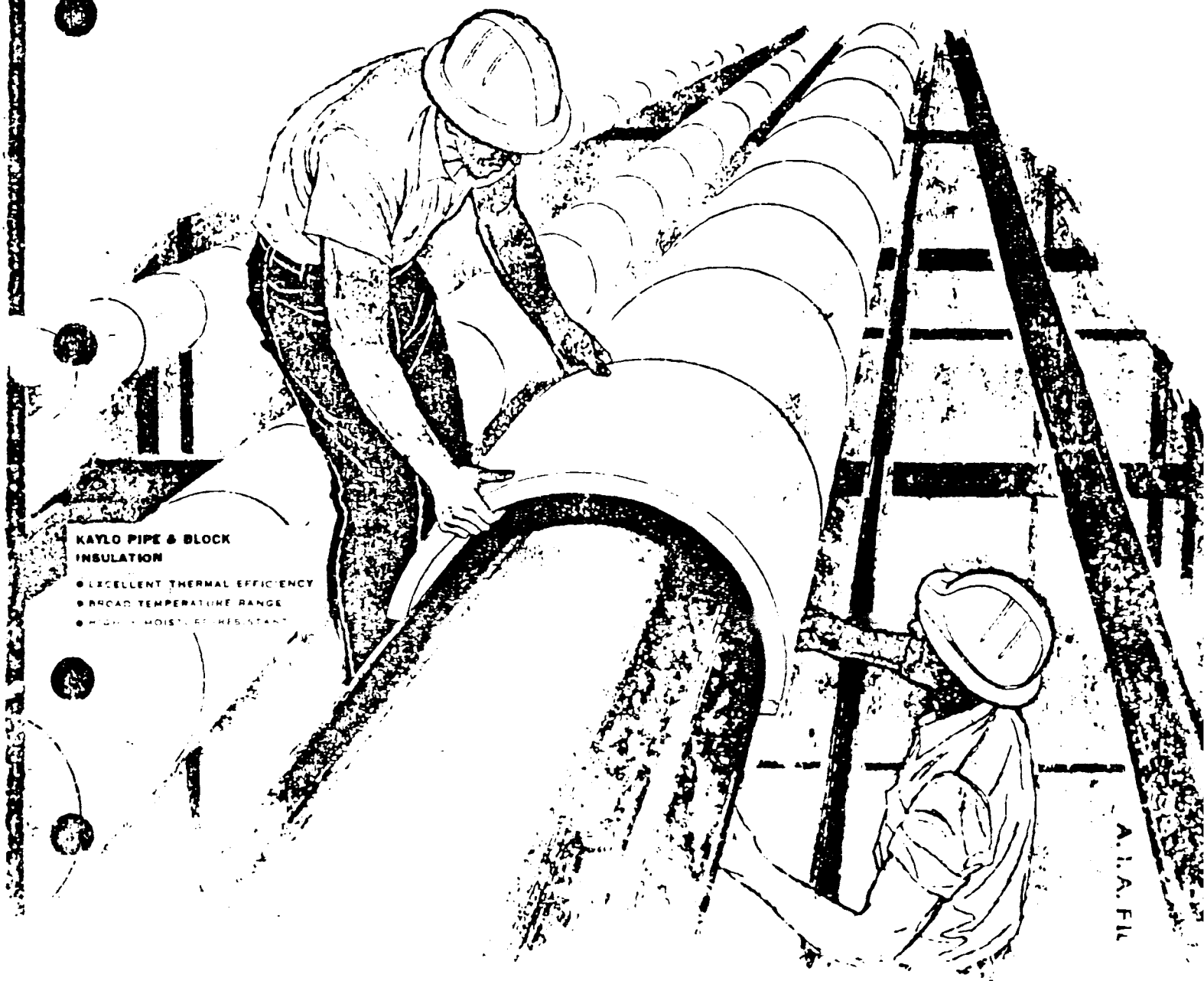
FOR HEATED INDOOR & OUTDOOR APPLICATIONS

KAYLO UP TO 1200° F.
KAYLO-20 UP TO 1800°



KAYLO PIPE & BLOCK INSULATION

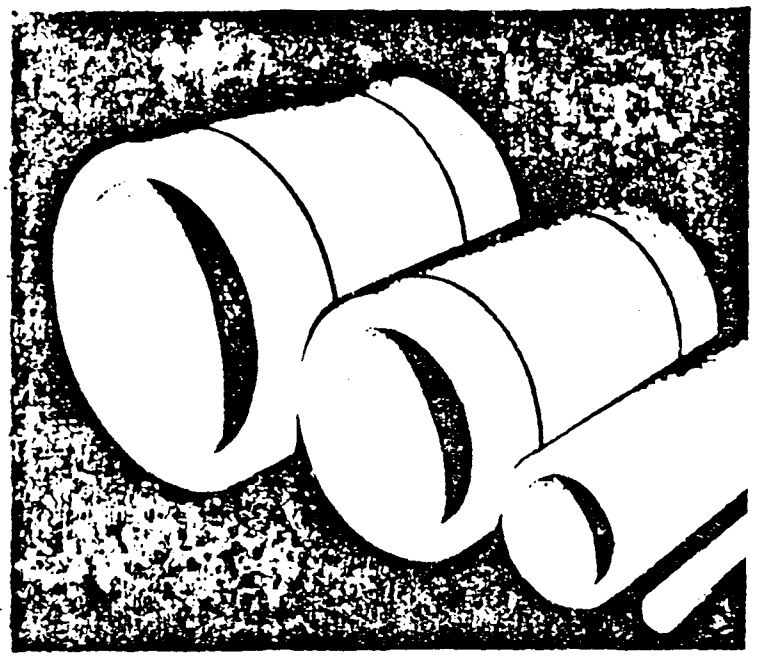
- EXCELLENT THERMAL EFFICIENCY
- BROAD TEMPERATURE RANGE
- HIGHLY MOISTURE RESISTANT

A. I. A. FIL

KAYLO insulation

note:

high temperature insulation for indoor or outdoor piping up to 1200° F. operating temperature





Kaylo Pipe Insulation presents a superior final appearance when applied to a variety of irregularly-shaped high temperature vessels.

(for temperatures ranging from 1200°F. to 1800°F., see Kaylo-20, page 6)

Kaylo* pipe insulation, a white, rigid hydrous calcium silicate heat insulation, manufactured by Owens-Corning Fiberglas Corporation, effectively insulates indoor and outdoor piping to 1200°F. A chemically reacted material, Kaylo pipe insulation contains no added binders. For mechanical effects, a small amount of asbestos fiber is included at the time of manufacture.

This thoroughly tested and field-proven material contains the physical properties most desired for efficient, durable insulation work. It retains an appreciable percentage of its strength even after complete saturation in water, original efficiency returning after drying. The effectiveness, high strength and moisture resistance are unattained by most other insulating materials.

sizes

thickness—Kaylo Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes—Kaylo Pipe Insulation is available to fit pipe from ½" to 39" in diameter. Kaylo Tube Insulation will fit copper tubing from ½" to 3⅛" in diameter.

forms—Kaylo Pipe Insulation is available in sectional or multisegmental form depending upon pipe size. All insulation is furnished in 3' sections.

jackets

canvas—Kaylo Sectional Pipe Insulation includes standard canvas jackets, at no additional charge, on thicknesses up to and including 2½". Standard canvas is available on segmental forms at a slight additional cost. Bands are available for use with this product at slight additional charge and will be furnished on request.

6 oz. and 8 oz. canvas jackets are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms, they are furnished but not adhered.

limitations

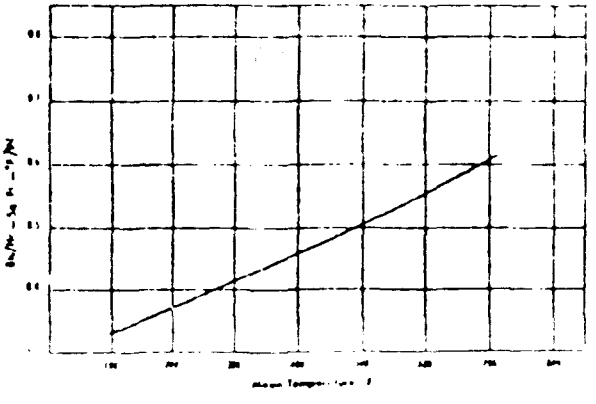
Kaylo Pipe Insulation is designed for temperatures up to 1200 F. and is not recommended when operating temperatures of piping exceed this limit.

*T. M. Owens Corning Fiberglas Corp.

physical properties

density	approximately 11 lb. per cu. ft.
flexural strength	50 lb. per sq. in.
compressive strength (at 5% deformation)	
before heating	150 lb. per sq. in.
after heating for 24 hours	
at 750°F.	144 lb. per sq. in.
at 1000°F.	123 lb. per sq. in.
at 1200°F.	117 lb. per sq. in.
after boiling for 24 hours (while wet)	74 lb. per sq. in.
resistance to abrasion	
(conventional tumbling test-loss in weight after 10 min.)	
before heating	2.2%
after heating for 24 hours	
at 750°F.	3.7%
at 1000°F.	5.7%
at 1200°F.	6.9%
dimensional stability	
linear shrinkage after heating for 24 hours	
at 750°F.	0.8%
at 1000°F.	0.9%
at 1200°F.	1.4%
elongation after saturation (max.)	0.04%
moisture adsorption (volume)	
after 6 hours exposure in atmosphere of 120°F. and 90% relative humidity	0.9%

thermal conductivity



ease of application



specifications

for insulation of piping with Kaylo and Kaylo-20 pipe insulation

specification compliance

HH-I-523a Insulation Block, Pipe Covering and Cement, Thermal, Calcium Silicate (For Temperatures up to 1200°F.)

MIL-I-2781B Insulation Pipe Covering, Thermal

1. Insulating materials

All heated pipes shall be insulated to the thickness noted on drawings or as shown in the table on page 6 as manufactured by Owens-Corning Fiberglas Corporation.

2. Application

All Pipe Insulation shall be applied over clean, dry surfaces, butting adjoining sections firmly together. Insulation on pipes under 12" diameter shall have factory-applied canvas pasted neatly in place.

Insulation on pipes over 12" diameter and all outdoor piping shall be wired in place with 16 gauge soft annealed wire on no greater than 9" centers. Where double layer insulation is applied, the first layer shall be wired in place without jacket; the second layer shall be applied with all joints staggered.

All flanges, valves and fittings shall be insulated with fabricated mitered segments of pipe insulation equal in thickness to the insulation on the adjoining pipes. Fittings on pipe size of 3" and smaller may be insulated with insulating cement of equal thickness.

3. Surface finish

Indoor piping under 12" diameter not subject to abrasion or mechanical abuse requires no finish in addition to the factory-furnished canvas. Piping over 12" diameter shall be finished with 6-ounce canvas pasted in place.

Piping located outdoors shall be finished with 4 lb. roofing felt jacket with all joints lapped not less than 2". Jackets shall be wired with 16 ga. copper wire on not greater than 9" centers or banded on 12" centers with ½" galvanized bands. Other suitable weatherproof jackets such as metal, asphalt or plastic coating may be applied according to the jacket manufacturers' specifications.

Insulation on flanges, valves and fittings shall be covered with a ¼" coat of finishing cement. Portland cement to a maximum of 25% dry weight may be added if a harder finish is desired. Insulation located indoors shall be further finished with canvas neatly pasted in place.

All insulation on flanges, valves and fittings located outdoors shall be covered with asphalt weatherproof mastic reinforced with an open mesh glass fabric. Mastic shall be applied in sufficient thickness to give a ⅛" dry coat and shall be troweled neatly over the fitting with the jacket on the adjacent pipe insulation lapped at least 2" over the mastic.

The above specifications are necessarily general in nature. Application procedure is at the discretion and responsibility of the design engineer to meet specific requirements.

design data

The following data is presented to aid in the design of Kaylo Pipe Insulation modified to meet specific needs. Recommendations are generalized and should be modified to meet local conditions and job requirements.

This table presents reference data for information on the actual thicknesses according to the simplified Dimensional Standard system.

Kaylo pipe insulation applies easily and quickly with standard application methods. Ordinary tools of the trade are sufficient for all cutting, sawing or scoring. It is non-irritating to the skin and non-toxic.

Economical thicknesses of insulation vary to a substantial degree in different industries principally because of:

1. Cost of fuel operation time
2. Fixed charges or anticipated life of installation

Economical Thickness recommendations may not apply where insulation is applied for process temperature control, personnel protection or fire protection for specific areas. Refer to Kaylo Performance Data Book for insulation design for such conditions.

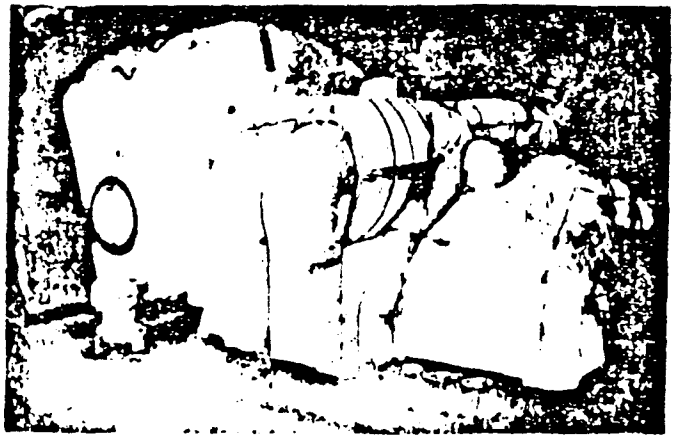
Because these two factors vary greatly by industry, a single table of recommended thickness would be only an approximation. To approach more closely a true "Economical Thickness," the recommended thickness data on the following three pages is presented for three major industry groups:

- **C** — Commercial and Industrial
- **U** — Power and Utility
- **P** — Process Industries

applications—Kaylo and Kaylo-20



Off-site yard steam insulated with Kaylo Pipe Insulation for efficiency controlled temperatures at distant points



Kaylo 20 Insulation being used on the head of a high pressure turbo generator.



Kaylo Pipe Insulation application on high pressure steam piping central station generating facilities.



recommended thicknesses—Kaylo

(ambient still air at 80°F.)

pipe temp.	280°F				480°F				680°F			
temp. diff.	200°F				400°F				600°F			
pipe size	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST
½	1	28.6	79.0	100	1½	52.5	86.7	107	2	77.0	90.6	110
¾	1	34.2	79.5	104	1½	60.0	87.6	110	2½	74.4	92.7	103
1	1	35.9	82.6	101	1½	65.3	89.0	109	2½	85.9	93.1	106
1¼	1	45.8	82.0	108	1½	73.2	90.1	110	2½	98.3	93.7	109
1½	1	46.3	84.0	104	2	65.8	92.2	103	3	89.0	95.0	102
2	1	53.5	84.9	105	2	80.3	92.8	107	3	108	95.1	108
2½	1	61.5	85.5	106	2	83.7	93.3	105	3	115	96.1	107
3	1	72.7	85.7	108	2½	90.8	93.9	104	3½	124	96.1	107
4	1	86.4	86.5	108	2½	107	94.4	105	3½	146	96.4	108
5	1	106	86.5	110	2½	126	94.6	107	3½	164	96.7	110
6	1½	94.2	90.0	103	2½	143	94.8	109	4	170	97.1	107
7	1½	102	90.3	103	2½	162	94.8	109	4	190	97.2	108
8	1½	114	90.4	104	2½	174	95.0	110	4	210	97.2	109
9	1½	125	90.4	104	2½	188	95.2	110	4	222	97.4	110
10	1½	133	90.8	104	3	179	95.9	106	4½	226	97.6	108
12	1½	153	91.0	104	3	210	95.9	107	4½	250	97.7	109
14	1½	178	90.4	106	3	235	95.8	108	4½	275	97.7	109
16	1½	201	90.4	107	3	255	95.9	109	5	286	97.9	108
18	1½	223	90.5	108	3	285	96.0	110	5	320	97.9	109
20	1½	246	90.5	108	3½	272	96.5	108	5	353	97.9	110
24	1½	291	90.5	108	3½	319	96.6	107	5½	364	98.2	108

KEY

RT— Recommended Thickness.

HL— Heat Loss Btu/Lin. ft./hr.

E— Insulation Efficiency.

ST— Surface Temperature.

pipe temp	280°F				480°F				680°F				880°F				1080°F				1280°F			
temp. diff.	200°F				400°F				600°F				800°F				1000°F				1200°F			
pipe size	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST
½	1	28.6	79.0	100	1	63.0	84.0	120	1½	86.0	89.5	119	2	112	92.4	124	2½	128	94.8	118	2½	162	95.6	1[illegible]
¾	1	34.2	79.5	104	1	75.2	84.4	128	1½	98.3	90.3	126	2	125	93.2	128	2½	144	95.3	122	3	171	96.[illegible]	[illegible]24
1	1	35.9	82.6	101	1	79.2	86.7	123	1½	107	91.4	125	2	136	94.0	127	3	151	96	120	3	194	95.8	29
1¼	1	45.8	82.0	108	1½	73.2	90.1	110	1½	120	92.3	127	2½	143	95	123	3	175	96.3	125	3½	207	97.3	129
1½	1	46.3	84.0	104	1½	82.1	90.2	114	2	108	93.9	113	2½	146	95.5	119	3	177	96.8	122	3½	206	97.8	121
2	1	53.5	84.9	105	1½	93.5	91.0	114	2	132	94.	121	2½	170	95.8	126	3	208	96.9	130	4	228	97.9	125
2½	1	61.5	85.5	106	1½	96.1	92.3	111	2	137	94.8	117	2½	181	96.3	124	3	206	97.5	129	4	240	98.1	127
3	1	72.7	85.7	108	1½	126	91.5	120	2	164	94.9	128	3	197	96.6	124	3½	236	97.6	126	4	282	98.7	130
4	1	86.4	86.5	108	1½	154	91.9	123	2	202	95.0	128	3	222	97	124	3½	274	97.8	130	4½	300	98.5	126
5	1	106	86.5	110	1½	177	92.4	123	2½	206	95.9	122	3	266	97.1	128	4	292	98.1	125	4½	345	98.6	130
6	1	137	85.1	116	1½	207	92.4	126	2½	239	95.9	125	3½	268	97.5	122	4	332	98.5	129	5	370	98.7	129
7	1½	102	90.3	102	1½	224	92.8	125	2½	270	96	127	3½	297	97.6	125	4½	333	98.5	124	5	394	98.8	129
8	1½	114	90.4	103	1½	249	92.9	127	2½	287	95.2	127	3½	326	97.7	126	4½	366	98.5	125	5½	400	98.9	127
9	1½	125	90.4	108	1½	273	93.0	128	2½	313	96.3	128	3½	353	97.7	127	4½	400	98.5	128	5½	450	99.[illegible]	129
10	1½	133	90.8	103	1½	292	93.2	127	2½	348	96.3	129	3½	392	97.7	129	4½	440	98.5	130	6	461	99.[illegible]	28
12	1½	153	91.0	108	1½	328	93.7	128	2½	395	96.4	130	4	410	98	125	5	460	98.8	127	6	502	99.[illegible]	[illegible]
14	1½	178	90.4	106	2	325	94.1	123	3	385	96.8	125	4	447	98	128	5	500	98.7	129	6	568	99.[illegible]	133
16	1½	201	90.4	107	2	375	94.0	124	3	428	96.9	126	4	495	98.1	128	5	563	98.7	130	6	636	99.[illegible]	134
18	1½	223	90.5	108	2	410	94.2	125	3	480	96.9	127	4	540	98.1	129	5½	545	98.8	127	6	685	99.1	135
20	1½	246	90.5	108	2	460	98.4	126	3	535	96.9	128	4	594	98.1	130	5½	605	98.9	128	6	749	99.[illegible]	137
24	1½	291	90.5	108	2	525	94.3	126	3	610	97	128	4½	618	98.4	126	5½	685	98.9	129	6	856	99.2	138
½	1	28.6	79.0	100	1	63.0	84.0	120	1½	108	86.8	147	1½	124	91.6	136	2	146	94.1	134	2	189	95.[illegible]	147
¾	1	34.2	79.5	104	1	75.2	84.4	128	1½	98.2	90.3	126	1½	145	92.1	145	2	166	94.6	141	2½	181	96.2	133
1	1	35.9	82.6	101	1	79.2	86.7	123	1½	107	91.4	125	2	136	94.0	127	2½	174	95.4	134	2½	208	96.5	135
1¼	1	45.8	82.0	108	1	107	86.3	134	1½	120	92.3	127	2	160	94.4	135	2½	188	96.1	135	3	218	97.1	136
1½	1	46.3	84.0	104	1	102	87.8	129	1½	135	92.4	132	2	156	95.2	126	2½	207	96.2	142	3	240	97.2	142
2	1	53.5	84.9	105	1	118	88.6	131	1½	154	93.0	134	2	189	95.3	135	2½	223	96.7	138	3	258	97.6	139
2½	1	61.5	85.5	106	1	135	89.1	134	1½	158	94.0	137	2	200	96.4	132	2½	237	97.1	134	3	276	97.9	137
3	1	72.7	85.7	108	1	160	89.3	137	1½	202	93.7	140	2	250	95.7	145	2½	292	97.0	147	3	332	97.9	148
4	1	86.4	86.5	108	1	191	89.9	138	1½	249	92.7	147	2	293	96.1	148	3	299	97.6	137	3½	347	98.3	140
5	1	106	86.5	110	1	240	89.6	144	1½	297	94.0	149	2½	294	96.8	137	3	347	97.8	140	3½	409	98.5	143
6	1	137	85.1	116	1½	207	92.4	126	2	270	95.4	133	2½	337	96.9	139	3	403	98	147	3½	453	98.5	147
7	1½	102	90.3	102	1½	224	92.8	125	2	307	95.5	134	2½	373	97.0	141	3½	386	98.3	135	3½	496	98.5	149
8	1½	114	90.4	103	1½	249	92.9	127	2	332	95.6	135	2½	399	97.2	140	3½	422	98.2	137	4	442	98.7	142
9	1½	125	90.4	108	1½	273	93.0	128	2	349	95.9	136	2½	435	97.2	142	3½	458	98.3	138	4	533	98.7	143
10	1½	133	90.8	104	1½	292	93.2	127	2	366	95.8	137	2½	442	97.2	146	3½	504	98.3	140	4	596	99.[illegible]	141
12	1½	153	91.0	104	1½	328	93.7	128	2	414	95.9	138	2½	503	97.3	148	3½	575	98.3	143	4	680	98.5	145
14	1½	178	90.4	106	1½	368	93.9	132	2	462	95.7	143	3	541	97.6	140	3½	642	98.3	147	4	671	98.[illegible]	[illegible]
16	1½	[illegible]	90.4	107	1½	411	93.8	133	2	526	95.8	144	3	606	97.6	141	4	642	98.5	140	4½	762	98.[illegible]	[illegible]
18	1½	[illegible]	90.5	108	1½	450	94.0	134	2	640	95.9	147	3	671	97.7	142	4	707	98.6	142	5	736	99	[illegible]
20	1½	246	90.5	108	2	540	98.1	134	3	588	96.1	135	3	735	97.7	144	4	777	98.6	142	5	821	99	[illegible]
24	1½	291	90.5	108	2	64	98.1	135	3	690	96.1	[illegible]	3	870	97.7	147	4	903	98.6	144	5	955	99.[illegible]	[illegible]

FIBERGLAS

KAYLO-20 insulation



note:

high temperature insulation and fireproofing for indoor and outdoor piping up to 1800° F. operating temperature

Kaylo® 20 insulation, a new high-temperature calcium silicate heat insulator developed and manufactured by Owens-Corning Fiberglas extends the range of Kaylo heat insulation to include temperatures up to 1800° F. with all the properties of moisture resistance and high strength of standard Kaylo material. It also may be used with outer layers of Fiberglas pipe insulation to provide ultimate balance of cost and efficiency.

Kaylo-20 insulation is highly dimensionally stable at the temperatures for which it is designed. Resistance of this insulation to high temperatures makes it extremely useful for fireproofing piping.

sizes

thickness--Kaylo-20 Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo-20 Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes- Kaylo-20 Pipe Insulation is available to fit pipe from ½" to 39" in diameter. Kaylo-20 Tube insulation in copper tubing sizes will fit tubing from ½" to 3⅛".

forms--Kaylo-20 Pipe Insulation is available in sectional or multi-segmental form depending upon pipe size. All insulation is furnished in 3' sections.

jackets

canvas--Standard canvas jackets are provided at no additional charge with Kaylo-20 Sectional Pipe and Tube Insulation on thicknesses up to and including 2½". Bands are available for use with this product at a small additional charge and will be shipped only on request.

6 oz. and 8 oz. canvas jackets are available on all types, sizes and thicknesses of Kaylo-20 Pipe Insulation at additional charge. These jackets are factory applied on sectional pipe and tube insulation. On multi-segmental insulation, they are furnished but not adhered.

limitations

Kaylo-20 material is designed for temperatures up to 1800° F. It should not be used when operating temperatures will continuously exceed this limit.

Kaylo-20 insulations are presently available on a made-to-order basis only. Properties and characteristics were determined from laboratory tests only. Data is subject to change without notice and is subject to normal manufacturing testing tolerances.

™ Trademarks Corning Fiberglas Corp.

physical properties

density:
approximately 12 lbs. per cu. ft.

flexural strength:
50 lbs. per sq. in.

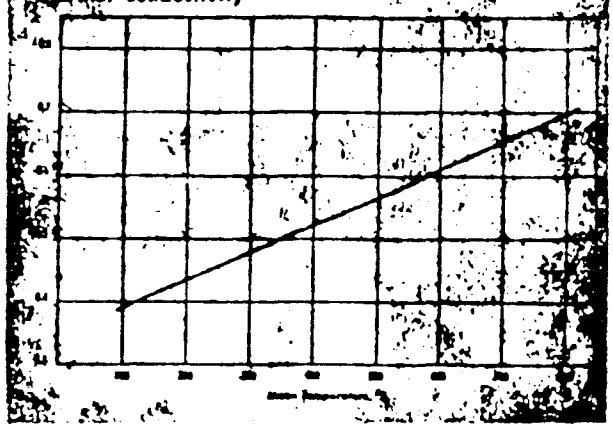
compressive strength:
100 lbs. per sq. in. at 5% deformation

dimensional stability:
linear shrinkage after heating for 24 hours:
at 1200° ..... less than 0.2%
at 1800° ..... less than 1.6%

moisture adsorption (by volume):
(after 6 hours exposure in atmosphere of 120° F. and 90% relative humidity) 0.9%

working temperatures: up to 1800° F.

thermal conductivity



recommended thicknesses

These are average figures and may be adjusted to meet special conditions encountered on specific jobs. Kaylo heat loss data is available for use where plant operating economics and other conditions demand greater insulation thicknesses.

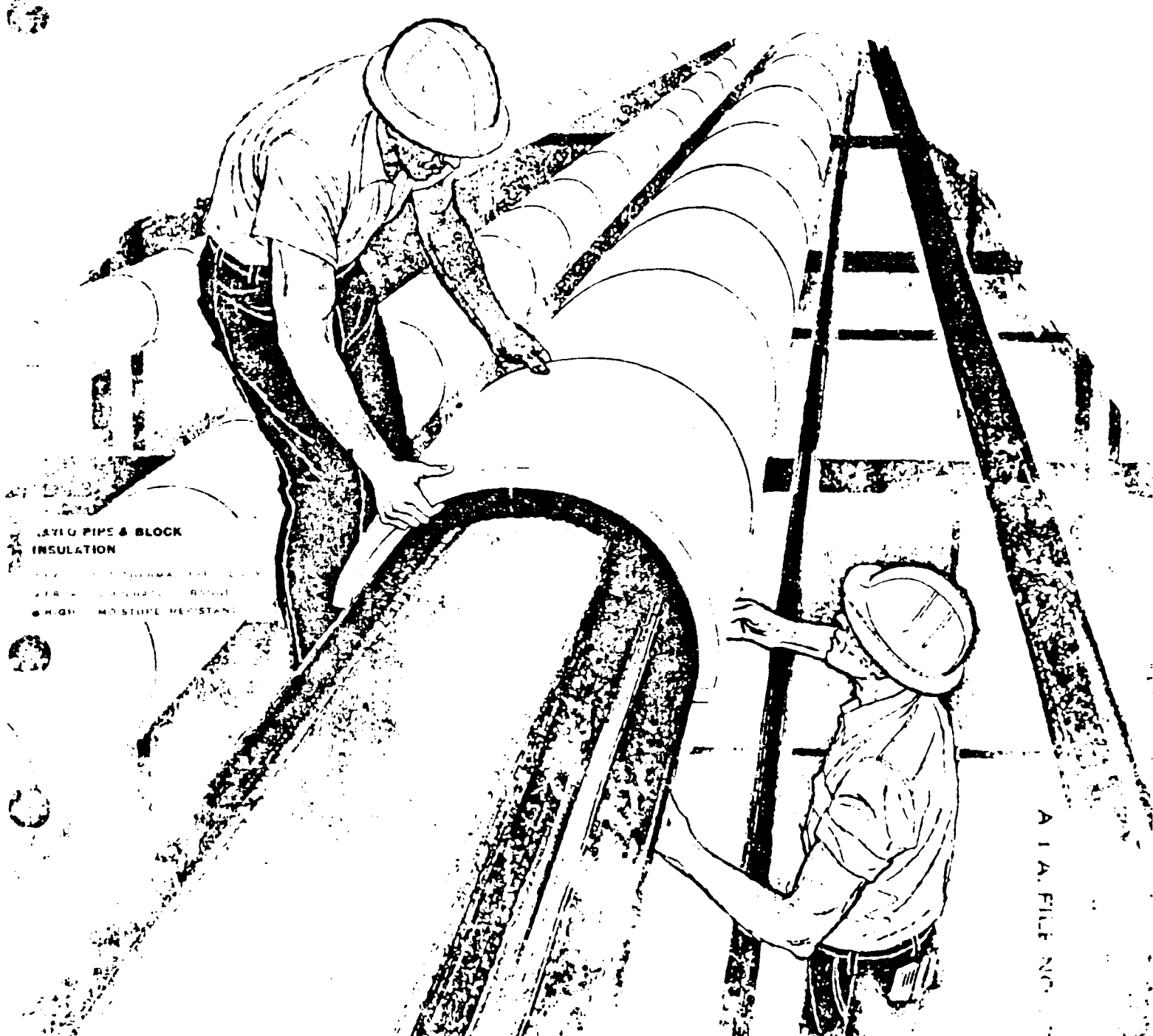
	Temperature Difference °F							
	1100	1200	1300	1400	1500	1600	1700	1800
	2½	2½	3	3	3½	3½	4	4
	2½	2½	3	3	3½	3½	4	4
	2½	3	3	3	3½	3½	4	4½
	2½	3	3	3½	3½	4	4½	4½
	3	3	3½	3½	3½	4	4½	5
	3	3	3½	3½	4	4	4½	5
	3	3½	3½	4	4	4½	5	5½
	3½	3½	3½	4	4	4½	5	5½
	3½	3½	4	4	4½	5	5½	6
	3½	3½	4	4	4½	5	5½	6
6	4	4	4½	4½	5	5½	6	6½
8	4	4	4½	4½	5	5½	6	6½
10	4	4½	4½	5	5½	6	6½	7
12	4½	4½	5	5	6	6	6½	7
14	4½	5	5	5½	6	6½	7	7½
16	4½	5	5½	6	6	6½	7½	8
18	5	5	5½	6	6½	7	7½	8
20	5	5½	6	6½	7	7½	8	8½
24-72	5	5½	6	6½	7	7½	8	8½

A. I. A. FILE NO. 37-D-2

OWENS-CORNING FIBERGLAS

KAYLO PIPE & EQUIPMENT INSULATION

- FOR HEATED INDOOR & OUTDOOR APPLICATIONS { KAYLO UP TO 1200° F. / KAYLO-20 UP TO 1800° F.



A. I. A. FILE NO.



insulation thickness standards—Kaylo and Kaylo-20

KEY

IP — iron pipe sizes

CT — copper tubing

			single layer only				single or double layer						multiple layer only							
			nom. 1"		nom. 1½"		nom. 2"		nom. 2½"		nom. 3"		nom. 3½"		nom. 4"		nom. 4½"		nom. 5	
			actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.
	⅛"	.84	1.00	2.88	1.56	4.00	2.06	5.00	2.89	6.66	3.39	7.66								
	¼"	1.06	.90	2.88	1.46	4.00	1.96	5.00	2.79	6.66	3.29	7.66								
	⅜"	1.32	1.08	3.50	1.58	4.50	2.11	5.56	2.66	6.66	3.16	7.66								
	½"	1.66	.90	3.50	1.66	5.00	1.94	5.56	2.48	6.66	2.98	7.66								
	¾"	1.90	1.03	4.00	1.53	5.00	2.36	6.66	2.86	7.66	3.36	8.86								
	2"	2.38	1.04	4.50	1.57	5.56	2.12	6.66	2.62	7.66	3.12	8.66	3.62	9.66	4.18	10.78	4.68	11.78	5.2	12.8
	2½"	2.88	1.04	5.00	1.67	6.66	2.37	7.66	2.87	8.66	3.37	9.66	3.93	10.78	4.43	11.78	4.95	12.81	5.5	14.0
	3"	3.50	1.09	5.56	1.55	6.66	2.05	7.66	2.55	8.66	3.05	9.66	3.61	10.78	4.11	11.78	4.63	12.81	5.2	14.0
	3½"	4.00	1.30	6.66	1.80	7.66	2.30	8.66	2.80	9.66	3.36	10.78	3.86	11.78	4.38	12.81	5.00	14.06	5.5	15.0
	4"	4.50	1.05	6.66	1.5	7.66	2.05	8.66	2.55	9.66	3.11	10.78	3.61	11.78	4.13	12.81	4.75	14.06	5.25	15.0
	4½"	5.00	1.30	7.66	1.8	8.66	2.30	9.66	2.86	10.78	3.36	11.78	3.88	12.81	4.50	14.06	5.00	15.06	5.5	16.0
	5"	5.56	1.02	7.66	1.52	8.66	2.02	9.66	2.58	10.78	3.08	11.78	3.59	12.81	4.22	14.06	4.72	15.06	5.25	16.0
	6"	6.63	.95	8.66	1.45	9.66	2.02	10.78	2.52	11.78	3.03	12.81	3.66	14.06	4.16	15.06	4.68	16.09	5.19	17.0
	7"	7.63			1.52	10.78	2.02	11.78	2.53	12.81	3.16	14.06	3.66	15.06	4.17	16.09	4.63	17.00	5.2	18.0
	8"	8.63			1.52	11.78	2.03	12.81	2.66	14.06	3.16	15.06	3.67	16.09	4.13	17.00	4.63	18.00	5.2	19.0
	9"	9.63			1.59	12.81	2.16	14.06	2.66	15.06	3.17	16.09	3.63	17.00	4.13	18.00	4.63	19.00	5.17	20.0
	10"	10.75			1.59	14.06	2.09	15.06	2.61	16.09	3.06	17.00	3.56	18.00	4.06	19.00	4.56	20.00	5.08	21.0
	11"	11.75			1.58	15.06	2.09	16.09	2.55	17.00	3.05	18.00	3.55	19.00	4.05	20.00	4.54	21.00	5.07	22.0
	12"	12.75			1.59	16.09	2.05	17.00	2.55	18.00	3.05	19.00	3.55	20.00	4.05	21.00	4.54	22.00	4.75	23.0
	14"	14.00			1.42	17.00	1.92	18.00	2.41	19.00	2.92	20.00	3.42	21.00	3.92	22.00	4.42	23.00	4.92	24.0
IP	15"	15.00			1.42	18.00	1.92	19.00	2.41	20.00	2.92	21.00	3.42	22.00	3.92	23.00	4.41	24.00	4.92	25.0
	16"	16.00			1.41	19.00	1.91	20.00	2.41	21.00	2.91	22.00	3.41	23.00	3.91	24.00	4.41	25.00	4.9	26.0
	17"	17.00			1.41	20.00	1.91	21.00	2.41	22.00	2.91	23.00	3.41	24.00	3.91	25.00	4.41	26.00	4.9	27.0
	18"	18.00			1.41	21.00	1.91	22.00	2.41	23.00	2.91	24.00	3.41	25.00	3.91	26.00	4.41	27.00	4.9	28.0
	19"	19.00			1.41	22.00	1.91	23.00	2.41	24.00	2.91	25.00	3.41	26.00	3.91	27.00	4.41	28.00	4.9	29.0
	20"	20.00			1.41	23.00	1.91	24.00	2.41	25.00	2.91	26.00	3.41	27.00	3.91	28.00	4.41	29.00	4.9	30.0
	21"	21.00			1.41	24.00	1.91	25.00	2.4	26.00	2.91	27.00	3.41	28.00	3.89	29.00	4.41	30.00	4.9	31.0
	22"	22.00			1.41	25.00	1.91	26.00	2.41	27.00	2.91	28.00	3.39	29.00	3.89	30.00	4.41	31.00	4.9	32.0
	23"	23.00			1.41	26.00	1.91	27.00	2.41	28.00	2.91	29.00	3.39	30.00	3.89	31.00	4.41	32.00	4.9	33.0
Quad. Seg.	24"	24.00			1.41	27.00	1.91	28.00	2.41	29.00	2.91	30.00	3.39	31.00	3.89	32.00	4.41	33.00	5.00	34.0
	25"	25.00			1.46	28.00	1.98	29.00	2.50	30.00	3.02	31.00	3.44	32.00	3.96	33.00	4.48	34.00	5.00	35.0
	26"	26.00			1.46	29.00	1.98	30.00	2.50	31.00	3.02	32.00	3.44	33.00	3.96	34.00	4.48	35.00	5.00	36.0
	27"	27.00			1.46	30.00	1.98	31.00	2.50	32.00	3.02	33.00	3.44	34.00	3.96	35.00	4.48	36.00	5.00	37.0
	28"	28.00			1.46	31.00	1.98	32.00	2.50	33.00	3.02	34.00	3.44	35.00	3.96	36.00	4.48	37.00	5.00	38.0
	29"	29.00			1.46	32.00	1.98	33.00	2.50	34.00	3.02	35.00	3.44	36.00	3.96	37.00	4.48	38.00	5.00	39.0
	30"	30.00			1.46	33.00	1.98	34.00	2.50	35.00	3.02	36.00	3.44	37.00	3.96	38.00	4.48	39.00	5.00	40.00
	31"	31.00			1.46	34.00	1.98	35.00	2.50	36.00	3.02	37.00	3.44	38.00	3.96	39.00	4.48	40.00	5.00	41.00
	32"	32.00			1.46	35.00	1.98	36.00	2.50	37.00	3.02	38.00	3.44	39.00	3.98	40.00	4.48	41.00	5.00	42.00
	33"	33.00			1.46	36.00	1.98	37.00	2.50	38.00	3.02	39.00	3.48	40.00	3.98	41.00	4.48	42.00	5.00	43.00
	34"	34.00			1.46	37.00	1.98	38.00	2.50	39.00	3.02	40.00	3.48	41.00	3.98	42.00	4.48	43.00	5.00	44.00
	35"	35.00			1.46	38.00	1.98	39.00	2.50	40.00	3.02	41.00	3.48	42.00	3.98	43.00	4.48	44.00	5.00	45.00
	36"	36.00			1.46	39.00	1.98	40.00	2.50	41.00	3.02	42.00	3.48	43.00	3.98	44.00	4.48	45.00	5.00	46.00
	37"	37.00			1.46	40.00	1.98	41.00	2.50	42.00	3.02	43.00	3.48	44.00	3.98	45.00	4.48	46.00	5.00	47.00
	38"	38.00			1.46	41.00	1.98	42.00	2.50	43.00	3.02	44.00	3.48	45.00	3.98	46.00	4.48	47.00	5.0	48.00
	39"	39.00			1.46	42.00	1.98	43.00	2.50	44.00	3.02	45.00	3.48	46.00	3.98	47.00	4.48	48.00	5.0	49.00

			single layer			
			nom. 1"		nom. 1½"	
			actual	O.D.	actual	O.D.
	⅛"	⅛"	1.18	2.88	1.49	3.50
	¼"	¼"	1.11	2.88	1.43	3.50
	⅜"	⅜"	1.05	2.88	1.61	4.00
	½"	½"	.99	2.88	1.55	4.00
CT	¾"	¾"	1.24	3.50	1.68	4.50
	1"	1"	1.24	3.50	1.68	4.50
	1¼"	1¼"			1.4	4.0
	1½"	1½"			1.31	5.00
	2"	2"	.91		1.31	5.5
	2½"	2½"	.91		1.31	5.5
	3"	3⅛"	.91		1.73	

Note: Sizes above 3" available in multiple layers.

Insulation for the nominal pipe size range of 25"-30" is furnished to fit a range of 5 pipe sizes. The last segment applied must be cut to fit accurately.



branch offices . . .

Fiberglas Industrial Contractors who sell and [illegible] Fiberglas Industrial Insulations are located in principal cities. Call your Fiberglas branch for their [illegible] or see the yellow pages of the telephone directory.

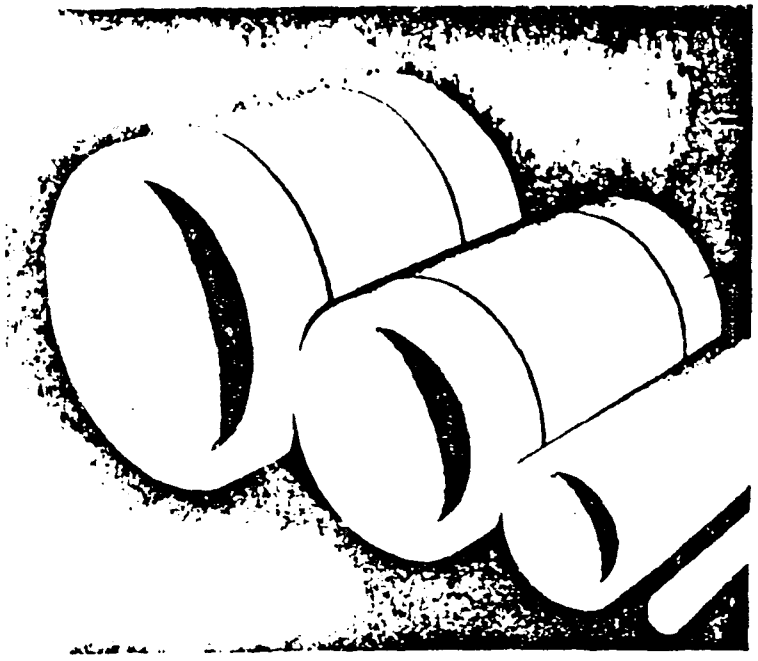
ALASKA	Anchorage [illegible]
ARIZONA	[illegible]
CALIFORNIA	[illegible]
[illegible]	[illegible]
FLORIDA	[illegible]
GEORGIA	[illegible]
IDAHO	[illegible]
ILLINOIS	[illegible]
INDIANA	[illegible] 320 [illegible]
	[illegible] 4, [illegible]
IOWA	[illegible]
KANSAS	[illegible]
KENTUCKY	[illegible] 2, 2106 [illegible]
LOUISIANA	New Orleans 19, [illegible]
MARYLAND	[illegible]
MASSACHUSETTS	[illegible]
MICHIGAN	[illegible]
MINNESOTA	[illegible]
MISSOURI	[illegible]
NEBRASKA	Omaha [illegible]
NEW MEXICO	[illegible]
NEW YORK	[illegible] Loudon [illegible] Rensselaer [illegible]
	[illegible] 2, 4[illegible]
	New York 22, 16 East [illegible] Street
	[illegible] 2, 218 [illegible] Street
	Rochester 18, 17[illegible] [illegible] Avenue
NORTH CAROLINA	Charlotte, 1106 [illegible] Building
OHIO	[illegible] 2330 Victory Parkway
	Cleveland 15, [illegible] Building
	Columbus 15, [illegible] Tower
	[illegible] Room [illegible]
	[illegible]
OKLAHOMA	[illegible]
OREGON	[illegible]
PENNSYLVANIA	Philadelphia [illegible]
	Pittsburgh, 6[illegible]
SOUTH CAROLINA	Greenville, 216 [illegible]
TENNESSEE	Memphis, 8[illegible] North Third Street
	Nashville [illegible]
TEXAS	Dallas 4, 101 [illegible] Building
	Houston 19, [illegible] Room 204
	San Antonio [illegible]
UTAH	[illegible]
VIRGINIA	[illegible] Road [illegible]
	Richmond [illegible]
WASHINGTON	Seattle 4, [illegible]
	Spokane 3044 [illegible]
WEST VIRGINIA	Charleston, 312 [illegible]
WISCONSIN	[illegible]
DISTRICT OF COLUMBIA	Washington [illegible]
INTERNATIONAL DIVISION	[illegible]

[illegible]ing Fiberglas Corporation

[illegible] COAST, Santa Clara, Calif. [illegible] TEXTILE PRODUCTS [illegible] York, N.Y.

[illegible] GENERAL OFFICES AND GENERAL PRODUCTS, Toledo, Ohio

KAYLO pipe insulation





Kaylo Pipe Insulation presents a superior final appearance when applied to a variety of irregularly-shaped high temperature vessels

note

high temperature insulation for [illegible] or outdoor piping [illegible] to 1200 F operating temperature

(for temperatures ranging from 1200 F to 1800 F, see Kaylo-20, page 30)

Kaylo* pipe insulation, a near white, rigid hydrous [illegible] cium silicate heat insulation, manufactured by Owens Corning Fiberglas Corporation, effectively insulates [illegible] door and outdoor piping to 1200 F. A chemically reacted material, Kaylo pipe insulation contains no [illegible] binder. For mechanical effects, a small amount [illegible] bestos fiber is included at the time of manufacture.

This thoroughly tested and field-proven material contains the physical properties most desired for efficient, durable insulation work. It retains an appreciable percentage of its strength even after complete saturation in water, original efficiency returning after dry [illegible] effectiveness, high strength and moisture resistance [illegible] unattained by most other insulating materials.

sizes

thickness Kaylo Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe [illegible] Tube Insulation is available in thickness [illegible]

pipe sizes Kaylo Pipe Insulation is available to fit pipe from [illegible] in diameter. Kaylo Tube Insulation [illegible] *fit copper tubing from [illegible] to 3½" in diameter.*

forms Kaylo Pipe Insulation is available in sectional [illegible] multisegmental form depending upon pipe size. All insulation [illegible] forms [illegible] sections.

jackets

canvas Kaylo Sectional Pipe Insulation includes standard canvas jackets, at no additional charge, on thicknesses up to and including 2½". Standard canvas [illegible] available for segmental forms at a slight additional [illegible] Bands are available for use with this product at [illegible] additional charge and will be *furnished on request.*

6 oz. and 8 oz. canvas jackets are available for all type sizes and thicknesses of *Kaylo Pipe and Tube Insulation* at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms, they are furnished but not adhered.

limitations

pipe insulations



physical properties

density	approximately 11 lb. per cu. ft.
flexural strength	ASTM C 203, over 50 lb. per sq. in.
compressive strength (at 5% deformation)	
before heating	(ASTM C 165) 150 lb. per sq. in.
after heating for 24 hours	
at 750 F	144 lb. per sq. in.
at 1000 F	123 lb. per sq. in.
at 1200 F	117 lb. per sq. in.
after boiling for 24 hours (while wet)	74 lb. per sq. in.

resistance to abrasion

(conventional tumbling test loss in weight after 10 min.)

before heating	9%
after heating for 24 hours	
at 750 F	5%
at 1000 F	4%
at 1200 F	3%

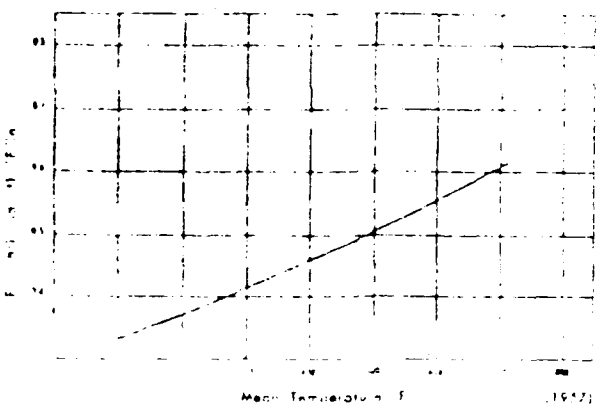
alkalinity, ph 10

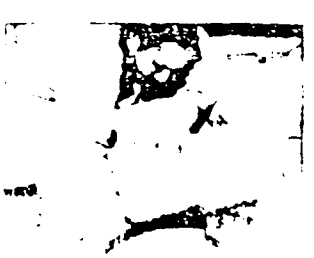
dimensional stability

linear shrinkage after heating for 24 hours in muffle

at 750 F	0.8%
at 1000 F	0.9%
at 1200 F	1.4%

thermal conductivity





specifications

for insulation of piping with Kaylo and Kaylo-20 pipe insulation

specification compliance

HH-I-523a Insulation Block, Pipe Covering and Cement, Thermal Calcium Silicate (for Temperatures up to 1200 F) Class 2

MIL-I-2781B Insulation Pipe Covering Thermal

1. Insulating materials

All heated pipes shall be insulated with Kaylo Pipe Insulation as manufactured by Owens Corning Fiberglas Corporation, to the thickness noted on drawings [illegible] in the table.

2. Application

All Pipe Insulation shall be applied over clean, dry surfaces, butting adjoining sections firmly together. Insulation on pipes under 12" diameter shall have [illegible] applied canvas pasted neatly in place.

Insulation on pipes over 12" diameter and all [illegible] piping shall be wired in place with 16 gauge [illegible] wire on no greater than 9" centers. When [illegible] insulation is applied, the first layer [illegible] in place without jacket; the second [illegible] applied with all joints staggered.

All flanges, valves and fittings shall be insulated with fabricated mitered segments of pipe insulation equal in thickness to the insulation on the adjoining pipe. Fittings on pipe size of 3" and smaller may be insulated with O-C 110 Insulating Cement of equal thickness.

3. Surface finish

Indoor piping under 12" diameter not subject to abrasion or mechanical abuse requires no finish [illegible] factory-furnished canvas. [illegible] 12" [illegible] shall be finished [illegible] place.

Piping located outdoors shall be finished with [illegible] lb. roofing felt jacket with all joints lapped not less than 2". Jackets shall be wired with 16 ga. copper wire on not greater than 9" centers or banded on 12" centers with ½" galvanized bands. Other suitable weatherproof jackets such as metal, asphalt or plastic coating may be applied according to the jacket manufacturers' specifications.

Insulation on flanges, valves and fittings shall be covered with a ¼" coat of O-C 110 Insulating Cement. Insulation located indoors shall be further finished with canvas neatly pasted in place.

All insulation on flanges, valves and fittings [illegible] outdoors shall be covered with [illegible] weatherproof mastic reinforced with an open mesh [illegible] tape. Mastic shall be applied in [illegible] thickness [illegible] dry coat and [illegible] [illegible]

[illegible] of application

Design data for Kaylo Insulations

The following data are presented to aid in the design of Kaylo Pipe Insulation modified to meet specific needs. Recommendations [illegible] should be modified to [illegible] conditions and job requirements.

[illegible] reference data for information on the [illegible] thicknesses according to the simplified Dimensional Standard System.

[illegible] pipe insulation applies easily and quickly with [illegible] application methods. Ordinary tools of the trade [illegible] sufficient for all cutting, sawing or scoring. It is non-[illegible] to the skin and non-toxic.

[illegible] thicknesses of insulation vary to a substantial degree in different industries principally because of:

1. Cost of fuel operation time
2. Fixed charges or anticipated rate of installation

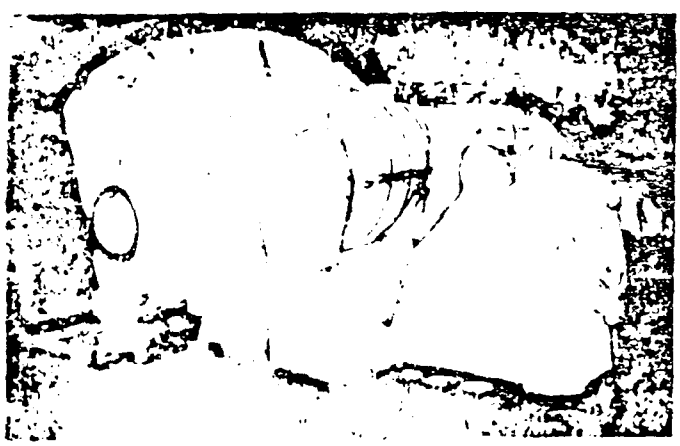
Economical Thickness recommendations may not apply [illegible] insulation is applied for process temperature [illegible] personnel protection or fire protection for specific [illegible]. Refer to Kaylo Performance Data Book for [illegible] design for such conditions.

Because these two factors vary greatly by [illegible] table of recommended thickness would be [illegible] approximation. To approach more closely a true "[illegible] Thickness," the recommended thickness data on [illegible] three pages is presented for three [illegible] commercial and industrial, power and utility, and process industries.

Applications—Kaylo and Kaylo-20

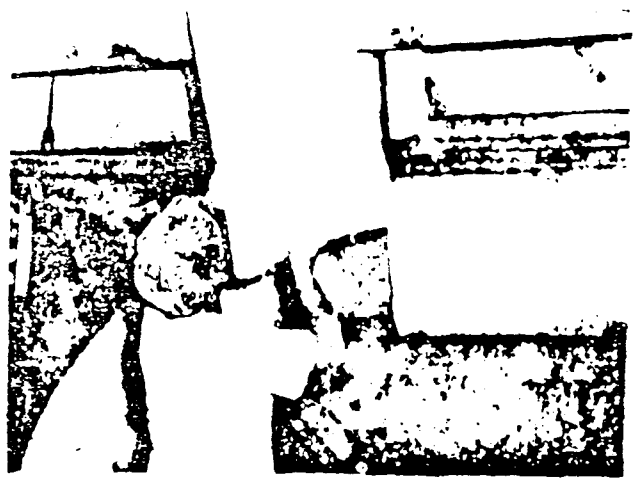


[illegible] Off-site yard steam insulated with Kaylo Pipe Insulation for efficiency controlled temperatures at distant points.



Kaylo [illegible] being used on the head of a high [illegible]





Kaylo Pipe Insulation application on high pressure steam piping central station generating facilities.



recommended thicknesses—Kaylo

(ambient still air at 80 F)

pipe temp	280 F				480 F				680 F			
temp. dif.	200 F				400 F				600 F			
pipe size	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST
½	1	128	79.2	0	1½	193	84.7	97	2	322	91.4	119
¾		34	79.5	0	1½	6	87.6	0	2½	444	91.7	113
1		359	82.6	0	1½	6	89.7	102	2½	8	91	115
1¼		418	82.9	96	1½	732	90	0	2½	983	92.7	109
1½		46	84.0	94	2	558	92.2	103	3	892	94.2	102
2		5	84.9	0	2	803	92.8	0	3	8	94	106
2½		4	85.5	0	2	6	93.2	95	3	5	94	97
3		5	85.7	0	2½	0	0	94	3½	134	95	97
4		86.4	86.5	108	2½	107	94.4	0	3½	46	95.4	0
5	1	106	86.5	0	2½	126	94.6	0	3½	64	95.7	0
6	1½	94.2	90.0	100	2½	143	94.8	109	4	9	95	97
7	1½	0	90.3	0	2½	162	94.8	109	4	0	0	108
8	1½	114	90.4	104	2½	174	95.0	110	4	0	95.1	109
9	1½	0	90.4	104	2½	188	95.2	0	4	222	95.4	0
10	1½	32	90.5	0	3	79	95.9	108	4½	0	95.6	108
12	1½	153	91.0	104	3	0	95.9	107	4½	27	0	109
14	1½	178	90.4	106	3	233	95.8	108	4½	274	95.7	109
16	1½	204	90.4	0	3	265	95.9	106	5	284	95.8	108
18	1½	229	90.5	108	3	285	96.0	109	5	321	95.9	109
20	1½	245	90.5	108	3½	0	96.1	106	5	343	95.9	109
24	1½	291	90.5	0	3½	0	96.2	107	5½	394	96.1	108

KEY

RT— Recommended Thickness

HL— Heat Loss Btu/Lin. ft./hr.

E— Insulation Efficiency

ST— Surface Temperature.

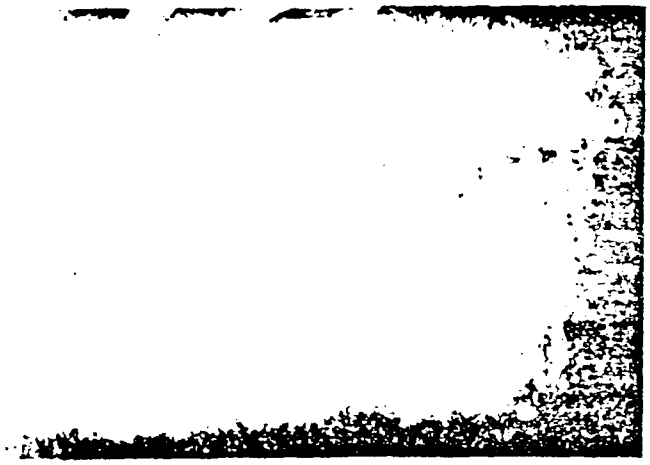
C— Commercial and Industrial

U— Power and Utility

P— Process Industries

pipe temp	280 F				480 F				680 F				880 F				1080 F				1200 F			
temp. dif.	200 F				400 F				600 F				800 F				1000 F				1120 F			
pipe size	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST
½	1	128	79.2	0	1½	193	84.7	97	2	322	91.4	119	2½	428	93.4	124	3	545	95.2	127	3½	615	95.9	129
¾		34	79.5	0	1½	6	87.6	0	2½	444	91.7	113	2½	5	93.2	118	3	644	95.3	122	3½	722	95.9	124
1		359	82.6	0	1½	6	89.7	102	2½	8	93	115	2½	6	94.0	120	3	751	96	120	3½	844	96.4	0
1¼		418	82.9	96	1½	732	90	0	2½	983	92.7	109	3	0	0	0	3	875	96.3	125	3½	0	0	0
1½		46	84.0	94	2	558	92.2	103	3	892	94.2	102	3	0	95.5	0	3	927	96.8	122	3½	999	97.1	0
2		5	84.9	0	2	803	92.8	0	3	8	94	106	3	170	95.6	126	3	206	96.9	130	4	215	97.2	0
2½		4	85.5	0	2	6	93.2	95	3	5	94	97	3	181	96.3	124	3	206	97.5	129	4	231	97.8	0
3		5	85.7	0	2½	0	0	94	3½	134	95	97	3	197	96.6	124	3½	236	97.6	126	4	267	97.9	0
4		86.4	86.5	108	2½	107	94.4	0	3½	46	95.4	0	3	222	97	124	3½	274	97.8	130	4½	284	98.0	120
5	1	106	86.5	0	2½	126	94.6	0	3½	64	95.7	0	3	256	97.1	128	4	292	98.1	125	4½	324	98.2	0
6	1½	94.2	90.0	100	2½	143	94.8	109	4	9	95	97	3½	268	97.5	122	4	332	98.5	129	5	344	98.5	0
7	1½	0	90.3	0	2½	162	94.8	109	4	0	0	108	3½	297	97.6	125	4½	333	98.5	124	5	377	98.4	0
8	1½	114	90.4	104	2½	174	95.0	110	4	0	95.1	109	3½	326	97.7	126	4½	366	98.5	125	5½	389	98.7	124
9	1½	0	90.4	104	2½	188	95.2	0	4	222	95.4	0	3½	351	97.7	127	4½	402	98.5	128	5½	416	98.6	124
10	1½	32	90.5	0	3	79	95.9	108	4½	0	95.6	108	3½	392	97.7	129	4½	440	98.5	130	6	452	98.9	0
12	1½	153	91.0	104	3	0	95.9	107	4½	27	0	109	4	415	98	125	5	462	98.8	127	6	510	99	129
14	1½	178	90.4	106	3	233	95.8	108	4½	274	95.7	109	4	447	98	128	5	501	98.7	129	6	556	99.1	0
16	1½	204	90.4	0	3	265	95.9	106	5	284	95.8	108	4	468	98	128	5	562	98.7	130	6	621	99	0
18	1½	229	90.5	108	3	285	96.0	109	5	321	95.9	109	4	547	98	129	5½	545	98.8	127	6	672	99.0	124
20	1½	245	90.5	108	3½	0	96.1	106	5	343	95.9	109	4	594	98.1	130	5½	605	98.9	128	6	733	99	126
24	1½	291	90.5	0	3½	0	96.2	107	5½	394	96.1	108	4½	698	98.4	126	5½	685	98.9	129	6	841	99.1	127
½	1	128	79.2	0	1½	193	84.7	97	2	322	91.4	119	2½	424	91.6	136	2	146	94.1	134	2	179	94.2	149
¾		34	79.5	0	1½	6	84.4	0	2½	444	91.8	113	2½	445	93.1	145	2	166	94.6	141	2½	175	95.5	134
1		359	82.6	0	1½	6	89.7	102	2½	8	93	115	2½	6	94.0	127	2½	174	95.4	134	2½	198	95.9	141
1¼		418	82.9	96	1½	732	90	0	2½	983	92.7	109	2	0	0	127	2	180	94.4	135	3	188	96.1	135	3	211	95.5	137
1½		46	84.0	94	2	558	92.2	103	3	892	94.2	102	2	0	95.5	126	2½	207	96.2	142	3	212	96.9	136
2		5	84.9	0	2	803	92.8	0	3	8	94	106	2	189	95.8	135	2½	223	96.7	138	3	250	97.1	142
2½		4	85.5	0	2	6	93.2	95	3	5	94	97	2	200	96.4	132	2½	237	97.1	134	3	266	97.4	139
3		5	85.7	0	2½	0	0	94	3½	134	95	97	2	230	95.7	145	2½	292	97.0	147	3	316	97.5	47
4		86.4	86.5	108	2½	107	94.4	0	3½	46	95.4	0	2	263	96	148	3	299	97.6	137	3½	335	97.9	145
5	1	106	86.5	0	2½	126	94.6	0	3½	64	95.7	0	2½	294	96.8	137	3	347	97.8	140	3½	388	98.0	145
6	1½	94.2	90.0	100	2½	143	94.8	109	4	9	95	97	2½	317	96.9	139	3	403	98	147	3½	430	98.2	147
7	1½	0	90.3	0	2½	162	94.8	109	4	0	0	108	2½	335	97.0	141	3½	386	98.3	135	3½	471	98.2	49
8	1½	114	90.4	104	2½	174	95.0	110	4	0	95.1	109	3	349	97.2	140	3½	422	98.2	137	4	474	98.4	142
9	1½	0	90.4	104	2½	188	95.2	0	4	222	95.4	0	3	431	97.2	142	3½	459	98.3	138	4	513	98.5	42
10	1½	32	90.5	0	3	79	95.9	108	4½	0	95.6	108	3½	482	97	41	3½	504	98.3	140	4	563	98.6	46
12	1½	153	91.0	104	3	0	95.9	107	4½	27	0	109	4	0	97.1	48	3½	576	99.3	143	4	642	98.6	148
14	1½	178	90.4	106	3	233	95.8	108	4½	274	95.7	109	4	0	0	0	4	642	98.2	147	4½	647	98	144
16	1½	204	90.4	0	3	265	95.9	106	5	284	95.8	108	4	0	0	0	4	642	98.5	45	4½	722	0	0
18	1½	229	90.5	108	3	285	96.0	109	5	321	95.9	109	4	0	0	0	4	727	98.6	46	5	818	0	0
20	1½	245	90.5	108	3½	0	96.1	106	5	343	95.9	109	4	0	0	0	4	727	98.6	46	5	810	0	0
24	1½	291	90.5	0	3½	0	96.2	107	5½	394	96.1	108	4½	0	0	0	5	0	0	0	6	0	0	0

KAYLO-20 pipe insulation



Kaylo® 20 Insulation, colored pink for identification, is a high temperature calcium silicate heat insulation manufactured by Owens Corning Fiberglas extends the range of Kaylo Heat Insulation to include temperatures up to 1800 F with all the properties of moisture resistance and high strength of standard Kaylo material. It also may be used with outer layers of Fiberglas Pipe Insulation to provide ultimate balance of cost and efficiency.

Kaylo 20 Insulation is highly dimensionally stable at the temperatures for which it is designed. Resistance of this insulation to high temperatures makes it exceptionally effective in protecting fluids in the pipe at these temperatures.

sizes

thickness - Kaylo 20 Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo-20 Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes - Kaylo-20 Pipe Insulation is available to fit pipe from ½" to 30" in diameter. Kaylo-20 Tube Insulation is available in tubular sizes with I.D. sizing from ½" to 3½".

forms - Kaylo 20 Pipe Insulation is available in sectional or nesting segmental form depending upon pipe size. All insulation is furnished in 3' sections.

jackets

canvas - Standard canvas jackets are available on all types and thicknesses of Kaylo-20 Pipe Insulation at additional cost. Kaylo-20 Sectional Pipe and Tube Insulation in thicknesses up to and including 2" is available with standard canvas as available for segmental forms at slight additional cost. Bands are available for securing jackets at a small additional charge. Bands are supplied only on request.

6 oz. and 8 oz. canvas jackets are available on all types and thicknesses of Kaylo-20 Pipe Insulation at additional charge. These jackets are factory applied on sectional pipe and tube insulation. On segmental insulation, they are furnished but not adhered.

limitations

Kaylo 20 Insulation is designed for use at temperatures up to [illegible] operating temperature.

note:

high temperature insulation and fireproofing for indoor and outdoor piping up to 1200 F operating temperature

physical properties

density:
approximately 12 lbs. per cu. ft.

flexural strength: (ASTM C-203)
90 lbs. per sq. in.

compressive strength: (ASTM C 165)
130 lbs. per sq. in. at 5% deformation

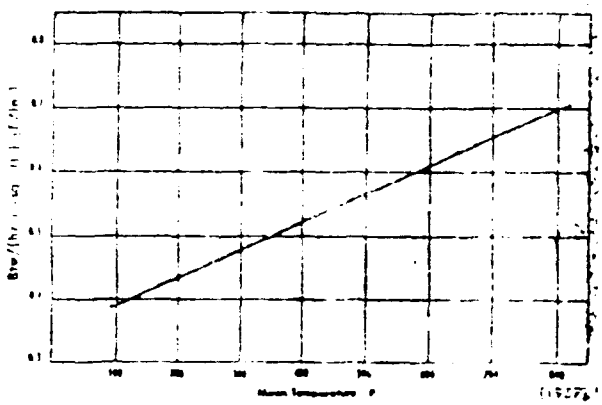
dimensional stability:
linear shrinkage after heating for 24 hours in muffle
at 1200 F 0.7%
at 1800 F 1.6%

resistance to abrasion:
(conventional tumbling test—loss in weight after 10 min.)
before heating 3%
after heating for 24 hours
at 1200 F 5%
at 1800 F 20%

alkalinity: ph 10

working temperature: up to 1800 F

thermal conductivity



recommended thicknesses

[illegible] average figures and may be adapted to meet specific conditions encountered on specific jobs. Kaylo heat loss data is available for use where plant operating economics and other conditions demand greater insulation thicknesses. The surface temperatures are in the 150F range.

Pipe Size	Temperature Difference F							
	1100	1200	1300	1400	1500	1600	1700	1800
½	2½	2½	3	3	3½	3½	4	4
¾	2½	2½	3	3	3½	3½	4	4
1	2½	3	3	3	3½	3½	4	4½
1¼	2½	3	3	3½	3½	4	4½	4½
1½	3	3	3½	3½	3½	4	4½	5
2	3	3	3½	3½	4	4	4½	5
2½	3	3½	3½	4	4	4½	5	5½
3	3½	3½	3½	4	4	4½	5	5½
3½	3½	3½	4	4	4½	5	5½	6
4	3½	3½	4	4	4½	5	5½	6
6	4	4	4½	4½	5	5½	6	6½
8	4	4	4½	4½		5½	6	6½
							6½	



insulation thickness standards—
Kaylo and Kaylo-20

CT

nom. tube size	O.D. of tube (nom.)	single layer			
		nom. 1"		nom. 1½"	
		actual	O.D.	actual	O.D.
⅜"	⅝"	1.18	2.88	1.36	3.50
½"	¾"	1.11	2.88	1.42	3.50
¾"	⅞"	1.05	2.88	1.55	4.00
¾"	1"	.90	2.88	1.55	4.00
1"	1⅛"	1.07	3.50	1.42	4.00
1¼"	1⅜"	1.05	3.50	1.55	4.50
1½"	1⅝"	1.17	4.00	1.42	4.50
2"	2⅛"	.91	4.00	1.31	5.00
2½"	2⅝"	.91	4.50	1.45	5.56
3"	3⅛"	.91	5.00	1.73	6.66

note:

Insulations for tubing sizes other than standard sizes shown are available only as cut-downs from next larger size tube or pipe and will be slightly elliptical in shape

KEY

IP — Iron pipe siz

CT — copper tubin

IL—Inner Layer
OL—Outer Layer

IP

nom. pipe size	O.D. of pipe	single layer only				single or double layer						multiple layer—recommended combinations													
		nom. 1"		nom. 1½"		nom. 2"		nom. 2½"		nom. 3"		2"		2½"		3"		3½"		4"		4½"		5	
												IL		IL		IL		IL		IL		IL		IL	
		actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	OL		OL		OL		OL		OL		OL		OL	
⅛"	.84	1.00	2.88	1.36	4.00	2.06	5.00	2.89	6.66	3.39	7.66	2 x1	2 x1	2 x1	2 x1	½x1 ½	½x1 ½	½x1 ½	½x1 ½	½x2	½x2	½x2	½x2	½x2	½x2
¼"	1.05	1.00	2.88	1.36	4.00	1.96	5.00	2.79	6.66	3.29	7.66	2½ x1	2½ x1	2½ x1	2½ x1	¾x1 ½	¾x1 ½	¾x1 ½	¾x1 ½	¾x2	¾x2	¾x2	¾x2	¾x2	¾x2
⅜"	1.32	1.08	3.50	1.58	4.50	2.11	5.58	2.88	8.66	3.16	7.56	3 x1	3 x1	3 x1	3 x1	1 x1 ½	1 x1 ½	1 x1 ½	1 x1 ½	1 x2	1 x2	1 x2	1 x2	1 x2	1 x2
½"	1.66	.90	3.50	1.66	5.00	1.94	5.56	2.48	8.66	2.98	7.88	3 x1	3 x1	3 x1	3 x1	1¼x1 ½	1¼x1 ½	1¼x1 ½	1¼x1 ½	1¼x2	1¼x2	1¼x2	1¼x2	1¼x2	1¼x2
¾"	1.90	1.01	4.00	1.53	5.00	2.34	6.66	2.83	7.66	3.36	8.58	3½ x1	3½ x1	3½ x1	3½ x1	1½x1 ½	1½x1 ½	1½x1 ½	1½x1 ½	1½x2	1½x2	1½x2	1½x2	1½x2	1½x2
1"	2.38	1.05	4.50	1.57	5.56	2.42	6.66	2.62	7.66	3.42	8.68	4 x1	4 x1	4 x1	4 x1	2 x1 ½	2 x1 ½	2 x1 ½	2 x1 ½	2 x2	2 x2	2 x2	2 x2	2 x2	2 x2
1¼"	2.88	1.03	5.00	1.67	6.66	2.32	7.56	2.82	8.66	3.32	9.68	5 x1	5 x1	5 x1	5 x1	2½x1 ½	2½x1 ½	2½x1 ½	2½x1 ½	2½x2	2½x2	2½x2	2½x2	2½x2	2½x2
1½"	3.50	1.00	5.56	1.53	6.66	2.05	7.56	2.55	8.66	3.05	9.68	6 x1	6 x1	6 x1	6 x1	3 x1 ½	3 x1 ½	3 x1 ½	3 x1 ½	3 x2	3 x2	3 x2	3 x2	3 x2	3 x2
2"	4.50	1.05	6.66	1.55	7.66	2.05	8.66	2.55	9.66	3.05	10.78	7 x1	7 x1	7 x1	7 x1	3½x1 ½	3½x1 ½	3½x1 ½	3½x1 ½	3½x2	3½x2	3½x2	3½x2	3½x2	3½x2
2½"	5.00	1.00	7.66	1.80	8.66	2.30	9.66	2.80	10.78	3.30	11.78	8 x1	8 x1	8 x1	8 x1	4 x1 ½	4 x1 ½	4 x1 ½	4 x1 ½	4 x2	4 x2	4 x2	4 x2	4 x2	4 x2
3"	5.56	1.02	7.66	1.52	8.66	2.02	9.66	2.52	10.78	3.03	11.78			4½x1	4½x1	4½x1 ½	4½x1 ½	4½x2	4½x2	4½x2	4½x2	4½x2	4½x2	4½x2	4½x2
3½"	6.63	.95	8.66	1.45	9.66	2.02	10.78	2.53	11.78	3.03	12.81			7 x1	7 x1	8 x1 ½	8 x1 ½	8 x2	8 x2	9 x2	9 x2	9 x2	9 x2	9 x2	9 x2
4"	7.63			1.52	10.78	2.02	11.78	2.53	12.81	3.16	14.06					5 x1 ½	5 x1 ½	5 x2	5 x2	5 x2	5 x2	5 x2	5 x2	5 x2	5 x2
5"	8.63			1.52	11.78	2.03	12.81	2.78	13.94	3.47	15.06					6 x1 ½	6 x1 ½	6 x2	6 x2	6 x2	6 x2	6 x2	6 x2	6 x2	6 x2
6"	9.63			1.53	12.81	2.15	13.94	2.66	15.06	3.42	16.00					7 x1 ½	7 x1 ½	7 x2	7 x2	7 x2	7 x2	7 x2	7 x2	7 x2	7 x2
8"	10.75			1.59	13.94	2.84	15.06	2.91	16.00	3.06	17.00					8 x1 ½	8 x1 ½	8 x2	8 x2	8 x2	8 x2	8 x2	8 x2	8 x2	8 x2
10"	11.75			1.59	15.06	2.09	16.06	2.55	17.00	3.05	18.00					9 x1 ½	9 x1 ½	9 x2	9 x2	9 x2	9 x2	9 x2	9 x2	9 x2	9 x2
12"	12.75			1.59	16.06	2.05	17.00	2.55	18.00	3.05	19.00					10 x1 ½	10 x1 ½	10 x2	10 x2	10 x2	10 x2	10 x2	10 x2	10 x2	10 x2
14"	14.00			1.42	17.00	1.92	18.00	2.42	19.00	2.92	20.00					11 x1 ½	11 x1 ½	11 x2	11 x2	11 x2	11 x2	11 x2	11 x2	11 x2	11 x2
15"	15.00			1.42	18.00	1.92	19.00	2.42	20.00	2.92	21.00					12 x1 ½	12 x1 ½	12 x2	12 x2	12 x2	12 x2	12 x2	12 x2	12 x2	12 x2
16"	16.00			1.41	19.00	1.91	20.00	2.41	21.00	2.91	22.00					13 x1 ½	13 x1 ½	13 x2	13 x2	13 x2	13 x2	13 x2	13 x2	13 x2	13 x2
17"	17.00			1.41	20.00	1.91	21.00	2.41	22.00	2.91	23.00					14 x1 ½	14 x1 ½	14 x2	14 x2	14 x2	14 x2	14 x2	14 x2	14 x2	14 x2
18"	18.00			1.41	21.00	1.91	22.00	2.41	23.00	2.91	24.00					15 x1 ½	15 x1 ½	15 x2	15 x2	15 x2	15 x2	15 x2	15 x2	15 x2	15 x2
19"	19.00			1.41	22.00	1.91	23.00	2.41	24.00	2.91	25.00					16 x1 ½	16 x1 ½	16 x2	16 x2	16 x2	16 x2	16 x2	16 x2	16 x2	16 x2
20"	20.00			1.41	23.00	1.91	24.00	2.41	25.00	2.91	26.00					17 x1 ½	17 x1 ½	17 x2	17 x2	17 x2	17 x2	17 x2	17 x2	17 x2	17 x2
22"	22.00			1.41	25.00	1.91	26.00	2.41	27.00	2.91	28.00					18 x1 ½	18 x1 ½	18 x2	18 x2	18 x2	18 x2	18 x2	18 x2	18 x2	18 x2
24"	24.00			1.41	27.00	1.91	28.00	2.41	29.00	2.91	30.00					19 x1 ½	19 x1 ½	19 x2	19 x2	19 x2	19 x2	19 x2	19 x2	19 x2	19 x2
25"	25.00			1.46	28.00	1.96	29.00	2.50	30.00	3.02	31.00					20 x1 ½	20 x1 ½	20 x2	20 x2	20 x2	20 x2	20 x2	20 x2	20 x2	20 x2
26"	26.00			1.46	29.00	1.96	30.00	2.50	31.00	3.02	32.00					21 x1 ½	21 x1 ½	21 x2	21 x2	21 x2	21 x2	21 x2	21 x2	21 x2	21 x2
27"	27.00			1.46	30.00	1.96	31.00	2.50	32.00	3.02	33.00					22 x1 ½	22 x1 ½	22 x2	22 x2	22 x2	22 x2	22 x2	22 x2	22 x2	22 x2
28"	28.00			1.46	31.00	1.96	32.00	2.50	33.00	3.02	34.00					23 x1 ½	23 x1 ½	23 x2	23 x2	23 x2	23 x2	23 x2	23 x2	23 x2	23 x2
29"	29.00			1.46	32.00	1.96	33.00	2.50	34.00	3.02	35.00					24 x1 ½	24 x1 ½	24 x2	24 x2	24 x2	24 x2	24 x2	24 x2	24 x2	24 x2
30"	30.00			1.46	33.00	1.96	34.00	2.50	35.00	3.02	36.00					25 x1 ½	25 x1 ½	25 x2	25 x2	25 x2	25 x2	25 x2	25 x2	25 x2	25 x2
32"	32.00			1.46	35.00	1.96	36.00	2.50	37.00	3.02	38.00					26 x1 ½	26 x1 ½	26 x2	26 x2	26 x2	26 x2	26 x2	26 x2	26 x2	26 x2
34"	34.00			1.46	37.00	1.96	38.00	2.50	39.00	3.02	40.00					27 x1 ½	27 x1 ½	27 x2	27 x2	27 x2	27 x2	27 x2	27 x2	27 x2	27 x2
36"	36.00			1.46	39.00	1.96	40.00	2.50	41.00	3.02	42.00					28 x1 ½	28 x1 ½	28 x2	28 x2	28 x2	28 x2	28 x2	28 x2	28 x2	28 x2
38"	38.00			1.46	41.00	1.96	42.00	2.50	43.00	3.02	44.00					29 x1 ½	29 x1 ½	29 x2	29 x2	29 x2	29 x2	29 x2	29 x2	29 x2	29 x2
40"	40.00			1.46	43.00	1.96	44.00	2.50	45.00	3.02	46.00					30 x1 ½	30 x1 ½	30 x2	30 x2	30 x2	30 x2	30 x2	30 x2	30 x2	30 x2
42"	42.00			1.46	45.00	1.96	46.00	2.50	47.00	3.02	48.00					31 x1 ½	31 x1 ½	31 x2	31 x2	31 x2	31 x2	31 x2	31 x2	31 x2	31 x2
44"	44.00			1.46	47.00	1.96	48.00	2.50	49.00	3.02	50.00					32 x1 ½	32 x1 ½	32 x2	32 x2	32 x2	32 x2	32 x2	32 x2	32 x2	32 x2
46"	46.00			1.46	49.00	1.96	50.00	2.50	51.00	3.02	52.00					33 x1 ½	33 x1 ½	33 x2	33 x2	33 x2	33 x2	33 x2	33 x2	33 x2	33 x2
48"	48.00			1.46	51.00	1.96	52.00	2.50	53.00	3.02	54.00					34 x1 ½	34 x1 ½	34 x2	34 x2	34 x2	34 x2	34 x2	34 x2	34 x2	34 x2

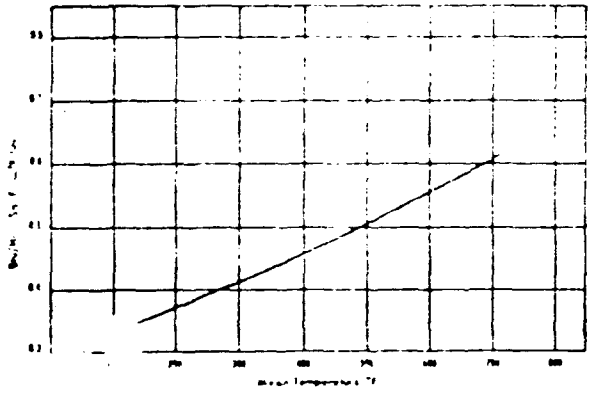
K-Segmental Dimensions — Letter — In. Dia. — O. Dia. — Ar...

pipe insulations to 1200° F.

physical properties

density	approximately 11 lb per cu. ft.
flexural strength	50 lb per sq. in.
compressive strength (at 5% deformation)	
before heating	150 lb per sq. in.
after heating for 24 hours	
at 750°F.	144 lb per sq. in.
at 1000°F.	123 lb per sq. in.
at 1200°F.	117 lb per sq. in.
after boiling for 24 hours (while wet)	74 lb per sq. in.
resistance to abrasion	
(conventional tumbling test-loss in weight after 10 min.)	
before heating	2.2%
after heating for 24 hours	
at 750°F.	3.7%
at 1000°F.	5.2%
at 1200°F.	6.9%
dimensional stability	
linear shrinkage after heating for 24 hours	
at 750°F.	0.8%
at 1000°F.	0.9%
at 1200°F.	1.4%
elongation after saturation (max.)	0.04%
moisture adsorption (volume)	
after 6 hours exposure in atmosphere at 120°F and 90% relative humidity	0.9%

thermal conductivity





ease of application

Kaylo Pipe Insulation applies easily and quickly with standard application methods.

specifications

for insulation of piping with Kaylo and Kaylo-20 pipe insulation

specification compliance

HH-I-523a Insulation Block, Pipe Covering and Cement, Thermal, Calcium Silicate (For Temperatures up to 1200°F.)

MIL-I-27815 Insulation Pipe Covering, Thermal

1. Insulating materials

All heated pipes shall be insulated to the thickness shown on drawings or as shown in the table on page 2 with Kaylo Pipe Insulation as distributed by Owens-Corning Fiberglas Corporation.

2. Application

All Pipe Insulation shall be applied over clean, dry surfaces, butting adjoining sections firmly together. Insulation on pipes under 12" diameter shall have factory-applied canvas pasted neatly in place.

Insulation on pipes over 12" diameter and all outdoor piping shall be wired in place with 16 gauge soft annealed wire on no greater than 9" centers. Where double layer insulation is applied, the first layer shall be wired in place without jacket, the second layer shall be applied with all joints staggered.

All flanges, valves and fittings shall be insulated with fabricated mitered segments of pipe insulation equal in thickness to the insulation on the adjoining pipe. Fittings on pipe size of 3" and smaller may be insulated with insulating cement of equal thickness.

3. Surface finish

Indoor piping under 12" diameter not subject to abrasion or mechanical abuse requires no finish in addition to the factory-furnished canvas. Piping over 12" diameter shall be finished with 6-ounce canvas pasted in place.

Piping located outdoors shall be finished with 45-lb. roofing felt jacket with all joints lapped not less than 2". Jackets shall be wired with 16 ga. copper wire on not greater than 9" centers or banded on 12" centers with ½" galvanized bands. Other suitable weatherproof jackets such as metal, asphalt or plastic coating may be applied according to the jacket manufacturers' specifications.

Insulation on flanges, valves and fittings shall be covered with a ⅛" coat of finishing cement. Portland cement to a maximum of 25% dry weight may be added if a harder finish is desired. Insulation located indoors shall be further finished with canvas neatly pasted in place.

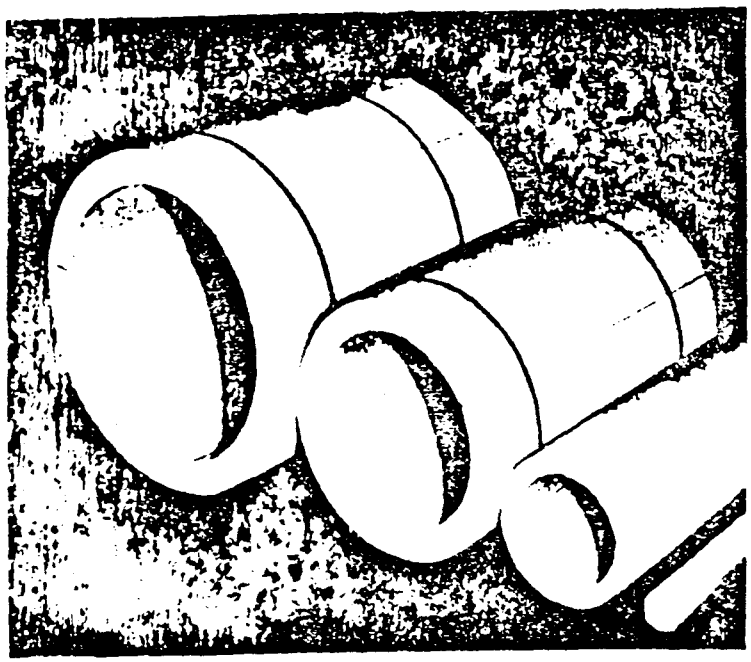
All insulation on flanges, valves and fittings located outdoors shall be covered with asphalt weatherproof mastic reinforced with an open mesh glass fabric. Mastic shall be applied in sufficient thickness to give a ⅛" dry coat and shall be troweled neatly over the fitting with the jacket on the adjacent pipe insulation lapped at least 2" over the mastic.

The foregoing is necessarily general in nature. Application procedure is at the discretion and responsibility of the design engineer to meet specific job requirements.

Kaylo pipe insulation

note:

high temperature insulation for indoor or outdoor piping up to 1200° F. operating temperature





Kaylo Pipe Insulation presents a superior final appearance when applied to a variety of irregularly-shaped high temperature vessels.

(for temperatures ranging from 1200°F. to 1800°F., see Kaylo-20, page 26)

Kaylo® pipe insulation, a white, rigid hydrous calcium silicate heat insulation, manufactured by Owens-Illinois Glass Company and distributed nationally by Owens-Corning Fiberglas Corporation, effectively insulates indoor and outdoor piping to 1200°F. A chemically reacted material, Kaylo pipe insulation contains no added binder. For mechanical effects, a small amount of asbestos fiber is included at the time of manufacture.

This thoroughly tested and field-proven material contains the physical properties most desired for efficient, durable insulation work. It retains an appreciable percentage of its strength even after complete saturation in water, original efficiency returning after drying. The effectiveness, high strength and moisture resistance are unattained by most other insulating materials.

sizes

thickness—Kaylo Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes—Kaylo Pipe Insulation is available to fit pipe from ½" to 39" in diameter. Kaylo Tube Insulation will fit copper tubing from ½" to 3⅛" in diameter.

forms—Kaylo Pipe Insulation is available in sectional or multisegmental form depending upon pipe size. All insulation is furnished in 3' sections.

jackets

canvas—Kaylo Sectional Pipe Insulation includes standard canvas jackets, at no additional charge, on thicknesses up to and including 2½". Standard canvas is available on segmental forms at a slight additional cost. Bands are available for use with this product at slight additional charge and will be furnished on request.

6 oz. and 8 oz. canvas jackets are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms, they are furnished but not adhered.

limitations

Kaylo Pipe Insulation is designed for temperatures up to 1200°F. and is not recommended when operating temperatures of piping exceed this limit.

®T. M. Owens-Illinois Glass Co.



insulation thickness standards—Kaylo and Kaylo-20

IRON PIPE SIZES

	nom. pipe size	O.D. of pipe	single layer only: nom. 1 actual	nom. 1 O.D.	nom. 1¼ actual	nom. 1¼ O.D.	single or double layer: nom. 2 actual	nom. 2 O.D.	nom. 2½ actual	nom. 2½ O.D.	nom. 3 actual	nom. 3 O.D.	multiple layer only: nom. 3½ actual	nom. 3½ O.D.	nom. 4 actual	nom. 4 O.D.	nom. 4½ actual	nom. 4½ O.D.	nom. 5 actual	nom. 5 O.D.
Segmental	⅛"	.84	1.00	2.88	1.56	4.00	2.06	5.00	2.89	6.66	3.39	7.66								
	¼"	1.05	1.00	2.88	1.45	4.00	1.96	5.00	2.79	6.66	3.29	7.66								
	1"	1.32	1.16	3.50	1.56	4.50	2.11	5.56	2.66	6.66	3.16	7.66								
	1¼"	1.66	1.30	3.50	1.66	5.00	1.94	5.56	2.48	6.66	2.96	7.66								
	1½"	1.90	1.03	4.00	1.53	5.00	2.36	6.66	2.86	7.66	3.36	8.66								
	2"	2.38	1.04	4.50	1.57	5.56	2.10	6.66	2.62	7.66	3.12	8.66	3.62	9.66	4.18	10.78	4.68	11.78	5.20	12.81
	2½"	2.88	1.04	5.00	1.87	6.66	2.37	7.66	2.87	8.66	3.37	9.66	3.93	10.78	4.43	11.78	4.93	12.81	5.57	14.06
	3"	3.50	1.00	5.56	1.55	6.66	2.05	7.66	2.55	8.66	3.05	9.66	3.61	10.78	4.11	11.78	4.63	12.81	5.25	14.06
	3½"	4.00	1.30	6.66	1.80	7.66	2.30	8.66	2.80	9.66	3.36	10.78	3.86	11.78	4.38	12.81	5.00	14.06	5.50	15.06
	4"	4.50	1.05	6.66	1.55	7.66	2.05	8.66	2.55	9.66	3.11	10.78	3.61	11.78	4.13	12.81	4.75	14.06	5.25	15.06
	4½"	5.00	1.30	7.66	1.80	8.66	2.30	9.66	2.86	10.78	3.36	11.78	3.88	12.81	4.50	14.06	5.00	15.06	5.51	16.09
	5"	5.56	1.02	7.66	1.52	8.66	2.02	9.66	2.58	10.78	3.08	11.78	3.59	12.81	4.22	14.06	4.72	15.06	5.23	16.09
	6"	6.63	.95	8.66	1.45	9.66	2.02	10.78	2.58	11.78	3.08	12.81	3.66	14.06	4.16	15.06	4.68	16.09	5.13	17.00
	7"	7.63			1.52	10.78	2.02	11.78	2.53	12.81	3.16	14.06	3.66	15.06	4.17	16.09	4.63	17.00	5.13	18.00
	8"	8.63			1.52	11.78	2.03	12.81	2.66	14.06	3.16	15.06	3.67	16.09	4.13	17.00	4.63	18.00	5.13	19.00
Tri-Segmental	9"	9.63			1.53	11.81	2.16	14.06	2.66	15.06	3.12	16.09	3.63	17.00	4.13	18.00	4.63	19.00	5.13	20.00
	10"	10.75			1.59	14.06	2.09	15.06	2.63	16.09	3.06	17.00	3.56	18.00	4.06	19.00	4.56	20.00	5.06	21.00
	11"	11.75			1.58	15.06	2.09	16.09	2.55	17.00	3.05	18.00	3.55	19.00	4.05	20.00	4.54	21.00	4.55	22.00
	12"	12.75			1.55	16.09	2.05	17.00	2.55	18.00	3.05	19.00	3.55	20.00	4.05	21.00	4.54	22.00	4.55	23.00
	14"	14.00			1.4	17.00	2.0	18.00	2.4	19.0	2.92	20.00	3.42	21.00	3.92	22.00	4.42	23.00	4.92	24.00
	15"	15.00			1.41	18.00	1.91	19.00	2.41	20.00	2.92	21.00	3.42	22.00	3.92	23.00	4.41	24.00	4.92	25.00
	16"	16.00			1.41	19.00	1.91	20.00	2.41	21.00	2.91	22.00	3.41	23.00	3.91	24.00	4.41	25.00	4.91	26.00
	17"	17.00			1.41	20.00	1.91	21.00	2.41	22.00	2.91	23.00	3.41	24.00	3.91	25.00	4.41	26.00	4.91	27.00
	18"	18.00			1.41	21.00	1.91	22.00	2.41	23.00	2.91	24.00	3.41	25.00	3.91	26.00	4.41	27.00	4.91	28.00
	19"	19.00			1.41	22.00	1.91	23.00	2.41	24.00	2.91	25.00	3.41	26.00	3.91	27.00	4.41	28.00	4.91	29.00
	20"	20.00			1.41	23.00	1.91	24.00	2.41	25.00	2.91	26.00	3.41	27.00	3.91	28.00	4.41	29.00	4.91	30.00
	21"	21.00			1.41	24.00	1.91	25.00	2.41	26.00	2.91	27.00	3.41	28.00	3.89	29.00	4.41	30.00	4.91	31.00
	22"	22.00			1.41	25.00	1.91	26.00	2.41	27.00	2.91	28.00	3.39	29.00	3.89	30.00	4.41	31.00	4.91	32.00
	23"	23.00			1.41	26.00	1.91	27.00	2.41	28.00	2.91	29.00	3.39	30.00	3.89	31.00	4.41	32.00	4.91	33.00
nd. Seg.	24"	24.00			1.4	27.00	1.9	28.00	2.41	29.00	2.91	30.00	3.39	31.00	3.89	32.00	4.41	33.00	5.00	34.00
K-Segmental	25"	25.00			1.46	28.00	1.96	29.00	2.50	30.00	3.00	31.00	3.44	32.00	3.96	33.00	4.48	34.00	5.00	35.00
	26"	26.00			1.46	29.00	1.98	30.00	2.50	31.00	3.02	32.00	3.44	33.00	3.96	34.00	4.48	35.00	5.00	36.00
	27"	27.00			1.46	30.00	1.98	31.00	2.50	32.00	3.02	33.00	3.44	34.00	3.96	35.00	4.48	36.00	5.00	37.00
	28"	28.00			1.46	31.00	1.98	32.00	2.50	33.00	3.02	34.00	3.44	35.00	3.96	36.00	4.48	37.00	5.00	38.00
	29"	29.00			1.46	32.00	1.98	33.00	2.50	34.00	3.02	35.00	3.44	36.00	3.96	37.00	4.48	38.00	5.00	39.00
	30"	30.00			1.46	33.00	1.98	34.00	2.50	35.00	3.04	36.00	3.44	37.00	3.96	38.00	4.48	39.00	5.00	40.00
	31"	31.00			1.46	34.00	1.98	35.00	2.50	36.00	3.02	37.00	3.44	38.00	3.96	39.00	4.48	40.00	5.00	41.00
	32"	32.00			1.46	35.00	1.98	36.00	2.50	37.00	3.02	38.00	3.44	39.00	3.98	40.00	4.48	41.00	5.00	42.00
	33"	33.00			1.46	36.00	1.98	37.00	2.50	38.00	3.02	39.00	3.48	40.00	3.98	41.00	4.48	42.00	5.00	43.00
	34"	34.00			1.46	37.00	1.98	38.00	2.50	39.00	3.02	40.00	3.48	41.00	3.98	42.00	4.48	43.00	5.00	44.00
	35"	35.00			1.46	38.00	1.98	39.00	2.50	40.00	3.02	41.00	3.48	42.00	3.98	43.00	4.48	44.00	5.00	45.00
	36"	36.00			1.46	39.00	1.98	40.00	2.50	41.00	3.02	42.00	3.48	43.00	3.98	44.00	4.48	45.00	5.00	46.00
	37"	37.00			1.46	40.00	1.98	41.00	2.50	42.00		43.00	3.48	44.00	3.98	45.00	4.48	46.00	5.00	47.00
	38"	38.00			1.46	41.00	1.98	42.00	2.50	43.00		44.00	3.48	45.00	3.98	46.00	4.48	47.00	5.00	48.00
	39"	39.00			1.46	42.00	1.98	43.00	2.50	44.00		45.00	3.48	46.00	3.98	47.00	4.48	48.00	5.00	49.00

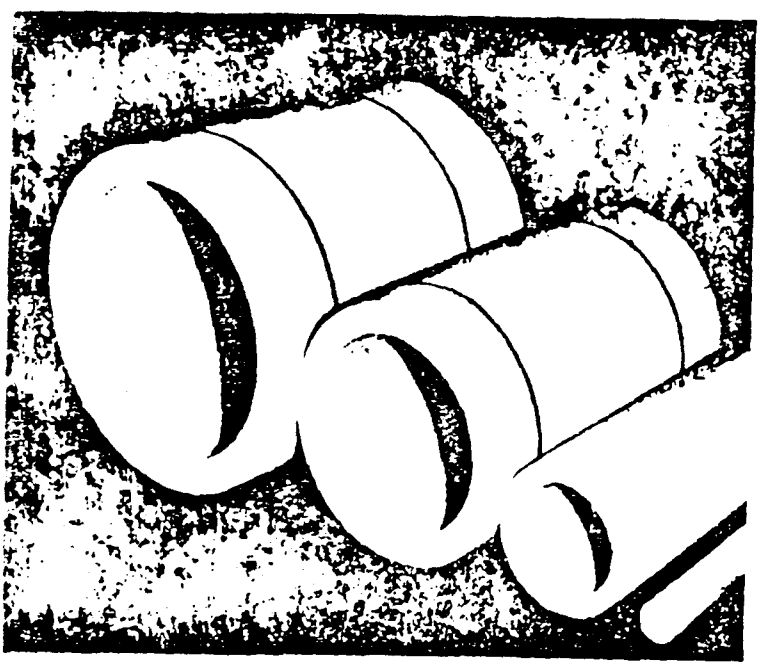
Note: Sizes above 3" available in multiple layers.

Insulation for the nominal pipe size range of 25"-39" is furnished to fit a range of 5 pipe sizes. The last segment applied must be cut to fit accurately.

COPPER TUBING

nom. tube size	O.D. of tube (nom.)	single layer: nom. 1" actual	nom. 1" O.D.	nom. 1¼ actual	nom. 1¼ O.D.
¼"	½"	.40	.86	1.49	3.00
⅜"	⅝"	1.11	2.88	1.42	3.50
½"	¾"	1.05	2.88	1.61	4.00
¾"	⅞"	.95	2.88	1.55	4.00
1"	1⅛"	.97	3.50	1.42	4.00
1¼"	1⅜"	.95	3.50	1.55	4.50
1½"	1⅝"	1.07	4.00	1.53	4.50
2"	2⅛"	.97	4.00	1.53	5.00
2½"	2⅝"	.98	4.50	1.58	5.56
3"	3⅛"	.99	5.00	1.57	5.56

KAYLO pipe insulation



note:

high temperature insulation for indoor or outdoor piping up to 1200 F operating temperature

(for temperatures ranging from 1200 F to 1800 F, see Kaylo-20, page 26)

Kaylo* pipe insulation, a near white, rigid hydrous calcium silicate heat insulation, manufactured by Owens-Corning Fiberglas Corporation, effectively insulates indoor and outdoor piping to 1200 F. A chemically reacted material, Kaylo pipe insulation contains no added binder. For mechanical effects, a small amount of asbestos fiber is included at the time of manufacture.

This thoroughly tested and field-proven material contains the physical properties most desired for efficient, durable insulation work. It retains an appreciable percentage of its strength even after complete saturation in water, original efficiency returning after drying. The effectiveness, high strength and moisture resistance are unattained by most other insulating materials.



Kaylo Pipe Insulation presents a superior final appearance when applied to a variety of irregularly-shaped high temperature vessels.

sizes

thickness- Kaylo Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes Kaylo Pipe Insulation is available to fit pipe from ½" to 30" in diameter. Kaylo Tube Insulation will fit copper tubing from ½" to 3⅛" in diameter.

forms - Kaylo Pipe Insulation is available in sectional or multisegmental form depending upon pipe size. All insulation is furnished in 3 ft. sections.

jackets

canvas- Kaylo Sectional Pipe Insulation includes standard canvas jackets, at no additional charge, on thicknesses up to and including 2½". Standard canvas is available for segmental forms at a slight additional cost. Bands are available for use with this product at slight additional charge and will be furnished on request.

Duck and Sisalkraft canvas jackets are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms, they are furnished but not adhered.

limitations

Kaylo Pipe Insulation is designed for temperatures up to 1200 F and is not recommended when operating temperatures of piping exceed this limit.

*T.M. Owens Corning Fiberglas Corp.

physical properties

density approximately 11 lb per cu ft

flexural strength (ASTM C 203) over 50 lb per sq in

compressive strength (at 5% deformation)

before heating (ASTM C 165) 150 lb per sq in

after heating for 24 hours

at 750 F	144 lb per sq in.
at 1000 F	123 lb per sq in
at 1200 F	117 lb per sq in

after boiling for 24 hours (while wet) 74 lb per sq in.

resistance to abrasion

(conventional tumbling test loss in weight after 10 min.)

before heating	9%
after heating for 24 hours	
at 750 F	5%
at 1000 F	4%
at 1200 F	3%

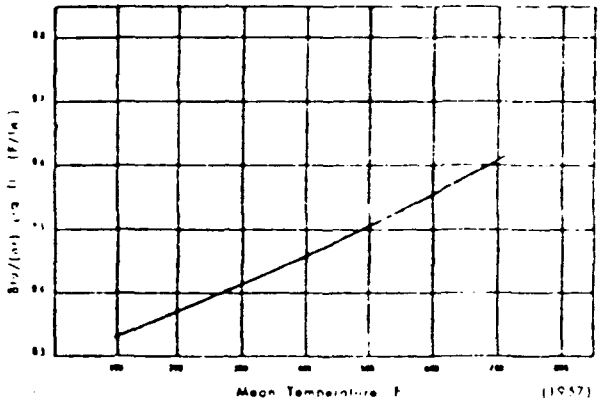
alkalinity: ph 10

dimensional stability

linear shrinkage after heating for 24 hours in muffle

at 750 F	0.8%
at 1000 F	0.9%
at 1200 F	1.4%

thermal conductivity





ease of application

Kaylo Pipe Insulation applies easily and quickly with standard application methods

specifications

for insulation of piping with Kaylo and Kaylo-20 pipe insulation

specification compliance

HH-I-523a Insulation Block, Pipe Covering and Cement, Thermal, Calcium Silicate (For Temperatures up to 1200 F) class 2

MIL-I-2781B Insulation Pipe Covering, Thermal

1. Insulating materials

All heated pipes shall be insulated with Kaylo Pipe Insulation as manufactured by Owens-Corning Fiberglas Corporation, to the thickness noted on drawings or as shown in the table.

2. Application

All Pipe Insulation shall be applied over clean, dry surfaces, butting adjoining sections firmly together. Insulation on pipes under 12" diameter shall have factory-applied canvas pasted neatly in place.

Insulation on pipes over 12" diameter and all outdoor piping shall be wired in place with 16 gauge soft annealed wire on no greater than 9" centers. Where double layer insulation is applied, the first layer shall be wired in place without jacket; the second layer shall be applied with all joints staggered.

All flanges, valves and fittings shall be insulated with fabricated mitered segments of pipe insulation equal in thickness to the insulation on the adjoining pipe. Fittings on pipe size of 3" and smaller may be insulated with O-C 110 Insulating Cement of equal thickness.

3 Surface finish

Indoor piping under 12" diameter not subject to abrasion or mechanical abuse requires no finish in addition to the factory-furnished canvas. Piping over 12" diameter shall be finished with 6-ounce canvas pasted in place.

Piping located outdoors shall be finished with 45-lb roofing felt jacket with all joints lapped not less than 2". Jackets shall be wired with 16 ga. copper wire on not greater than 9" centers or banded on 12" centers with [illegible] galvanized bands. Other suitable weatherproof jackets such as metal, asphalt or plastic coating may be applied according to the jacket manufacturers' specifications.

Insulation on flanges, valves and fittings shall be covered with a ⅛" coat of O-C 110 Insulation Cement. Insulation located indoors shall be further finished with canvas neatly pasted in place.

All insulation on flanges, valves and fittings located outdoors shall be covered with asphalt weatherproof mastic reinforced with an open mesh glass [illegible]. Mastic shall be applied in sufficient thickness to give a ⅛" dry coat and shall be troweled neatly over the fitting with the jacket on the adjacent pipe insulation lapped at least 2" over the mastic.

The foregoing is necessarily general in nature. Ap- [illegible]

FIBERGLAS

KAYLO-20 pipe insulation



Kaylo®-20 Insulation, colored pink for identification, a high-temperature calcium silicate heat insulation manufactured by Owens-Corning Fiberglas extends the range of Kaylo Heat Insulation to include temperatures up to 1800 F with all the properties of moisture resistance and high strength of standard Kaylo material. It also may be used with outer layers of Fiberglas Pipe Insulation to provide ultimate balance of cost and efficiency.

Kaylo-20 Insulation is highly dimensionally stable at the temperatures for which it is designed. Resistance of this insulation to high temperatures makes it extremely useful for protecting fluids in the pipe in case of fire.

sizes

thickness—Kaylo-20 Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo-20 Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes—Kaylo-20 Pipe Insulation is available to fit pipe from ½" to 39" in diameter. Kaylo-20 Tube Insulation in copper tubing sizes will fit tubing from ½" to 3⅛".

forms—Kaylo-20 Pipe Insulation is available in sectional or multi-segmental form depending upon pipe size. All insulation is furnished in 3' sections.

jackets

canvas—Standard canvas jackets are provided at no additional charge with Kaylo-20 Sectional Pipe and Tube Insulation on thicknesses up to and including 2½". Standard canvas is available for special forms at a slight additional cost. Bands are available for use with this product at a small additional charge and will be shipped only on request.

6 oz. and 8 oz. canvas jackets are available on all types, sizes and thicknesses of Kaylo-20 Pipe Insulation at additional charge. These jackets are factory applied on sectional pipe and tube insulation. On multi-segmental insulation, they are furnished but not adhered.

limitations

Kaylo-20 material is designed for temperatures up to 1800 F. It should not be used where operating temperatures of piping exceed this limit.

Kaylo-20 products are presently available on a made-to-order basis only. Properties and characteristics have been determined from [illegible]. Data [illegible] conditions will [illegible] product [illegible] material [illegible]

[illegible] Owens-Corning Fiberglas Corp.

note:

high temperature insulation and fireproofing for indoor and outdoor piping up to 1800 F operating temperature

physical properties

density:
approximately 12 lbs. per cu. ft.

flexural strength: **(ASTM C-203)**
90 lbs. per sq. in.

compressive strength: (ASTM C-165)
130 lbs. per sq. in. at 5% deformation

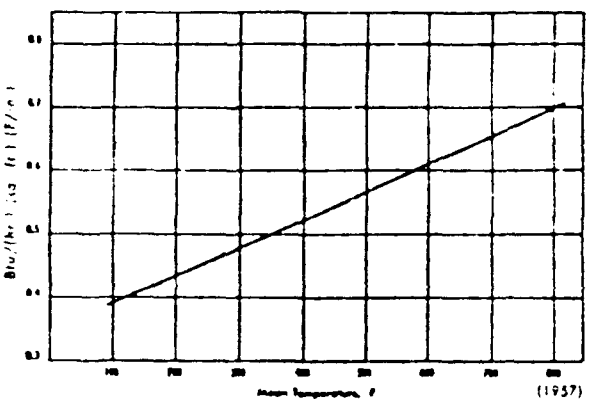
dimensional stability:
linear shrinkage after heating for 24 hours in muffle
at 1200 F 0.7%
at 1800 F 1.6%

resistance to abrasion:
(conventional tumbling test—loss in weight after 10 min.)
before heating 3%
after heating for 24 hours
at 1200 F 5%
at 1800 F 20%

alkalinity: ph 10

working temperature: up to 1800 F

thermal conductivity



recommended thicknesses

These are average figures and may be adjusted to meet actual conditions encountered on specific jobs. Kaylo heat loss data is available for use where plant operating economics and other conditions demand greater insulation thicknesses. Design surface temperatures are approx. 150 F.

nom. pipe size	Temperature Difference F							
	1100	1200	1300	1400	1500	1600	1700	1800
½	[illegible]	2½	3	3	3½	3½	4	4
¾	[illegible]	2½	3	3	3½	3½	4	4
1	2	3	3	3	3½	3½	4	4½
1¼	2	3	3	3½	3½	4	4½	4½
1½	3	3	3½	3½	3½	4	4½	
2	3	3	3½	3½	4	4	[illegible]	
2½	[illegible]	3½	3½	4	4	4½	[illegible]	[illegible]
3	[illegible]	3½	3½	4	4	4½	5	[illegible]
3½	3½	3½	4	4	4½	5	5½	[illegible]
4	[illegible]	3½	4	4	4½	5	5½	[illegible]
6	4	4	4½	4½	5	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	[illegible]	4½	[illegible]	[illegible]	[illegible]	[illegible]
10		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12		[illegible]						
14				[illegible]				
16								
18								
20								
24-72								

It's the low [illegible] that counts

Insulation thickness standards—
Kaylo and Kaylo-20

note:

prices for tubing sizes other than standard sizes shown are available on quotations from next larger size tube or pipe and will be slightly elliptical in shape

COPPER TUBING

nom. tube size	O. D. of tube (nom.)	single layer			
		nom. 1"		nom. 1	
		actual	O.D.	actual	O.D.
⅜"	½"	1.18	2.50	1	[illegible]
½"	⅝"	1.37	2.75	1	[illegible]
⅝"	¾"	1.05	2.88	1	[illegible]
¾"	⅞"	.90	2.88	1	4.00
1"	1⅛"	1.17	3.50	1	4.00
1¼"	1⅜"	1.05	3.50	1.55	4.25
1½"	1⅝"	1.17	4.00	1.42	4.25
2"	2⅛"	.91	4.00	1.31	5.00
2½"	2⅝"	.91	4.50	1.55	5.00
3"	3⅛"	.91	5.00	1.73	[illegible]

IRON PIPE SIZES

	nom. pipe size	O.D. of pipe	single layer only				single or double layer						multiple layer—recommended combinations											
			nom. 1"		nom. 1¼		nom. 2		nom. 2½"		nom. 3		2"		2½"		3"		3½"		4"		4½"	
			actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	IL	OL	IL	OL	IL	OL	IL	OL	IL	OL	IL	OL
Sectional	⅓"	.84	1.00	2.88	1.50	4.00	2.00	5.00	2.89	5.00	3.33	5.00	[illegible]											
	⅜"	1.05	.90	2.88	1.40	[illegible]	1.[illegible]	.00	2.[illegible]	6.00	3.[illegible]	[illegible]												
	1"	1.32	1.08	1.50	1.38	1.[illegible]	[illegible]	.56	[illegible]	6.88	[illegible]	[illegible]												
	1¼"	1.66	.90	6.51	[illegible]	[illegible]	2.[illegible]	5.56	2.88	7.88	2.98	[illegible]												
	1½"	1.90	1.03	3.00	1.73	[illegible]	[illegible]	[illegible]	[illegible]	7.63	[illegible]	[illegible]												
	2"	2.38	1.01	4.50	1.57	5.56	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	2½"	2.88	1.01	5.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8.88	[illegible]	[illegible]												
	3"	3.80	1.00	5.56	1.55	[illegible]	[illegible]	[illegible]	2.55	9.00	3.05	[illegible]												
	3½"	4.00	1.30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.83	[illegible]	[illegible]	[illegible]												
	4"	4.50	1.05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.55	[illegible]	[illegible]	[illegible]												
	4½"	5.00	1.30	7.00	1.83	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	5"	5.56	1.02	7.00	1.52	[illegible]	[illegible]	[illegible]	2.50	[illegible]	[illegible]	[illegible]												
	6"	6.63	.95	[illegible]	1.45	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	7"	7.63			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	8"	8.63			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
Tri-Segmental	9"	9.63			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	10"	10.75			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	11"	11.75			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	12"	12.75			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	14"	14.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	15"	15.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	16"	16.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	17"	17.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	18"	18.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	19"	19.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	20"	20.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	21"	21.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	22"	22.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	23"	23.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
Quad Seg.	24"	24.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	25"	25.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	26"	26.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	27"	27.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	28"	28.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	29"	29.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
K-Segmental	30"	30.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	31"	31.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	32"	32.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	33"	33.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	34"	34.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	35"	35.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	36"	36.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	37"	37.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	38"	38.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
	39"	39.00			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												

OWENS-CORNING FIBERGLAS CORPORATION

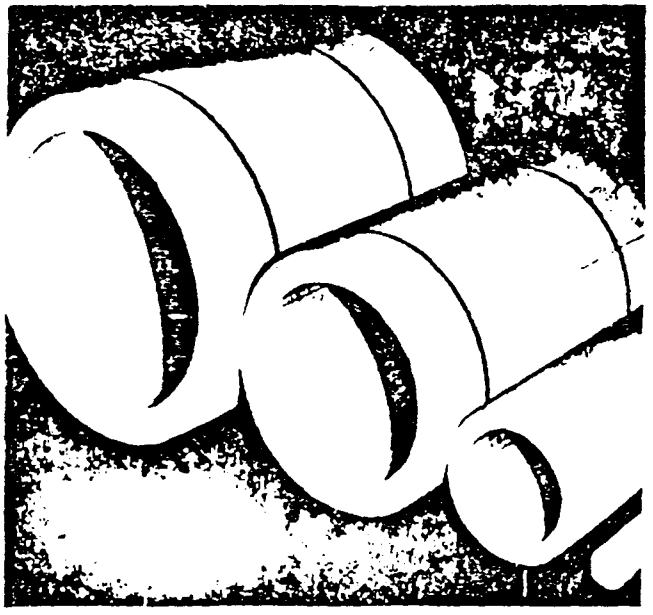
Industrial and Commercial Construction Materials Division 717 Fifth Avenue New York 22, N.Y.

General Offices: Toledo 1, Ohio Pacific Coast Division: Santa Clara, Ca.

Product Data

Kaylo and Kaylo-20 Pipe Insulation

KAYLO pipe insulation *for indoor or outdoor piping up to 1200 F operating temperature*



Kaylo pipe insulation applies easily and quickly with standard application methods. Ordinary tools of the trade are sufficient for all cutting, sawing or scoring. It is non-irritating to the skin.



Kaylo Pipe Insulation presents a superior final appearance when applied to a variety of irregularly shaped high temperature vessels.

Kaylo* pipe insulation, a near white, rigid hydrous calcium silicate heat insulation, manufactured by Owens-Corning Fiberglas Corporation, effectively insulates indoor and outdoor piping to 1200 F. A chemically reacted material, Kaylo pipe insulation contains no added binder. For mechanical effects, a small amount of asbestos fiber is included at the time of manufacture.

This thoroughly tested and field-proven material contains the physical properties most desired for efficient, durable insulation work. It retains an appreciable percentage of its strength even after complete saturation in water, original efficiency returning after drying. The effectiveness, high strength and moisture resistance are unattained by most other insulating materials.

sizes

thickness—Kaylo Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes—Kaylo Pipe Insulation is available to fit pipe from ½" to 30" in diameter. Kaylo Tube Insulation will fit copper tubing from ½" to 3⅛" in diameter.

forms—Kaylo Pipe Insulation is available in sectional or multisegmental form depending upon pipe size. All insulation is furnished in 3 ft. sections.

jackets

canvas—Kaylo Sectional Pipe Insulation includes standard canvas jackets, at no additional charge, on thicknesses up to and including 2½". Standard canvas is available for segmental forms at a slight additional cost. Bands are available for use with this product at slight additional charge and will be furnished on request.

Standard canvas jackets are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms, they are furnished but not adhered.

Kaylo Klad—Kaylo is also available with a soft rippled embossed aluminum jacket .016" thick or .010 stainless steel jacket. These jackets provide greater resistance to mechanical damage and present a neat finished appearance to pipe lines. The longitudinal seam has a self-locking joint. Joint bands with integral mastic are furnished for sealing end joints.

limitations

Kaylo Pipe Insulation is designed for temperatures up to 1200 F and is not recommended when operating temperatures of piping exceed this limit.

KAYLO AND KAYLO-20 PIPE INSULATION FIBERGLAS

physical properties

density ..... approximately 11 lb. per cu. ft.

flexural strength ..... (ASTM C-203) over 50 lb. per sq. in.

compressive strength ..... 100 psi @ 5% deformation, ASTMC-165 modified

resistance to abrasion

(conventional tumbling test-loss in weight after 10 min.)

before heating 9%

after heating for 24 hours

at 750 F 5%

at 1000 F 4%

at 1200 F 3%

alkalinity: ph 10

corrosion: Kaylo does not cause or accelerate corrosion of steel, aluminum, or stainless steel

dimensional stability

linear shrinkage after heating for 24 hours in muffle

at 750 F 0.8%

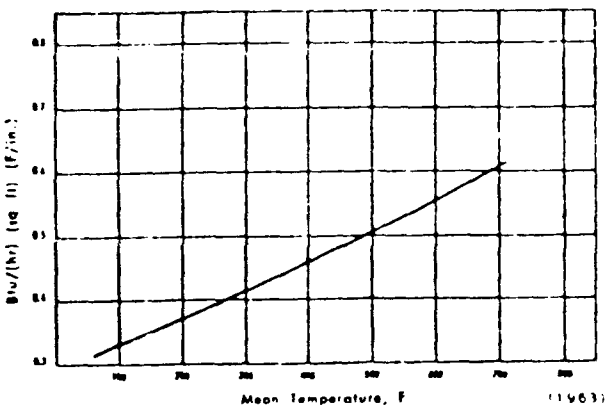
at 1000 F 0.9%

at 1200 F 1.4%

specific heat 0.22 Btu/lb.F

thermal diffusivity 0.012 sq. ft. per hr. at 700 F. mean temperature

thermal conductivity



contains stress corrosion inhibitor

Ordinary construction grades austenitic of stainless steel are quite vulnerable to rapid deterioration by stress-corrosion cracking. This attack is caused by trace quantities of chlorides which are present in most industrial waters, industrial atmospheres and in all insulations.

Kaylo and Fiberglas have one of the lowest chloride contents of all commercially available insulations.

Now, as an added feature, Kaylo is being formulated with a stress corrosion inhibitor to protect expensive stainless steel piping and equipment from stress corrosion failure from the outside. This inhibitor has been field proven by years of experience in a variety of critical stainless steel applications. Kaylo, with the inhibitor added, has passed a very extensive series of laboratory stress corrosion tests (based on the DuPont test procedure).

The low chloride content of Kaylo plus the use of inhibitor make Kaylo the logical choice for insulating stainless steel piping and equipment.

specifications

for insulation of piping with Kaylo

applicable specifications

HH-I-523a *Insulation Block, Pipe Covering and Cement, Thermal, Calcium Silicate* (For Temperatures up to 1200 F) class II (pipe covering).

MIL-I-2781D *Insulation Pipe Covering, Thermal*

Grade 1, Class B; Grade 2, Class D;
Grade 3, Class E

1. Insulating materials

All heated pipes shall be insulated with Kaylo Pipe Insulation as manufactured by Owens-Corning Fiberglas Corporation, to the thickness noted on drawings or as shown in the table.

The insulation shall have a maximum shrinkage of 1.4% after 24 hr. heat soak @ 1200F. The insulation shall be certified safe for stainless steel applications. The maximum density shall be 12 pcf.

2. Application

All Pipe Insulation shall be applied over clean, dry surfaces, butting adjoining sections firmly together and adhered canvas, when furnished, smoothly over joints. Longitudinal and circumferential joints need not be pointed with finishing cement to conserve heat.

Insulation on pipes over 12" diameter and all outdoor piping shall be wired in place with 16 gauge soft annealed wire on no greater than 9" centers. Where double layer insulation is applied, the first layer shall be wired in place without jacket; the second layer shall be applied with all joints staggered.

All flanges, valves and fittings shall be insulated with Fiberglas molded fitting insulation or fabricated mitered segments of pipe insulation equal in thickness to the insulation on the adjoining pipe. Fittings on pipe sizes 3" and smaller may be insulated with O-C 110 Insulating Cement of equal thickness.

3. Surface finish

Indoor piping under 12" diameter not subject to abrasion or mechanical abuse requires no finish in addition to the factory-furnished canvas. Piping over 12" diameter shall be finished with 6-ounce canvas adhered with Sealfas Mastic.

Piping located outdoors shall be finished with 45-lb. roofing felt jacket with all joints lapped not less than 2". Jackets shall be wired with 16 ga. copper wire on not greater than 9" centers or banded on 12" centers with ½" galvanized bands. Other suitable weatherproof jackets such as metal, asphalt or plastic coating may be applied according to the jacket manufacturers' specifications.

Insulation on flanges, valves and fittings shall be covered with a ¼" coat of O-C 110 Insulation Cement. Insulation located indoors shall be further finished with 6 oz. canvas neatly adhered with Sealfas Mastic.

All insulation on flanges, valves and fittings located outdoors shall be covered with asphalt weatherproof mastic, such as BF 90-07, reinforced with an open mesh glass fabric. Mastic shall be applied in sufficient thickness to give a ⅛" dry coat and shall be troweled neatly over the fitting with the jacket on the adjacent pipe insulation lapped at least 2" over the mastic.

The foregoing is necessarily general in nature. Application procedure and material approval is at the discretion and responsibility of the design engineer to meet specific [illegible]

design data for Kaylo Insulations

This table presents reference data for information on the actual thicknesses according to the simplified Dimensional Standard system.

The following data are presented to aid in the design of Kaylo Pipe Insulation modified to meet specific needs. Recommendations are generalized and should be modified to meet local conditions and job requirements.

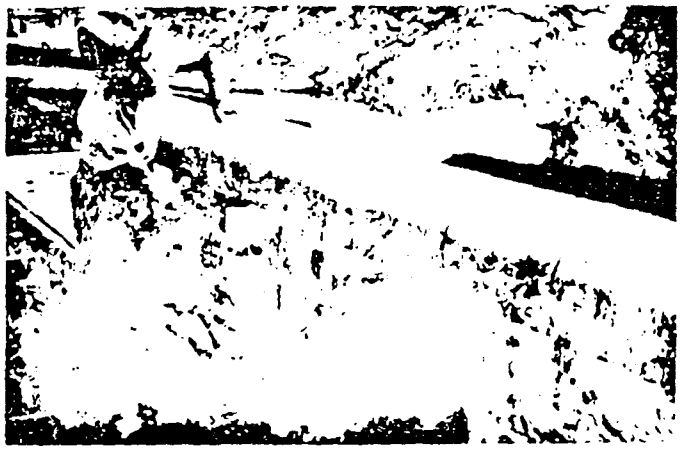
importance of calculating economic thickness

Selection of insulation thicknesses for any specific application should take into consideration at least the following criteria.

1. Cost of insulation applied
2. Cost of heat energy
3. Cost of capital
4. Depreciation period—plant and insulation
5. Capital investment in heat production equipment
6. Temperature differential
7. Size of the pipe or surface
8. Conductivity of insulation

To assist the engineer, Owens-Corning Fiberglas has taken the figures provided by the National Insulation Manufacturers Association in their manual, "How to Determine Economic Thickness of Insulation" and, by pre-calculating many of the equations on a computer, has created a quick, simple system for resolving economic thickness. To obtain your copy of this Dividend Engineering "Economic Thickness Manual," contact your local Fiberglas branch office. Your local Fiberglas representative will be glad to explain this quick, practical method for computing economical thickness under all normal operating conditions.

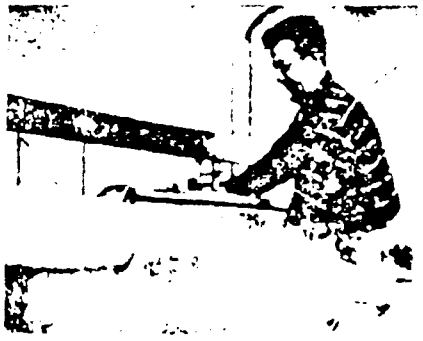
applications—Kaylo and Kaylo-Klad



Off-site yard steam insulated with Kaylo Pipe Insulation for efficiency and controlled temperatures at distant points.







Kaylo Klad
Stainless steel and aluminum clad Kaylo Pipe Insulations apply quickly to piping. A self locking longitudinal seam and end joint strips make application of insulation and weather protection a "one-step" operation. The neat finished appearance "dresses up" the line and provides a virtually maintenance free weather protection.



Kaylo-Klad aluminum jacket "locks [illegible] the weather. The longitudinal seam [illegible] and end [illegible] with integral mastic, provide [illegible] weather [illegible].

economic thicknesses—Kaylo

temp. diff.		100 F			200 F			300 F		
	pipe size	E.T.	S.T.	H.L.	E.T.	S.T.	H.L.	E.T.	S.T.	H.L.
C	½"	1	92	16	1½	95	27	2	98	38
	¾"	1	94	18	1½	97	31	2	100	43
	1"	1	92	20	1½	96	34	2	99	46
	1¼"	1	93	25	1½	96	38	2	103	54
	1½"	1	93	25	1½	99	43	2	98	54
	2"	1	94	29	1½	99	48	2	102	64
	2½"	1	94	33	1½	96	50	2½	96	61
	3"	1	95	39	2	95	54	2½	100	74
	3½"	1½	89	30	2	94	55	2½	98	76
	4"	1½	90	33	2	96	64	2½	101	87
	4½"	1½	90	37	2	96	64	2½	100	87
	5"	1½	91	44	2	97	75	2½	101	100
	6"	1½	92	51	2½	94	74	3	99	102
	7"	1½	92	56	2½	94	82	3	99	110
	8"	1½	92	62	2½	94	87	3½	96	109
	9"	1½	92	67	2½	94	95	3½	97	118
	10"	2	89	59	2½	94	105	3½	97	130
	12"	2	90	68	3	92	106	4	95	135
	14"	2	90	78	3	93	118	4	96	148
	16"	2½	88	73	3	93	132	4	96	165
	18"	2½	88	81	3	94	146	4	96	182
	20"	2½	88	89	3	94	160	4	97	198
	24"	2½	88	104	3	94	188	4½	95	211
	30"	2½	88	118	3½	92	177	5	93	204

KEY

(ambient still air at 70 F)

ET = Economic Thickness (in.)

ST = Surface Temperature * (F)

HL = Heat Loss Btu/Lin. ft./hr.

*Surface temperatures for Kaylo-Klad will be higher due to the emissivity of the aluminum jacket. This will vary with ambient temperature thickness of insulation used. However, the thermal efficiency of the application will be improved slightly by the aluminum jacket.

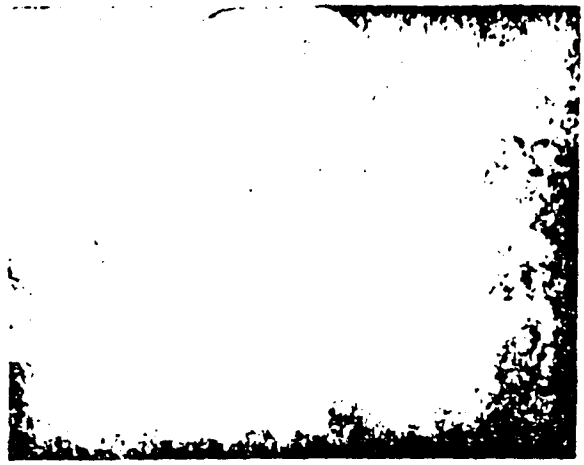
C = Commercial and Industrial

U = Power and Utility

P = Process Industries

temp. diff.		200 F			400 F			600 F			800 F			1000 F		
	pipe size	E.T.	S.T.	H.L.	E.T.	S.T.	H.L.	E.T.	S.T.	H.L.	E.T.	S.T.	H.L.	E.T.	S.T.	H.L.
U	½"	1	105	32	1	136	71	1½	124	94	2	137	119	2	157	158
	¾"	1	110	39	1	148	84	1½	142	108	2	145	135	2½	136	154
	1"	1	105	41	1½	118	73	2	123	103	2	143	147	2½	143	175
	1¼"	1	112	52	1½	119	82	2	130	121	2	154	173	2½	153	203
	1½"	1	109	53	1½	123	92	2	121	121	2	141	169	2½	143	204
	2"	1	110	61	1½	125	105	2	130	143	2½	137	182	3	141	220
	2½"	1	111	70	1½	118	108	2½	116	136	2½	134	193	3	138	235
	3"	1	113	76	2	116	116	2½	124	164	3	133	210	3½	136	253
	3½"	1½	98	64	2	113	119	2½	120	169	3	128	216	3½	138	264
	4"	1½	102	77	2	118	139	2½	126	194	3	134	244	3½	140	295
	4½"	1½	98	85	2	113	151	2½	120	210	3	128	260	3½	138	304
	5"	1½	104	91	2	120	164	3	121	199	3½	129	256	4	138	310
	6"	1½	105	107	2	121	185	3	121	227	3½	129	286	4	136	348
	7"	1½	105	116	2	121	206	3	121	244	3½	131	314	4	136	383
	8"	1½	104	129	2½	112	188	3	121	268	3½	132	343	4½	130	387
	9"	2	98	110	2½	113	206	3½	118	262	4	127	340	4½	133	410
	10"	2	98	123	2½	114	228	3½	118	288	4	128	373	4½	135	457
	12"	2	100	142	2½	115	262	3½	119	330	4	130	426	5	131	483
	14"	2	100	162	2½	118	294	3½	121	366	4	132	470	5	133	527
	16"	2	101	182	3	112	286	4	116	368	4½	127	477	5½	129	535
	18"	2	101	202	3	112	316	4	117	404	4½	128	525	5½	130	570
	20"	2	101	222	3	112	346	4	117	442	4½	128	578	5½	131	626
	24"	2	101	262	3	113	407	4	118	517	4½	129	666	5½	132	721
	30"	2	101	370	3	113	490	4	118	617	5	125	650	6	128	770
P	½"	1	105	32	1	136	71	1	120	99	1	212	146	1½	185	160
	¾"	1	110	39	1	148	84	1	134	117	1	236	170	1½	200	190
	1"	1	105	41	1	139	89	1½	124	124	1½	215	180	1½	196	205
	1¼"	1	112	52	1	154	114	1½	139	156	1½	239	167	1½	196	230
	1½"	1	109	53	1	146	115	1½	182	159	1½	180	190	1½	210	255
	2"	1	110	61	1	149	133	1½	149	169	1½	182	210	2	176	271
	2½"	1	111	70	1	151	152	1½	140	136	1½	167	248	2	168	286
	3"	1	113	76	1	156	184	1½	156	223	2	163	266	2	188	354
	3½"	1	107	83	1½	123	138	1½	147	223	2	155	271	2½	159	319
	4"	1	112	98	1½	131	166	1½	159	268	2	167	317	2½	170	366
	4½"	1	114	103	1½	133	180	1½	163	290	2	170	350	2½	173	394
	5"	1	115	120	1½	135	199	1½	165	320	2	171	374	2½	175	422
	6"	1	117	151	1½	137	232	1½	169	374	2	175	424	2½	178	484
	7"	1½	105	116	1½	137	252	2	146	332	2½	154	405	3	160	461
	8"	1½	104	129	1½	137	280	2	146	366	2½	154	431	3	160	505
	9"	1½	104	142	1½	136	307	2	146	384	2½	156	470	3	162	550
	10"	1½	104	151	1½	135	328	2	146	430	2½	158	521	3	166	608
	12"	1½	104	174	1½	136	380	2	153	496	2½	161	600	3	168	697
	14"	1½	107	202	2	137	431	2	159	474	2½	167	675	3	174	777
	16"	1½	108	228	2	138	494	2	161	537	2½	168	756	3½	163	770
	18"	1½	108	253	2	138	494	2	161	537	2½	168	775	3½	163	850
	20"	1½	108	279	2	138	494	2	161	537	2½	168	794	3½	163	929
	24"	1½	108	331	2	138	494	2	161	537	2½	168	832	3½	163	1087
	30"	1½	108	410	2	138	494	2	161	537	2½	168	890	4	158	334

KAYLO-20 pipe insulation *for indoor and outdoor piping up to 1800 F operating temperature*



Kaylo-20® Insulation, colored pink for identification, a high-temperature calcium silicate heat insulation manufactured by Owens-Corning Fiberglas extends the range of Kaylo Heat Insulation to include temperatures up to 1800 F with all the properties of moisture resistance and high strength of standard Kaylo material. It also may be used with outer layers of Fiberglas Pipe Insulation to provide ultimate balance of cost and efficiency.

Kaylo-20 Insulation is highly dimensionally stable at the temperatures for which it is designed. Resistance of this insulation to high temperatures makes it extremely useful for protecting fluids in the pipe in case of fire.

sizes

thickness—Kaylo-20 Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo-20 Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes—Kaylo-20 Pipe Insulation is available to fit pipe from ½" to 39" in diameter. Kaylo-20 Tube Insulation in copper tubing sizes will fit tubing from ½" to 3⅛".

forms—Kaylo-20 Pipe Insulation is available in sectional or multi-segmental form depending upon pipe size. All insulation is furnished in 3' sections.

jackets

canvas—Standard canvas jackets are provided at no additional charge with Kaylo-20 Sectional Pipe and Tube Insulation on thicknesses up to and including 2½". Standard canvas is available for segmental forms at a slight additional cost. Bands are available for use with this product at a small additional charge and will be shipped only on request.

6 oz. and 8 oz. canvas jackets are available on all types, sizes and thicknesses of Kaylo-20 Pipe Insulation at additional charge. These jackets are factory applied on sectional pipe and tube insulation. On multi-segmental insulation, they are furnished but not adhered.

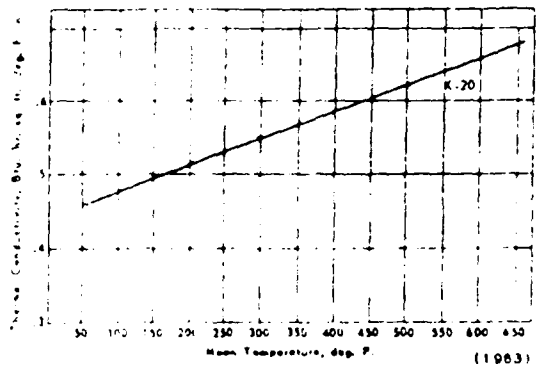
Kaylo Klad locks out the weather, protects the insulation and provides a maintenance free line and attractive finished appearance. Factory applied jackets of .016 embossed aluminum and .010 stainless steel have longitudinal interlocking seams and joint bands with integral gasket permitting application of insulation and weather proofing at the same time and reducing application costs.

limitations

physical properties

density:
approximately 12 lbs. per cu. ft.
flexural strength: (ASTM C-203)
90 lbs. per sq. in.
compressive strength: (ASTM C-165)
130 lbs. per sq. in. at 5% deformation
dimensional stability:
linear shrinkage after heating for 24 hours in muffle
at 1200 F 0.7%
at 1800 F 1.6%
resistance to abrasion:
(conventional tumbling test—loss in weight after 10 min.)
before heating 3%
after heating for 24 hours
at 1200 F 5%
at 1800 F 20%
alkalinity: ph 10
working temperature: up to 1800 F
physical properties
specific heat 0.22 Btu/1 lbs. F.
thermal diffusivity. 0.016 sq. ft. per hr. at 200 F mean temperature.

thermal conductivity



recommended thicknesses†

These are average figures and may be adjusted to meet special conditions encountered on specific jobs. Kaylo heat loss data is available for use where plant operating economics and other conditions demand greater insulation thicknesses. Design surface temperatures are approx. 150 F.

Temperature Difference F (Ambient still air at 70F)

pipe size	200			400			800			1200			1400		
	E.T.	S.T.	H.L.	E.T.	S.T.	H.L.	E.T.	S.T.	H.L.	E.T.	S.T.	H.L.	E.T.	S.T.	H.L.
½	1	114	37	1	156	84	1	248	186	1½	251	264	2	210	300
¾	1	120	44	1	170	99	1	276	217	1½	275	301	2	226	336
1"	1	115	47	1	158	105	1	251	232	1½	268	327	2	223	362
1¼	1	123	58	1	177	131	1½	195	222	2	239	322	2	249	428
1½"	1	119	60	1	167	134	1½	208	247	2	211	336	2	223	435
2	1	121	70	1	170	156	1½	212	283	2	237	402	2½	208	454
2½	1	121	80	1	173	179	2	168	260	2½	197	390	2½	201	493
3	1	124	90	1½	147	166	2	188	318	2½	220	467	2½	221	580
3½"	1	115	100	1½	137	180	2	178	350	2½	225	500	3	190	556
4"	1	123	111	1½	148	200	2	193	377	2½	227	548	3	206	629
4½	1	125	123	1½	150	221	2	195	391	2½	230	610	3	197	645
5"	1	128	135	1½	153	245	2	198	502	3	211	601	3	211	716
6"	1	129	163	1½	156	282	2	202	513	3	212	652	3	218	815
7"	1½	113	140	1½	156	311	2½	175	501	3½	190	653	3½	195	808
8	1½	113	151	1½	155	341	2½	176	519	3½	192	697	3½	196	865
9	1½	113	163	2	135	314	3	164	528	3½	200	767	4	182	867
10	1½	113	176	2	137	328	3	166	561	3½	201	837	4	187	949
12	1½	113	204	2	142	408	3	168	646	3½	204	958	4	190	080
14	1½	113	247	2	143	43[illegible]	3	171	7[illegible]8	4	193	96[illegible]	4	196	[illegible]95
16	1½	113	274	2	144	[illegible]	3	175	806	4	196	1075	4	198	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	694	4	1173	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9[illegible]	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

insulation thickness standards— Kaylo and Kaylo-20

nom. tube size	O.D. of tube (nom.)	single layer nom. 1" actual	nom. 1" O.D.	single layer nom. 1½" actual	nom. 1½" O.D.
⅛"	¼"	1.18	2.88	1.49	3.50
¼"	⅜"	1.31	2.88	1.62	3.50
⅜"	½"	1.15	2.88	1.61	4.00
½"	⅝"	.99	2.88	.99	4.00
¾"	⅞"	1.16	3.50	1.62	4.00
1"	1⅛"	1.05	3.50	1.55	4.50
1¼"	1⅜"	1.17	4.00	1.42	4.50
1½"	1⅝"	.91	4.00	1.41	5.00
2"	2⅛"	.91	4.50	1.35	5.56
2½"	2⅝"	.91	5.00	1.73	6.66
3"	3⅛"	.81	5.00	1.73	6.66

Federal Specification Compliance

HH-I-523a Insulation Block Pipe Covering and Cement, Thermal, Calcium Silicate (For Temperatures up to 1200° F) class II (pipe covering).

MIL-I-2781D Insulation Pipe Covering, Thermal, Grade I Class B, Grade II Class D, Grade III Class E.

For Applicable Specifications refer to Page 2.

note:

Insulations for tubing sizes other than standard sizes shown are available only as cut-downs from next larger size tube or pipe and will be slightly elliptical in shape.

KEY

IP = Iron pipe sizes

CT = copper tubing

IL = Inner Layer

OL = Outer Layer

nom. pipe size	O.D. of pipe	single layer only: nom. 1" actual	nom. 1" O.D.	nom. 1½" actual	nom. 1½" O.D.	single or double layer: nom. 2" actual	nom. 2" O.D.	nom. 2½" actual	nom. 2½" O.D.	nom. 3" actual	nom. 3" O.D.	multiple layer—recommended combinations: 2" IL/OL	2½" IL/OL	3" IL/OL	3½" IL/OL	4" IL/OL	4½" IL/OL	5" IL/OL	6" IL/OL
⅛"	.84	1.00	2.88	1.56	4.00	2.06	5.00	2.89	6.66	3.39	7.66								
¼"	1.05	.90	2.88	1.46	4.00	1.96	5.00	2.79	6.66	3.29	7.66								
⅜"	1.32	1.08	3.50	1.58	4.50	2.11	5.56	2.68	6.66	3.16	7.66								
1"	1.66	.90	3.50	1.66	5.00	1.94	5.56	2.48	6.66	2.98	7.66								
1¼"	1.90	1.03	4.00	1.53	5.00	2.36	6.66	2.86	7.66	3.36	8.66								
1½"	2.38	1.01	4.50	1.57	5.56	2.12	6.66	2.62	7.66	3.12	8.66								
2"	2.88	1.04	5.00	1.87	6.66	2.37	7.66	2.87	8.66	3.37	9.66								
2½"	3.50	1.00	5.56	1.95	6.66	2.05	7.66	2.55	8.66	3.05	9.66								
3"	4.00	1.30	6.66	1.80	7.66	2.30	8.66	2.80	9.66	3.36	10.78								
4"	4.50	1.05	6.66	1.55	7.66	2.05	8.66	2.55	9.66	3.11	10.78								
4½"	5.00	1.30	7.66	1.80	8.66	2.30	9.66	2.86	10.78	3.36	11.78								
5"	5.56	1.02	7.66	1.52	8.66	2.02	9.66	2.58	10.78	3.08	11.78								
6"	6.63	.95	8.66	1.45	9.66	2.02	10.78	2.52	11.78	3.01	12.81								
7"	7.63			1.52	10.78	2.02	11.78	2.53	12.81	3.06	13.86								
8"	8.63			1.52	11.78	2.03	12.81	2.66	13.86	3.10	15.06								
9"	9.63			1.53	12.81	2.16	13.86	2.65	15.06	3.15	16.09								
10"	10.75			1.59	13.86	2.09	15.06	2.61	16.09	3.05	17.00								
11"	11.75			1.58	15.06	2.09	16.09	2.55	17.00	3.05	18.00								
12"	12.75			1.59	16.09	2.05	17.00	2.55	18.00	3.05	19.00								
14"	14.00			1.42	17.00	1.92	18.00	2.42	19.00	2.92	20.00								
15"	15.00			1.42	18.00	1.92	19.00	2.41	20.00	2.92	21.00								
16"	16.00			1.41	19.00	1.91	20.00	2.41	21.00	2.91	22.00								
17"	17.00			1.41	20.00	1.91	21.00	2.41	22.00	2.91	23.00								
18"	18.00			1.41	21.00	1.91	22.00	2.41	23.00	2.91	24.00								
19"	19.00			1.41	22.00	1.91	23.00	2.41	24.00	2.91	25.00								
20"	20.00			1.41	23.00	1.91	24.00	2.41	25.00	2.91	26.00								
21"	21.00			1.41	24.00	1.91	25.00	2.41	26.00	2.91	27.00								
22"	22.00			1.41	25.00	1.91	26.00	2.41	27.00	2.91	28.00								
23"	23.00			1.41	26.00	1.91	27.00	2.41	28.00	2.91	29.00								
24"	24.00			1.41	27.00	1.91	28.00	2.41	29.00	2.91	30.00								
25"	25.00			1.41	28.00	1.91	29.00	2.50	30.00	3.02	31.00								
26"	26.00			1.41	29.00	1.91	30.00	2.50	31.00	3.02	32.00								
27"	27.00			1.41	30.00	1.91	31.00	2.50	32.00	3.02	33.00								
28"	28.00			1.41	31.00	1.91	32.00	2.50	33.00	3.02	34.00								
29"	29.00			1.41	32.00	1.91	33.00	2.50	34.00	3.02	35.00								
30"	30.00			1.41	33.00	1.91	34.00	2.50	35.00	3.02	36.00								
31"	31.00			1.41	34.00	1.91	35.00	2.50	36.00	3.02	37.00								
32"	32.00			1.41	35.00	1.91	36.00	2.50	37.00	3.02	38.00								
33"	33.00			1.41	36.00	1.91	37.00	2.50	38.00	3.02	39.00								
34"	34.00			1.41	37.00	1.91	38.00	2.50	39.00	3.02	40.00								
35"	35.00			1.41	38.00	1.91	39.00	2.50	40.00	3.02	41.00								
36"	36.00			1.41	39.00	1.91	40.00	2.50	41.00	3.02	42.00								

Sectional

Tri-Segmental

IP

Our [illegible]



Where to buy

Available from authorized distributors located in principal cities. Consult the yellow pages of your classified directory for their location or call your nearest Fiberglas Branch Office listed below.

Albany, New York	438-6021
Albuquerque, New Mexico	243-4583
Anchorage, Alaska	275-8344
Atlanta, Georgia	355-6821
Baltimore, Md. (Washington)	587-0930
Billings, Montana	252-8496
Birmingham, Alabama	252-4184
Boise, Idaho	342-9311
Boston, Massachusetts	235-7540
Buffalo, New York	853-4123
Charleston, West Virginia	343-7094
Charlotte, North Carolina	334-6864
Chicago, Illinois	583-0100
Cincinnati, Ohio	281-1173
Cleveland, Ohio	621-6451
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Dallas, Texas	741-3982
Dayton, Ohio	293-3155
Denver, Colorado	244-2991
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Fresno, California	233-7227
Grand Rapids, Michigan	243-3697
Greensboro, North Carolina	299-3911
Greenville, South Carolina	239-4279
Harrisburg, Pennsylvania	761-0430
Hartford, Connecticut	247-1301
Honolulu, Hawaii	563-611
Houston, Texas	686-8426
Indianapolis, Indiana	898-1140
Jackson, Mississippi	948-3464
Jacksonville, Florida	387-2543
Kansas City, Missouri	753-7725
Knoxville, Tennessee	588-7655
Los Angeles, California	723-9781
Louisville, Kentucky	634-8384
Lubbock, Texas	744-0269
Memphis, Tennessee	327-6116
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Milwaukee, Wisconsin	344-3811
Minneapolis, Minnesota	377-1730
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Nashville, Tennessee	254-9210
Newark, New Jersey	484-2800
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Oakland, California	836-0262
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Omaha, Nebraska	393-7373
Peoria, Illinois	674-3232
Philadelphia, Pennsylvania	688-8650
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Portland, Oregon	226-3505
Providence, Rhode Island	725-0100
Raleigh, North Carolina	833-7716
Reno, Nevada	322-6941
Richmond, Virginia	355-5703
Rochester, New York	381-6670
Rock Island, Illinois	788-1190
Sacramento, California	927-1341
St Louis, Missouri	725-1061
Salt Lake City, Utah	359-5247
San Antonio, Texas	824-6171
San Bernardino, California	889-2277
San Diego, California	297-3751
San Francisco, California	861-4721
San Jose, California	297-9520
Seattle, Washington	622-4335
Spokane, Washington	535-3575
Syracuse, New York	476-7456
Tampa, Florida	247-2171
Toledo, Ohio	248-6741
Tucson, Arizona	623-5429
Washington, D. C	296-3296
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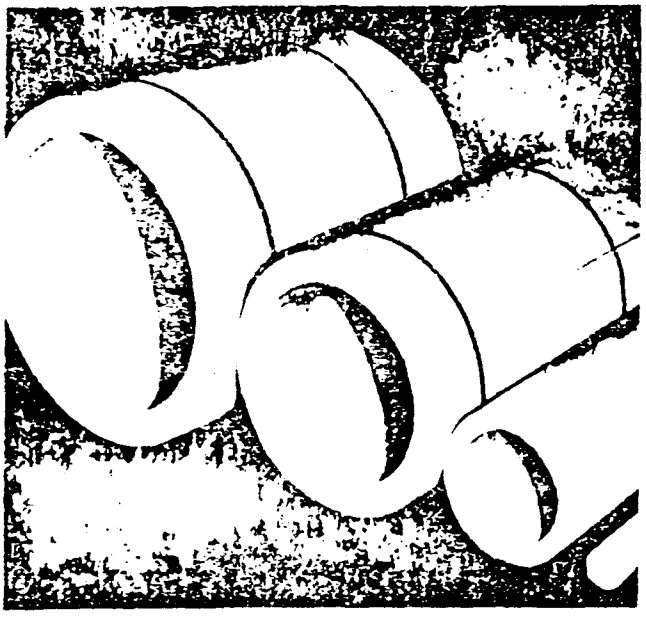
Product Data

Kaylo and Kaylo-20 Pipe Insulation

KAYLO pipe insulation *for indoor or outdoor piping up to 1200 F operating temperature*



Kaylo pipe insulation applies easily and quickly with standard application methods. Ordinary tools of the trade are sufficient for all cutting, sawing or scoring. It is non-irritating to the skin.



Kaylo Pipe Insulation presents a superior final appearance when applied to a variety of irregularly-shaped high temperature vessels.

Kaylo® pipe insulation, a near white, rigid hydrous calcium silicate heat insulation, manufactured by Owens-Corning Fiberglas Corporation, effectively insulates indoor and outdoor piping to 1200 F. A chemically reacted material, Kaylo pipe insulation contains no added binder. For mechanical effects, a small amount of asbestos fiber is included at the time of manufacture.

This thoroughly tested and field-proven material contains the physical properties most desired for efficient, durable insulation work. It retains an appreciable percentage of its strength even after complete saturation in water, original efficiency returning after drying. The effectiveness, high strength and moisture resistance are unattained by most other insulating materials.

sizes

thickness—Kaylo Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes—Kaylo Pipe Insulation is available to fit pipe from ½" to 39" in diameter. Kaylo Tube Insulation will fit copper tubing from ⅛" to 3⅛" in diameter.

forms—Kaylo Pipe Insulation is available in sectional or multisegmental form depending upon pipe size. All insulation is furnished in 3 ft. sections.

jackets

canvas—Kaylo Sectional Pipe Insulation includes standard canvas jackets, at no additional charge, on thicknesses up to and including 2½". Standard canvas is available for segmental forms at a slight additional cost. Bands are available for use with this product at slight additional charge and will be furnished on request.

6 oz. and 8 oz. canvas jackets are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms, they are furnished but not adhered.

Kaylo Klad—Kaylo is also available with a soft rippled embossed aluminum jacket .016" thick or .010 stainless steel jacket. These jackets provide greater resistance to mechanical damage and present a neat finished appearance to pipe lines. The longitudinal seam has a self locking joint. Joint bands with integral mastic are furnished for sealing end joints.

limitations

Kaylo Pipe Insulation is designed for temperatures up to 1200 F and is not recommended when operating temperatures of piping exceed this limit.

KAYLO AND KAYLO-20 PIPE INSULATION FIBERGLAS

Reg. U.S. Pat. Off. (Owens-Corning Fiberglas Corp.)

physical properties

density approximately 11 lb. per cu. ft.

flexural strength (ASTM C 203) over 50 lb. per sq. in.

resistance to abrasion

(conventional tumbling test loss in weight after 10 min.)

before heating	9%
after heating for 24 hours	
at 750 F	5%
at 1000 F	4%
at 1200 F	3%

alkalinity: ph 10

dimensional stability

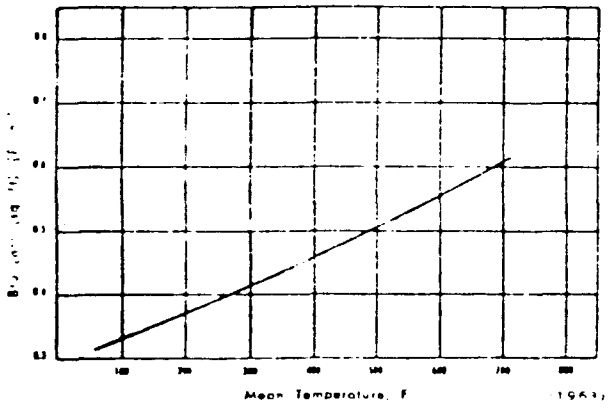
linear shrinkage after heating for 24 hours in muffle

at 750 F	0.8%
at 1000 F	0.9%
at 1200 F	1.4%

specific heat: 0.22 Btu/lb F.

thermal diffusivity 0.012 sq. ft. per hr. at 200 F. mean temperature

thermal conductivity



contains stress corrosion inhibitor

Ordinary construction grades, austenitic or stainless steel are quite vulnerable to rapid deterioration by stress corrosion cracking. This attack is caused by trace quantities of chlorides which are present in most industrial waters, industrial atmospheres and in all insulations.

Kaylo and Fiberglas have one of the lowest chloride contents of all commercially available insulations.

Now, as an added feature, Kaylo is being formulated with a stress corrosion inhibitor to protect expensive stainless steel piping and equipment from stress corrosion failure from the outside. This inhibitor has been field proven by years of experience in a variety of critical stainless steel applications. Kaylo, with the inhibitor added, has passed a very extensive series of laboratory stress corrosion tests based on the DuPont test procedure.

[illegible]

specifications

for insulation of piping with Kaylo

applicable specifications

HH-I-523a Insulation Block, Pipe Covering and Cement, Thermal, Calcium Silicate (For Temperatures up to 1200 F) class II (pipe covering).

MIL-I-2781D Insulation Pipe Covering, Thermal

1. Insulating materials

All heated pipes shall be insulated with Kaylo Pipe Insulation as manufactured by Owens-Corning Fiberglas Corporation, to the thickness noted on drawings or as shown in the table.

2. Application

All Pipe Insulation shall be applied over clean, dry surfaces, butting adjoining sections firmly together and adhered canvas, when furnished, smoothly over joints. Longitudinal and circumferential joints need not be pointed with finishing cement to conserve heat.

Insulation on pipes over 12" diameter and all outdoor piping shall be wired in place with 16 gauge soft annealed wire on no greater than 9" centers. Where double layer insulation is applied, the first layer shall be wired in place without jacket; the second layer shall be applied with all joints staggered.

All flanges, valves and fittings shall be insulated with Fiberglas molded fitting insulation or fabricated mitered segments of pipe insulation equal in thickness to the insulation on the adjoining pipe. Fittings on pipe sizes 3" and smaller may be insulated with O-C 110 Insulating Cement of equal thickness.

3. Surface finish

Indoor piping under 12" diameter not subject to abrasion or mechanical abuse requires no finish in addition to the factory-furnished canvas. Piping over 12" diameter shall be finished with 6-ounce canvas pasted in place.

Piping located outdoors shall be finished with 45-lb. roofing felt jacket with all joints lapped not less than 2". Jackets shall be wired with 16 ga. copper wire on not greater than 9" centers or banded on 12" centers with ½" galvanized bands. Other suitable weatherproof jackets such as metal, asphalt or plastic coating may be applied according to the jacket manufacturers' specifications.

Insulation on flanges, valves and fittings shall be covered with a ¼" coat of O-C 110 Insulation Cement. Insulation located indoors shall be further finished with 6 oz. canvas neatly pasted in place.

All insulation on flanges, valves and fittings located outdoors shall be covered with asphalt weatherproof mastic reinforced with an open mesh glass fabric. Mastic shall be applied in sufficient thickness to give a ⅛" dry coat and shall be troweled neatly over the fitting with the jacket on the adjacent pipe insulation lapped at least 2" over the mastic.

The foregoing is necessarily general in nature. Applicable procedure and material approval is at the [illegible] of the design engineer [illegible] requirements.

design data for Kaylo Insulations

This table [illegible] data for information on the actual thicknesses [illegible] the simplified Dimensional Standard system.

The following data are presented to aid in the design of Kaylo Pipe Insulation modified to meet specific needs. Recommendations are generalized and should be modified to meet local conditions and [illegible] requirements.

importance of calculating economic thickness

Selection of insulation thicknesses for any specific application should take into consideration at least the following criteria:

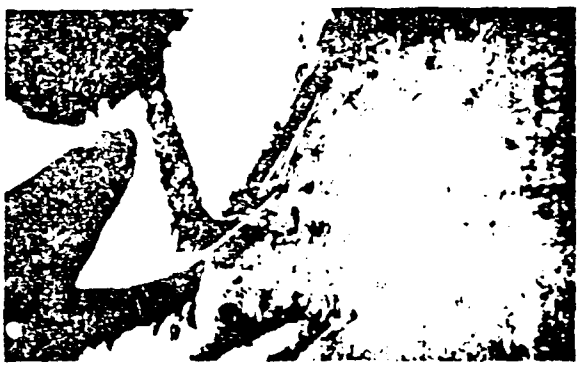
1. [illegible]
2. [illegible]
3. Cost of capital
4. Depreciation period—plant and insulation
5. Capital investment in heat production equipment
6. Temperature differential
7. Size of the pipe or surface
8. Conductivity of insulation

To assist the engineer, Owens-Corning Fiberglas has taken the figures provided by the National Insulation Manufacturers Association in their manual, "How to Determine Economic Thickness of Insulation" and, by pre-calculating many of the equations on a computer, has created a quick, simple system for resolving economic thickness. To obtain your copy of this Dividend Engineering "Economic Thickness Manual," contact your local Fiberglas branch office. Your local Fiberglas representative will be glad to explain this quick, practical method for computing economical thickness under all normal operating conditions.

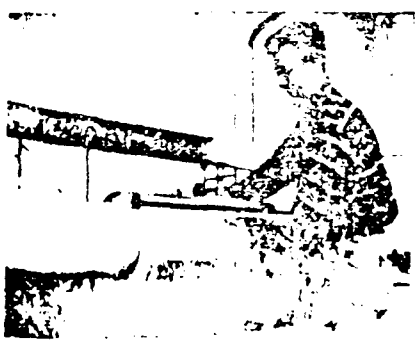
applications—Kaylo and Kaylo-Klad



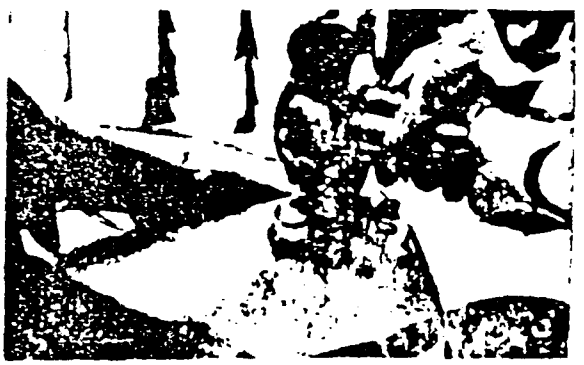
Off-site [illegible] insulated with Kaylo Pipe Insulation for efficiency and controlled temperatures at distant points







Kaylo Klad
Stainless steel and aluminum clad Kaylo Pipe Insulations apply quickly to piping. A self locking longitudinal seam and end joint strips make application of insulation and weather protection a "one-step" operation. The neat finished appearance "dresses up" the line and provides a [illegible] protection.



Kaylo-Klad aluminum jacket "locks out" the weather. The longitudinal seam joint and end joint band, with integral [illegible] provide positive weather protection.

design information

GOOD INSULATION VALUE - At low mean temperatures, Kaylo Core Material is one of the most efficient structural mineral insulations. At high mean temperatures it affords insulating values equal to those of most products which would be used for insulating purposes only.

DIMENSIONALLY STABLE - The dimensions of Kaylo Core Material changes little with variances in moisture content. Thousands of laminated structures, in use over periods ranging up to twelve years, have maintained exceptional dimensional stability and freedom from warpage.

LOW MOISTURE ABSORPTION - Kaylo Core Material is relatively porous to water vapor transmission and is slightly hygroscopic. From bone dry, it will pick up moisture in high humidity atmospheres until it reaches an equilibrium condition of 6% moisture content by weight. Both characteristics resemble those of wood, but there is no warping due to moisture content as with wood.

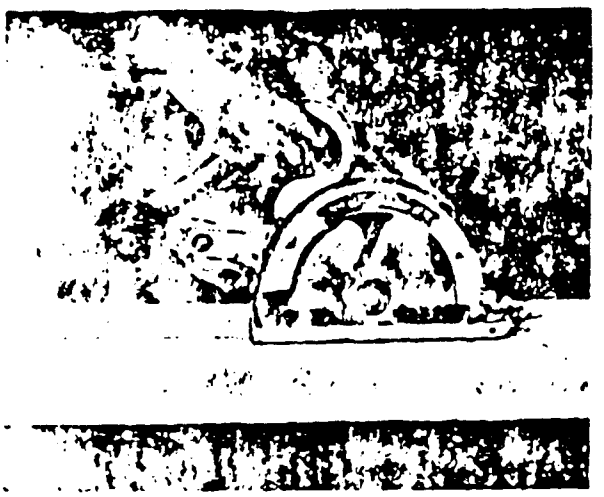
When used as a thermal insulation subject to condensation within the insulation, the warm side should be provided with an effective vapor barrier.

HIGH WET STRENGTH - Kaylo Core Material, like most other insulating materials, is not intended to serve immersed in water or exposed to extremely damp or humid conditions. Its flexural strength when wet is reduced only moderately.

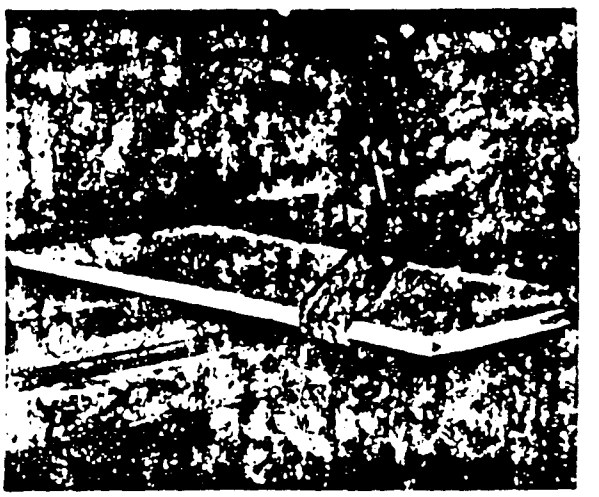
SIZES

	Kaylo-10		Kaylo-20	
	20 p.c.f.	12 p.c.f.	20 p.c.f.	13 p.c.f.
Length (in.)	36	18, 36	36	18, 36
Width (in.)	18	3, 6, 12, 18	18	3, 6, 12, 18
Thickness (in.)	1-1/2 - 3 increments of 1/16	1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4	1-1/2 - 3 increments of 1/16	1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4

GOOD WORKABILITY - Kaylo Core Material is responsive to woodworking tools. It can be sawed with a hand saw or power saw, can be routed, tongue and grooved, sanded, and in fact, run through most woodworking equipment, particularly if heavy duty cutting edges are used.



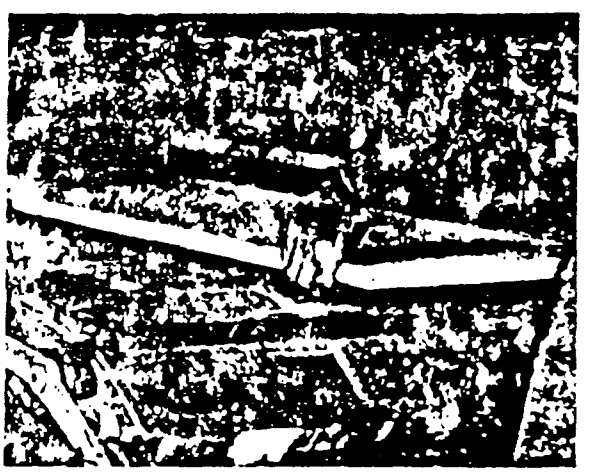
Kaylo Structual Insulating Block is readily cut with portable power saw.



Kaylo Block can be processed with woodworking equipment.



Has many cutting characteristics similar to those of wood.



Adaption of horizontal grinder doing work of both planer and sander.



Can be nailed. Cement-coated nails resist withdrawal best.



Flush veneer door with Kaylo Core installed by regular methods.

Fabrication

Lamination over a Kaylo Insulation Core - Almost any face material may be bonded to Kaylo [illegible] Insulating Block surfaces. Bonding agents can be selected to meet the requirements of the particular facing---also to satisfy the service requirements of the finished product---and still offer some choice in curing procedure.

General Requirements - Manufacturing techniques and procedures have been worked out in detail, and these along with technical advice, testing facilities, and promotional assistance are available from Owens-Corning. For general information though, the following procedures are recommended to those who are considering the use of Kaylo Core Material in a structural sandwich.

All core pieces must be brought to close tolerance in thickness. If a bonded core unit is to be produced, the entire unit may be sanded mechanically on both sides to bring all of the laminating surface to a plane. With individual pieces of core, they must be made plane to tolerances consistent with the type of face materials used and the specifications for planeness of the finished sandwich. Kaylo Core Material is manufactured to a finished tolerance of -0, +1/16 tolerance thickness.

In laminates for which requirements for fire resistance are to be met, it is generally necessary to use tongue-and-groove construction for combustible or low-melting point faces. For faces able to resist fire and its effects, tongue and grooving may not be necessary. If tongue and grooving is used, the depth need not exceed 1/8 inch, but the width of the tongue should be relatively great, on the order of 3/8 inch or more. Such construction is intended to minimize transfer of heat through joints by radiation.

The behavior of panels in fire and in the subsequent fire hose stream of water depends not only on the core but on the face and edge materials and on details of the assembly. Where warping of the panel in fire is an important factor to minimize, the tongue and groove joints mentioned above provide an articulating action between core pieces without disrupting the unity of the panel.

Treatment Prior to Lamination - Kaylo Core Material is porous and due to the finishing [illegible]ation, is slightly dusty. To obtain better adhesion, a primer is recommended. Several kinds of primer may be used, but they must be compatible with the slight alkalinity of Kaylo Core, and the molecular size of the primer must permit penetration of the solid phase into the pores of the core. Frequently, when solutions of large molecule materials are used as primers, the solvent penetrates the core, leaving the solid phase on the surface with little bond strength. One of the easiest primers to apply is a mixture of phenolic resin diluted with alcohol and water which may be sprayed or applied with a conventional glue spreader. Such a primer dries rapidly and successive units may be handled as easily as primed units.

The face materials applied to the core usually require preparation to provide good bond in the laminate. Metals must be degreased and be clean at the time of laminating; wood must be smooth and not contain excess moisture, plastic and cement products must be smooth and clean when pressed.

In any case, the face materials and the overall design must be suitable for the exposure in service anticipated. While Kaylo Core is not water-soluble and its properties are not destroyed by wetting, it has little heat insulating value when wet, and in the wet state is subject to frost action. Consequently, the design and use must be such that the core remains dry in order for the panel to function as intended. Fire hand assistance is available from Owens-Corning regarding the types and use of primers.

Adhesives - Kaylo may be bonded using most available adhesives, but like all laminates, it is advisable to choose an adhesive which will take advantage of the strengths of the components. The tensile strength of Kaylo Core Material is well in excess of 100 psi. Users of Kaylo Core Material will find it advantageous to work with their suppliers of adhesives and to specify the properties required.

recommended thicknesses—Kaylo†

(ambient still air at 80 F)

pipe temp.	280 F				480 F				680 F			
temp. diff.	200 F				400 F				600 F			
pipe size	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST
½	1	28.6	79.0	100	1½	52.5	86.7	107	2	77.0	90.6	110
¾	1	34.2	79.5	104	1½	60.0	87.6	110	2½	74.4	92.7	103
1	1	35.9	82.6	101	1½	65.3	89.0	109	2½	85.9	93.1	106
1¼	1	45.8	82.0	109	2	73.2	90.1	110	2½	98.3	93.7	109
1½	1	46.3	84.0	104	2	65.8	92.2	103	3	89.0	95.0	102
2	1	53.5	84.9	105	2	80.3	92.8	107	3	108	95.1	108
2½	1	61.5	85.5	107	2	83.7	93.5	105	3	115	96.1	107
3	1	72.7	85.7	108	2½	90.8	93.9	104	3½	124	96.1	107
4	1	85.4	86.5	105	2½	107	94.4	105	3½	146	96.4	108
5	1	105	87.5	107	2½	126	94.6	107	3½	164	96.7	110
6	1½	94.1	89.1	100	2½	143	94.8	109	4	170	97.1	107
7	1½	101	90.3	102	2½	162	94.8	109	4	193	97.2	108
8	½	4	90.4	114	2½	174	95.0	110	4	210	97.2	109
9	1½	125	90.4	104	2½	188	95.2	110	4	222	97.4	110
10	1½	133	90.8	104	3	179	95.9	106	4½	226	97.6	108
12	1½	153	91.0	104	3	210	95.9	107	4½	250	97.7	109
14	1½	178	90.4	104	3	235	95.8	108	4½	275	97.7	109
16	1½	201	90.4	107	3	255	95.9	109	5	286	97.9	108
18	1½	223	90.5	106	3	265	96.0	110	5	320	97.9	109
20	1½	246	90.5	108	3½	272	96.5	106	5	352	97.9	110
24	1½	291	90.5	108	3½	319	96.6	107	5½	364	98.2	108

†True economic thickness can now be calculated quickly and easily by following the system provided in the new Fiberglas Dividend Engineering "Economic Thickness Manual". This is available from your local Fiberglas branch office.

KEY

RT = Recommended Thickness.

HL = Heat Loss Btu/Lin. ft./hr.

E = Insulation Efficiency.

ST = Surface Temperature.*

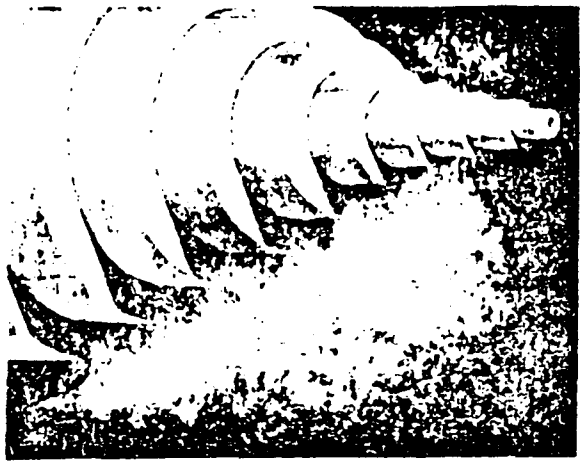
C = Commercial and Industrial

U = Power and Utility

P = Process Industries

pipe temp	280 F				480 F				680 F				880 F				1080 F				1300 F			
temp. diff.	200 F				400 F				600 F				800 F				1000 F				1120 F			
pipe size	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST
½	1	28.6	79.0	100	1	63.0	84.3	109	1½	85.0	89.5	119	2	112	92.4	124	2½	128	94.8	118	3	145	95.3	120
¾	1	34.2	79.5	104	1	71.2	84.4	108	2½	98.3	90.1	125	2	125	93.2	128	2½	144	95.3	122	3	162	95.8	122
1	1	35.9	82.6	101	1	79.2	85.7	109	2½	97	90.4	125	2	136	94.0	127	3	151	96	120	3	184	96.2	133
1¼	1	45.8	82.0	109	1	83.2	86.1	110	2½	109	90.3	127	2½	143	95	123	3	175	96.3	125	3½	200	97.1	128
1½	1	46.3	84.0	104	1	182.1	91.2	114	2	118	93.9	113	2½	146	95.5	119	3	177	96.8	122	3½	199	97.6	127
2	1	53.5	84.9	105	1	215	91.5	114	2	141	94	121	2½	170	95.8	126	3	208	96.9	130	4	215	97.5	126
2½	1	61.5	85.5	107	1	227	92.2	117	2	147	94.8	117	2½	181	96.3	124	3	206	97.5	129	4	231	97.8	125
3	1	72.7	85.7	108	1	256	92.5	118	2	164	94.9	118	3	197	96.6	124	3½	236	97.6	126	4	267	97.9	130
4	1	85.4	86.5	105	1	306	93.0	123	2½	196	95.0	128	3	242	97	124	3½	274	97.8	130	4½	286	98.2	127
5	1	105	87.5	107	1	357	93.4	123	2½	226	95.9	132	3	266	97.1	128	4	292	98.1	125	4½	326	98.1	130
6	1	97	88.1	115	1½	277	92.4	122	2½	239	96.0	135	3½	268	97.5	122	4	332	98.5	129	5	344	98.5	128
7	1½	102	90.1	112	1½	324	92.8	125	2½	270	96	127	3½	297	97.6	125	4½	333	98.5	124	5	377	98.6	129
8	½	114	90.4	103	1½	344	93.9	127	2½	287	95.2	127	3½	326	97.7	126	4½	366	98.5	125	5½	389	98.7	126
9	1½	125	90.4	104	1½	373	93.9	128	2½	303	95.3	127	3½	353	97.7	127	4½	400	98.5	128	5½	436	98.9	128
10	1½	133	90.8	133	1½	392	93.1	127	2½	318	95.3	127	3½	392	97.7	129	4½	440	98.5	130	6	452	98.9	127
12	1½	153	91.0	104	1½	436	93.7	128	2½	364	96.4	133	4	410	98	125	5	460	98.8	127	6	510	99.0	129
14	1½	178	90.4	106	2	327	96.1	123	3	385	96.8	132	4	447	98	128	5	500	98.7	129	6	556	99.0	131
16	1½	201	90.4	107	2	375	96.2	124	3	428	96.9	133	4	495	98.1	128	5	563	98.7	130	6	621	99.0	132
18	1½	223	90.5	106	2	420	96.2	125	3	466	97	134	4	540	98.1	129	5½	545	98.8	127	6	679	99.0	134
20	1½	246	90.5	108	2	474	96.5	126	3	504	97.1	135	4	594	98.1	130	5½	605	98.9	128	6	733	99.1	136
24	1½	291	90.5	108	2	565	96.6	126	3	597	97.3	136	4½	618	98.4	126	5½	685	98.9	129	6	841	99.1	137

KAYLO-20 pipe insulation *for indoor and outdoor piping up to 1800 F operating temperature*



Kaylo-20® Insulation, *colored pink for identification*, a high temperature calcium silicate heat insulation manufactured by Owens-Corning Fiberglas extends the range of Kaylo Heat Insulation to include temperatures up to 1800 F with all the properties of moisture resistance and high strength of standard Kaylo material. It also may be used with outer layers of Fiberglas Pipe Insulation to provide ultimate balance of cost and efficiency.

Kaylo-20 Insulation is highly dimensionally stable at the temperatures for which it is designed. Resistance of this insulation to high temperatures makes it extremely useful for protecting fluids in the pipe in case of fire.

sizes

thickness— Kaylo-20 Pipe Insulation is available in thicknesses from 1" to 2", according to pipe size. Kaylo-20 Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes Kaylo-20 Pipe Insulation is available to fit pipe from ½" to 20" in diameter. Kaylo-20 Tube Insulation, in copper tube size, will fit tubing from ½" to 3⅛".

forms Kaylo-20 Pipe Insulation is available in sectional or multi-segmental form depending upon pipe size. All insulation is furnished in 3' sections.

jackets

canvas— Standard canvas jackets are provided at no additional charge with Kaylo-20 Sectional Pipe and Tube Insulation of thickness [illegible] and excluding 2" [illegible] sizes. [illegible] available for use [illegible] additional charge and will be shipped only on request.

6 oz. and 8 oz. canvas jackets are available in all types, sizes and thicknesses of Kaylo-20 Pipe Insulation at additional charge. These jackets are factory applied on sectional [illegible] Tube Insulation. On multi-segmental insulation they are furnished but not adhered.

Kaylo Kloth is one [illegible] provides the insulation and protection [illegible] practical for [illegible] applications. [illegible] sets of 10 [illegible] steel bars [illegible] goods [illegible] and [illegible] which [illegible] and [illegible] application.

limitations

physical properties

density:
approximately 12 lbs. per cu. ft.

flexural strength: (ASTM C-203)
90 lbs. per sq. in.

compressive strength: (ASTM C-165)
130 lbs. per sq. in. at 5% deformation

dimensional stability:
linear shrinkage after heating for 24 hours in muffle
at 1200 F 0.7%
at 1800 F 1.6%

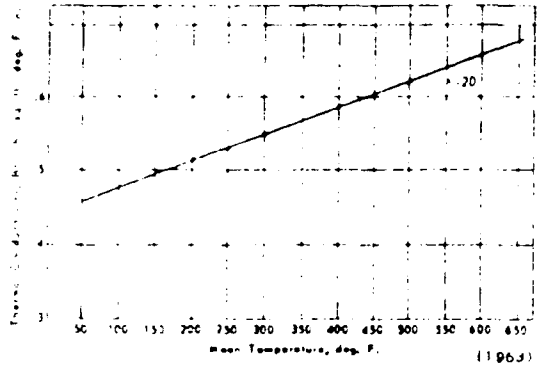
resistance to abrasion:
(conventional tumbling test—loss in weight after 10 min.)
before heating 3%
after heating for 24 hours
at 1200 F 5%
at 1800 F 20%

alkalinity: ph 10

working temperature: up to 1800 F

physical properties
specific heat: 0.22 Btu/1 lbs. F
thermal diffusivity 0.016 sq. ft. per hr. at 200 F mean temperature.

thermal conductivity



(1963)

recommended thicknesses

These are average figures and may be adjusted to meet special conditions encountered on specific jobs. Kaylo heat loss data is available for use [illegible] average economics and other considerations. Insulation thicknesses [illegible] surface temperatures are approx. 150 F.

nom. pipe size	Temperature Difference F							
	1100	1200	1300	1400	1500	1600	1700	1800
⅛	2½	2½	3	3	3½	3½	4	4
¼	2½	2½	3	3	3½	3½	4	4
½	3	3	3	3	3½	3½	4	4½
¾	3	3	3	3½	3½	4	4½	4½
1	3	3	3½	3½	3½	4	4½	5
1¼	3	3	3½	3½	4	4	4½	5
1½	3	3½	3½	4	4	4½	5	5½
2	3½	3½	3½	4	4	4½	5	5½
2½	3½	3½	4	4	4½	5	5½	6
3	3½	4	4	4	4½	5	5½	6
3½	4	4	4	4½	5	5½	6	6½
4	4	4	4½	4½	5	5½	6	6½
5	4	4½	4½	5	5½	6	6½	7
6	4½	4½	5	5	5½	6	6½	7
8	4½	5	5	5½	6	6½	7	7½
10	5	5	5½	5½	6	6½	7	8
12	5	5	5½	6	6½	7	7½	8
14	5½	5½	6	6	6½	7	7½	8
16	5½	6	6	6½	7	7½	8	8½
18	6	6	6½	6½	7	7½	8	8½
20	6	6½	6½	7	7½	8	8½	9
24 [illegible]	6½	7	7	7½	8	8½	9	9½

insulation thickness standards— Kaylo and Kaylo-20

CT

nom. tube size	O. D. of tube (nom.)	single layer nom. 1" actual	single layer nom. 1" O.D.	single layer nom. 1½" actual	single layer nom. 1½" O.D.
⅜"	½"	1.18	2.88	1.49	3.50
½"	⅝"	1.11	2.88	1.42	3.50
⅝"	¾"	1.05	2.88	1.61	4.00
¾"	⅞"	.99	2.88	1.55	4.00
1"	1⅛"	1.17	3.50	1.42	4.00
1¼"	1⅜"	1.05	3.50	1.33	4.50
1½"	1⅝"	1.17	4.00	1.42	4.50
2"	2⅛"	.81	4.00	1.61	5.00
2½"	2⅝"	.81	4.50	1.45	5.56
3"	3⅛"	.81	5.00	1.73	6.66

Federal Specification Compliance

HH-I-523a Insulation Block Pipe Covering and Cement, Thermal, Calcium Silicate (For Temperatures up to 1200 F) class 11 (pipe covering).

MIL-I-2781D Insulation Pipe Covering, Thermal, Grade I Class B, Grade II Class D, Grade III Class E.

For Applicable Specifications refer to Page 23.

note:

Insulations for tubing sizes other than standard sizes shown are available only as cut-downs from next larger size tube or pipe and will be slightly elliptical in shape

KEY

IP = Iron pipe sizes

CT = copper tubing

IL = Inner Layer

OL = Outer Layer

IP

nom. pipe size	O.D. of pipe	single layer only: nom. 1" actual	nom. 1" O.D.	nom. 1½" actual	nom. 1½" O.D.	single or double layer: nom. 2" actual	nom. 2" O.D.	nom. 2½" actual	nom. 2½" O.D.	nom. 3" actual	nom. 3" O.D.
⅛"	.84	1.00	2.38	1.96	4.00	2.06	5.00	2.89	6.66	3.39	7.66
¼"	1.05	.90	2.88	1.48	4.00	1.96	5.00	2.79	6.66	3.29	7.66
⅜"	1.32	1.08	3.50	1.58	4.50	2.11	5.56	2.68	6.66	3.18	7.66
½"	1.66	.90	3.50	1.66	5.00	1.94	5.56	2.48	6.66	2.98	7.66
¾"	1.90	1.03	4.00	1.53	5.00	2.36	6.66	2.86	7.66	3.36	8.66
1"	2.36	1.04	4.50	1.57	5.56	2.12	6.66	2.82	7.66	3.42	8.66
1¼"	2.88	1.04	5.00	1.87	6.66	2.37	7.66	2.87	8.66	3.37	9.66
1½"	3.50	1.00	5.56	1.55	6.66	2.05	7.66	2.55	8.66	3.05	9.66
2"	4.00	1.30	6.66	1.80	7.66	2.30	8.66	2.80	9.66	3.36	10.78
2½"	4.50	1.05	6.66	1.55	7.66	2.05	8.66	2.55	9.66	3.11	10.78
3"	5.00	1.30	7.66	1.80	8.66	2.30	9.66	2.86	10.78	3.36	11.78
3½"	5.56	1.02	7.66	1.52	8.66	2.02	9.66	2.58	10.78	3.08	11.78
4"	6.63	.95	8.66	1.45	9.66	2.02	10.78	2.52	11.78	3.05	12.81
5"	7.63			1.52	10.78	2.02	11.78	2.53	12.81	3.16	14.06
6"	8.63			1.52	11.78	2.03	12.81	2.06	14.06	3.16	15.06
8"	9.63			1.53	12.81	2.16	14.06	2.66	15.06	3.17	16.09
10"	10.75			1.59	14.06	2.09	15.06	2.61	16.09	3.06	17.00
12"	12.75			1.58	15.06	2.09	16.09	2.55	17.00	3.05	18.00
14"	14.00			1.59	16.09	2.05	17.00	2.55	18.00	3.05	19.00
15"	15.00			1.42	17.00	1.92	18.00	2.42	19.00	2.92	20.00
16"	16.00			1.42	18.00	1.92	19.00	2.41	20.00	2.92	21.00
17"	17.00			1.41	19.00	1.91	20.00	2.41	21.00	2.91	22.00
18"	18.00			1.41	20.00	1.91	21.00	2.41	22.00	2.91	23.00
19"	19.00			1.41	21.00	1.91	22.00	2.41	23.00	2.91	24.00
20"	20.00			1.41	22.00	1.91	23.00	2.41	24.00	2.91	25.00
21"	21.00			1.41	23.00	1.91	24.00	2.41	25.00	2.91	26.00
22"	22.00			1.41	24.00	1.91	25.00	2.41	26.00	2.91	27.00
23"	23.00			1.41	25.00	1.91	26.00	2.41	27.00	2.91	28.00
24"	24.00			1.41	26.00	1.91	27.00	2.41	28.00	2.91	29.00
25"	25.00			1.41	27.00	1.91	28.00	2.41	29.00	2.91	30.00
26"	26.00			1.46	28.00	1.98	29.00	2.50	30.00	3.02	31.00
27"	27.00			1.46	29.00	1.98	30.00	2.50	31.00	3.02	32.00
28"	28.00			1.46	30.00	1.98	31.00	2.50	32.00	3.02	33.00
29"	29.00			1.46	31.00	1.98	32.00	2.50	33.00	3.02	34.00
30"	30.00			1.46	32.00	1.98	33.00	2.50	34.00	3.02	35.00
31"	31.00			1.46	33.00	1.98	34.00	2.50	35.00	3.02	36.00
32"	32.00			1.46	34.00	1.98	35.00	2.50	36.00	3.02	37.00
33"	33.00			1.46	35.00	1.98	36.00	2.50	37.00	3.02	38.00
34"	34.00			1.46	36.00	1.98	37.00	2.50	38.00	3.02	39.00
35"	35.00			1.46	37.00	1.98	38.00	2.50	39.00	3.02	40.00
36"	36.00			1.46	38.00	1.98	39.00	2.50	40.00	3.02	41.00
37"	37.00			1.46	39.00	1.98	40.00	2.50	41.00	3.02	42.00
38											
39											

multiple layer—recommended combinations

2" IL / OL	2½" IL / OL	3" IL / OL	3½" IL / OL	4" IL / OL	4½" IL / OL	5" IL / OL	6" IL / OL
⅛x1 / 2½x1	⅛x1 / 2½x1½	⅛x1 / 3½x2	⅛x1½ / 3½x2	⅛x2 / 4½x2	⅛x2 / 4½x2½	⅛x2½ / 6x2½	⅛x3 / 7x3
¼x1 / 2½x1	¼x1 / 2½x1½	¼x1 / 3½x2	¼x1½ / 3½x2	¼x2 / 4½x2	¼x2 / 4½x2½	¼x2½ / 6x2½	¼x3 / 7x3
⅜x1 / 2½x1	⅜x1 / 2½x1½	⅜x1 / 3½x2	⅜x1½ / 3½x2	⅜x2 / 4½x2	⅜x2 / 4½x2½	⅜x2½ / 6x2½	⅜x3 / 7x3
½x1 / 2½x1	½x1 / 2½x1½	½x1 / 3½x2	½x1½ / 3½x2	½x2 / 4½x2	½x2 / 4½x2½	½x2½ / 6x2½	½x3 / 7x3
¾x1 / 3x1	¾x1 / 3x1½	¾x1½ / 4x2	¾x1½ / 4x2	¾x2 / 5x2	¾x2½ / 5x2½	¾x2½ / 6x2½	¾x3 / 7x3
1x1 / 3x1	1x1 / 3x1½	1x1½ / 4½x2	1x1½ / 4½x2	1x2 / 5x2	1x2½ / 5x2½	1x2½ / 6x2½	1x3 / 7x3
1¼x1 / 3½x1	1¼x1 / 3½x1½	1¼x1½ / 4½x2	1¼x1½ / 4½x2	1¼x2 / 5x2	1¼x2½ / 5x2½	1¼x2½ / 6x2½	1¼x3 / 7x3
1½x1 / 3½x1	1½x1 / 3½x1½	1½x1½ / 4½x2	1½x1½ / 4½x2	1½x2 / 5x2	1½x2½ / 5x2½	1½x2½ / 6x2½	1½x3 / 7x3
2x1 / 4x1	2x1 / 4x1½	2x1½ / 5x2	2x1½ / 5x2	2x2 / 6x2	2x2 / 6x2½	2x2½ / 7x2½	2x3 / 8x3
2½x1 / 4½x1	2½x1 / 4½x1½	2½x1½ / 5x2	2½x1½ / 5x2	2½x2 / 6x2	2½x2 / 6x2½	2½x2½ / 7x2½	2½x3 / 8x3
3x1 / 5x1	3x1 / 5x1½	3x1½ / 6x2	3x1½ / 6x2	3x2 / 7x2	3x2 / 7x2½	3x2½ / 8x2½	3x3 / 9x3
3½x1 / 6x1	3½x1 / 6x1½	3½x1½ / 7x2	3½x1½ / 7x2	3½x2 / 8x2	3½x2 / 8x2½	3½x2½ / 9x2½	3½x3 / 10x3
4x1 / 6x1	4x1 / 6x1½	4x1½ / 7x2	4x1½ / 7x2	4x2 / 8x2	4x2 / 8x2½	4x2½ / 9x2½	4x3 / 10x3
5x1 / 8x1	5x1 / 8x1½	5x1½ / 8x2	5x1½ / 8x2	5x2 / 9x2	5x2 / 9x2½	5x2½ / 10x2½	5x3 / 11x3
	4½x1 / 7x1½	4½x1½ / 8x2	4½x1½ / 8x2	4½x2 / 9x2	4½x2 / 9x2½	4½x2½ / 10x2½	4½x3 / 11x3
	5x1 / 8x1½	5x1½ / 8x2	5x1½ / 8x2	5x2 / 9x2	5x2 / 9x2½	5x2½ / 10x2½	5x3 / 11x3
	6x1 / 8x1½	6x1½ / 8x2	6x1½ / 8x2	6x2 / 9x2	6x2 / 9x2½	6x2½ / 10x2½	6x3 / 11x3
	8x1 / 8x1½	8x1½ / 9x2	8x1½ / 9x2	8x2 / 10x2	8x2 / 10x2½	8x2½ / 11x2½	8x3 / 12x3
		6x1½ / 9x2	6x1½ / 9x2	6x2 / 10x2	6x2 / 10x2½	6x2½ / 11x2½	6x3 / 12x3
		7x1½ / 10x2	7x1½ / 10x2	7x2 / 11x2	7x2 / 11x2½	7x2½ / 12x2½	7x3 / 13x3
		8x1½ / 10x2	8x1½ / 10x2	8x2 / 11x2	8x2 / 11x2½	8x2½ / 12x2½	8x3 / 13x3
		9x1½ / 12x2	9x1½ / 12x2	9x2 / 13x2	9x2 / 13x2½	9x2½ / 14x2½	9x3 / 15x3
		10x1½ / 12x2	10x1½ / 12x2	10x2 / 13x2	10x2 / 13x2½	10x2½ / 14x2½	10x3 / 15x3
		11x1½ / 14x2	11x1½ / 14x2	11x2 / 15x2	11x2 / 15x2½	11x2½ / 16x2½	11x3 / 17x3
		12x1½ / 15x2	12x1½ / 15x2	12x2 / 16x2	12x2 / 16x2½	12x2½ / 17x2½	12x3 / 18x3
		13x1½ / 16x2	13x1½ / 16x2	13x2 / 17x2	13x2 / 17x2½	13x2½ / 18x2½	13x3 / 19x3
		14x1½ / 17x2	14x1½ / 17x2	14x2 / 18x2	14x2 / 18x2½	14x2½ / 19x2½	14x3 / 20x3
		15x1½ / 18x2	15x1½ / 18x2	15x2 / 19x2	15x2 / 19x2½	15x2½ / 20x2½	15x3 / 21x3
		16x1½ / 19x2	16x1½ / 19x2	16x2 / 20x2	16x2 / 20x2½	16x2½ / 21x2½	16x3 / 22x3
		17x1½ / 20x2	17x1½ / 20x2	17x2 / 21x2	17x2 / 21x2½	17x2½ / 22x2½	17x3 / 23x3
		18x1½ / 21x2	18x1½ / 21x2	18x2 / 22x2	18x2 / 22x2½	18x2½ / 23x2½	18x3 / 24x3
		19x1½ / 22x2	19x1½ / 22x2	19x2 / 23x2	19x2 / 23x2½	19x2½ / 24x2½	19x3 / 25x3
		20x1½ / 23x2	20x1½ / 23x2	20x2 / 24x2	20x2 / 24x2½	20x2½ / 25x2½	20x3 / 26x3
		21x1½ / 24x2	21x1½ / 24x2	21x2 / 25x2	21x2 / 25x2½	21x2½ / 26x2½	21x3 / 27x3
		22x1½ / 25x2	22x1½ / 25x2	22x2 / 26x2	22x2 / 26x2½	22x2½ / 27x2½	22x3 / 28x3
		23x1½ / 26x2	23x1½ / 26x2	23x2 / 27x2	23x2 / 27x2½	23x2½ / 28x2½	23x3 / 29x3
		24x1½ / 27x2	24x1½ / 27x2	24x2 / 28x2	24x2 / 28x2½	24x2½ / 29x2½	24x3 / 30x3
		25x1½ / 28x2	25x1½ / 28x2	25x2 / 29x2	25x2 / 29x2½	25x2½ / 30x2½	25x3 / 31x3
		26x1½ / 29x2	26x1½ / 29x2	26x2 / 30x2	26x2 / 30x2½	26x2½ / 31x2½	26x3 / 32x3
		27x1½ / 30x2	27x1½ / 30x2	27x2 / 31x2	27x2 / 31x2½	27x2½ / 32x2½	27x3 / 33x3
		28x1½ / 31x2	28x1½ / 31x2	28x2 / 32x2	28x2 / 32x2½	28x2½ / 33x2½	28x3 / 34x3
		29x1½ / 32x2	29x1½ / 32x2	29x2 / 33x2	29x2 / 33x2½	29x2½ / 34x2½	29x3 / 35x3
		30x1½ / 33x2	30x1½ / 33x2	30x2 / 34x2	30x2 / 34x2½	30x2½ / 35x2½	30x3 / 36x3
		31x1½ / 34x2	31x1½ / 34x2	31x2 / 35x2	31x2 / 35x2½	31x2½ / 36x2½	31x3 / 37x3
		32x1½ / 35x2	32x1½ / 35x2	32x2 / 36x2	32x2 / 36x2½	32x2½ / 37x2½	32x3 / 38x3
		33x1½ / 36x2	33x1½ / 36x2	33x2 / 37x2	33x2 / 37x2½	33x2½ / 38x2½	33x3 / 39x3
		34x1½ / 37x2	34x1½ / 37x2	34x2 / 38x2	34x2 / 38x2½	34x2½ / 39x2½	34x3 / 40x3

Sectional

Tri-Segmental

K-Segmental

Over 34" Seg. 24"

K Segmental Dimensions Letter In. Dia. O Dia. Appr. Sq. Ft.

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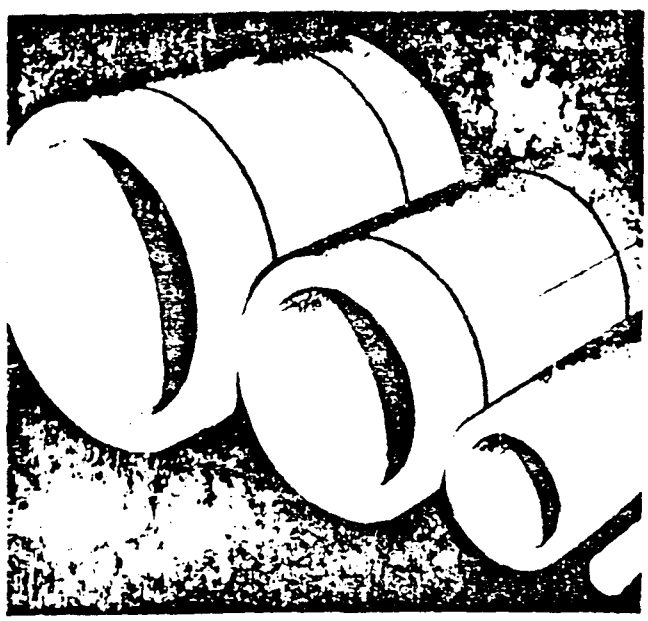
Kaylo and Kaylo-20 Pipe Insulation

KAYLO pipe insulation *for indoor or outdoor piping up to 1200 F operating temperature*



Kaylo pipe insulation applies easily and quickly with standard application methods. Ordinary tools of the trade are sufficient for all cutting, sawing or scoring. It is non-irritating to the skin and non-toxic.



Kaylo Pipe Insulation presents a superior final appearance when applied to a variety of irregularly-shaped high temperature vessels.

Kaylo* pipe insulation, a near white, rigid hydrous calcium silicate heat insulation, manufactured by Owens-Corning Fiberglas Corporation, effectively insulates indoor and outdoor piping to 1200 F. A chemically reacted material, Kaylo pipe insulation contains no added binder. For mechanical effects, a small amount of asbestos fiber is included at the time of manufacture.

This thoroughly tested and field-proven material contains the physical properties most desired for efficient, durable insulation work. It retains an appreciable percentage of its strength even after complete saturation in water, original efficiency returning after drying. The effectiveness, high strength and moisture resistance are unattained by most other insulating materials.

sizes

thickness—Kaylo Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes—Kaylo Pipe Insulation is available to fit pipe from ½" to 39" in diameter. Kaylo Tube Insulation will fit copper tubing from ½" to 3⅛" in diameter.

forms—Kaylo Pipe Insulation is available in sectional or multisegmental form depending upon pipe size. All insulation is furnished in 3 ft. sections.

jackets

canvas—Kaylo Sectional Pipe Insulation includes standard canvas jackets, at no additional charge, on thicknesses up to and including 2½". Standard canvas is available for segmental forms at a slight additional cost. Bands are available for use with this product at slight additional charge and will be furnished on request.

6 oz. and 8 oz. canvas jackets are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms, they are furnished but not adhered.

Kaylo Klad—Kaylo is also available with a soft rippled embossed aluminum jacket .016" thick or .010 stainless steel jacket. These jackets provide greater resistance to mechanical damage and present a neat finished appearance to pipe lines. The longitudinal seam has a self locking joint. Joint bands with integral mastic are furnished for sealing end joints.

limitations

Kaylo Pipe Insulation is designed for temperatures up to 1200 F and is not recommended when operating temperatures of piping exceed this limit.

*T. M. Owens-Corning Fiberglas Corp.

FIBERGLAS

Where to buy

Available from authorized distributors located in principal cities. Consult the yellow pages of your classified directory for their location or call your nearest Fiberglas Branch Office listed below

Albany, New York	438-6021
Albuquerque, New Mexico	243-4583
Anchorage, Alaska	275-8344
Atlanta, Georgia	355-6821
Baltimore, Md. (Washington)	587-0930
Billings, Montana	252-8496
Birmingham, Alabama	252-4184
Boise, Idaho	342-9311
Boston, Massachusetts	235-7540
Buffalo, New York	853-4123
Charleston, West Virginia	343-7094
Charlotte, North Carolina	334-6864
Chicago, Illinois	583-0100
Cincinnati, Ohio	281-1173
Cleveland, Ohio	621-6451
Columbia, South Carolina	252-1348
Columbus, Ohio	466-9418
Dallas, Texas	741-3982
Dayton, Ohio	293-3155
Denver, Colorado	244-2991
Des Moines, Iowa	288-4273
Detroit, Michigan	547-8000
Evansville, Indiana	425-5124
Flint, Michigan	787-2595
Fort Wayne, Indiana	743-4635
Fresno, California	233-7227
Grand Rapids, Michigan	243-3697
Greensboro, North Carolina	299-3911
Greenville, South Carolina	239-4279
Harrisburg, Pennsylvania	761-0430
Hartford, Connecticut	247-1301
Honolulu, Hawaii	58-7586
Houston, Texas	686-8426
Indianapolis, Indiana	255-4147
Jacksonville, Florida	387-2543
Kansas City, Missouri	753-7725
Los Angeles, California	723-9781
Louisville, Kentucky	634-8384
Lubbock, Texas	744-0269
Memphis, Tennessee	327-6116
Miami, Florida	696-3451
Milwaukee, Wisconsin	344-3811
Minneapolis, Minnesota	377-1730
Mobile, Alabama	471-5963
Nashville, Tennessee	254-9210
Newark, New Jersey	484-2800
New Orleans, Louisiana	486-5468
New York, New York	759-3810
Norfolk, Virginia	853-9162
Oakland, California	836-0262
Oklahoma City, Oklahoma	528-4468
Omaha, Nebraska	346-2989
Peoria, Illinois	674-3232
Philadelphia, Pennsylvania	688-8650
Phoenix, Arizona	258-4541
Pittsburgh, Pennsylvania	563-7766
Portland, Oregon	226-3505
Providence, Rhode Island	725-0100
Reno, Nevada	322-6941
Richmond, Virginia	355-5703
Rochester, New York	271-1888
Rock Island, Illinois	788-1190
Sacramento, California	927-1341
St. Louis, Missouri	725-1061
Salt Lake City, Utah	359-5247
San Antonio, Texas	824-6171
San Bernardino, California	885-3496
San Diego, California	297-3751
San Francisco, California	861-4721
San Jose, California	297-9520
Santa Ana, California	547-7781
Seattle, Washington	622-4335
Spokane, Washington	535-3575
Syracuse, New York	476-7456
Tampa, Florida	253-0183
Toledo, Ohio	248-6741
Tucson, Arizona	623-5429
Van Nuys, California	781-3145
Washington, D. C.	296-3296
Wichita, Kansas	265-2522

O-C FIBERGLAS INTERNATIONAL DIV.

GENERAL OFFICE

New York, New York 10022
717 Fifth Avenue — 759-3810

BRANCH OFFICES

Brussels 6, Belgium
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San Francisco, Calif. 94107
1200 17th Street — 863-2380

Santurce, Puerto Rico
609 First Federal Building — 723-8444

OWENS-CORNING FIBERGLAS CORPORATION

Industrial and Commercial Construction Materials Division, 717 Fifth Avenue, New York 22, N. Y.

General Offices, Toledo 1, Ohio Pacific Coast Division, Santa Clara, Calif.

physical properties

density ..... approximately 11 lb per cu ft

flexural strength ..... (ASTM C 203) over 50 lb per sq in

resistance to abrasion

(conventional tumbling test-loss in weight after 10 min.)

before heating 9%

after heating for 24 hours

at 750 F 5%
at 1000 F 4%
at 1200 F 3%

alkalinity ph 10

dimensional stability

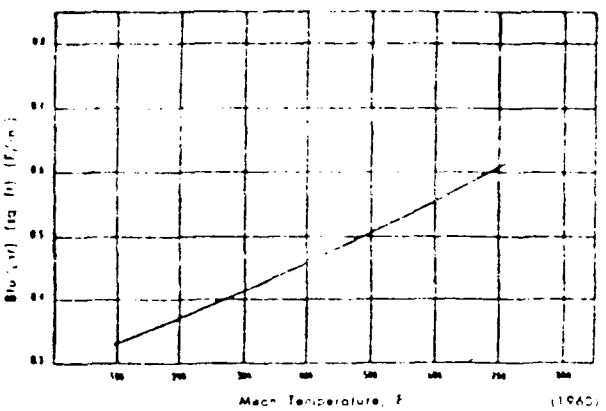
linear shrinkage after heating for 24 hours in muffle

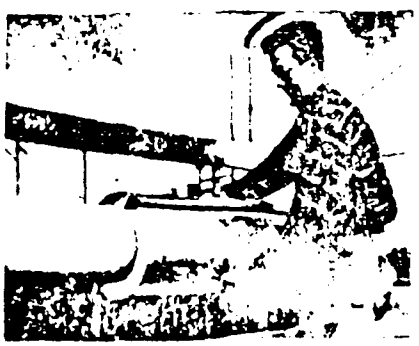
at 750 F 0.8%
at 1000 F 0.9%
at 1200 F 1.4%

specific heat 0.22 Btu/lb F

thermal diffusivity 0.012 sq ft per hr at 200 F mean temperature

thermal conductivity





Kaylo Klad

Stainless steel and aluminum clad Kaylo Pipe Insulations apply quickly to piping. A self locking longitudinal seam and end joint strips make application of insulation and weather protection a "one-step" operation. The neat finished appearance "dresses up" the line and provides a virtually maintenance free weather protection.

specifications

for insulation of piping with Kaylo

applicable specifications

HH-I-523a Insulation Block, Pipe Covering and Cement, Thermal, Calcium Silicate (For Temperatures up to 1200 F) class II (pipe covering).

MIL-I-2781C Insulation Pipe Covering, Thermal, Grade I Class B, Grade II Class D, Grade III Class E

1. Insulating materials

All heated pipes shall be insulated with Kaylo Pipe Insulation as manufactured by Owens-Corning Fiberglas Corporation, to the thickness noted on drawings or as shown in the table.

2. Application

All Pipe Insulation shall be applied over clean, dry surfaces, butting adjoining sections firmly together and adhered canvas, when furnished, smoothly over joints. Longitudinal and circumferential joints need not be painted with finishing cement to conserve heat.

Insulation on pipes over 12" diameter and all outdoor piping shall be wired in place with 16 gauge soft annealed wire on no greater than 9" centers. Where double layer insulation is applied, the first layer shall be wired in place without jacket; the second layer shall be applied with all joints staggered.

All flanges, valves and fittings shall be insulated with Fiberglas molded fitting insulation or fabricated from segments of pipe insulation equal in thickness to the insulation on the adjoining pipe. Fittings on pipe sizes 8" and smaller may be insulated with O-C 110 Insulating Cement of equal thickness.

3. Surface finish

Indoor piping under 12" diameter not subject to abrasion or mechanical abuse requires no finish in addition to the factory-furnished canvas. Piping over 12" diameter shall be finished with 6-ounce canvas pasted in place.

Piping located outdoors shall be finished with 45-lb. roofing felt jacket with all joints lapped not less than 2". Jackets shall be wired with 16 ga. copper wire on 9" centers or banded on 12" centers with ½" galvanized bands. Other suitable weatherproof jackets such as metal, asphalt or plastic coating may be applied according to the jacket manufacturers' specifications.

Insulation on flanges, valves and fittings shall be covered with a ⅛" coat of O-C 110 Insulation Cement. Insulation located indoors shall be further finished with 6 oz. canvas neatly pasted in place.

All insulation on flanges, valves and fittings located outdoors shall be covered with asphalt weatherproof mastic reinforced with an open mesh glass fabric. Mastic shall be applied in sufficient thickness to give a ⅛" dry coat and shall be troweled neatly over the fitting with the jacket on the adjacent pipe insulation lapped at least 2" over the mastic.

The foregoing is meant only as general information. Application of data and material recommendations to the specific problem is the responsibility of the designer to meet the requirements.

design data for Kaylo Insulations

This table presents reference data for information on the actual thicknesses according to the simplified Dimensional Standard system.

The following data are presented to aid in the design of Kaylo Pipe Insulation modified to meet specific needs. Recommendations are generalized and should be modified to meet local conditions and job requirements.

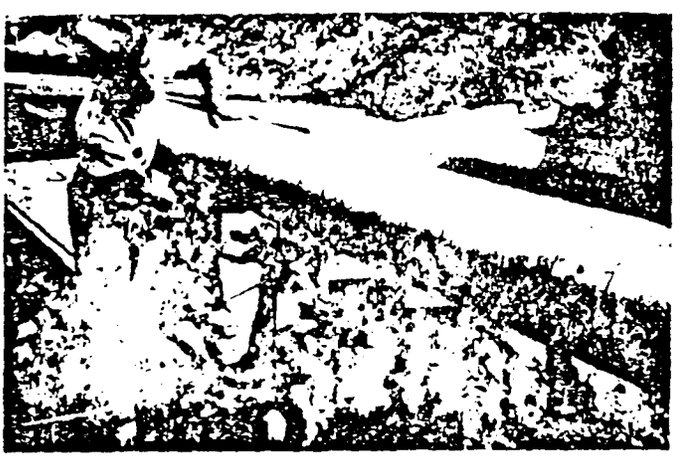
Importance of calculating economic thickness

Selection of insulation thicknesses for any specific application should take into consideration at least the following criteria.

1. Cost of insulation applied
2. Cost of heat energy
3. Cost of capital
4. Depreciation period—plant and insulation
5. Capital investment in heat production equipment
6. Temperature differential
7. Size of the pipe or surface
8. Conductivity of insulation

To assist the engineer, Owens-Corning Fiberglas has taken the figures provided by the National Insulation Manufacturers Association in their manual, "How to Determine Economic Thickness of Insulation" and, by pre-calculating many of the equations on a computer, has created a quick, simple system for resolving economic thickness. To obtain your copy of this Dividend Engineering "Economic Thickness Manual," contact your local Fiberglas branch office. Your local Fiberglas representative will be glad to explain this quick, practical method for computing economical thickness under all normal operating conditions.

applications—Kaylo and Kaylo-Klad



Off-site yard steam insulated with Kaylo Pipe Insulation for efficiency and controlled temperatures at distant points.



New Kaylo Trace Line pipe insulation and Kaylo Klad Trace Line Pipe Insulation jacketed with .016 embossed aluminum or .010 stainless steel provide great economy in the insulation of trace lines.

These pre-molded trace line insulations are designed for insulating piping 2" IPS x 1" thick up to 8" IPS x 2" thick together with a 1" trace line.

Advantages of this Kaylo molded insulation include higher strength, more rigid construction and, in the case of Kaylo Klad, single application of both insulation and weather proofing. Application and maintenance costs are both reduced. Where a trace line is greater than one inch, or extended leg insulation can be fabricated to special order contact your local OCF Branch Office.







Kaylo-Klad aluminum jacket "locks out" the weather. The longitudinal seam joint and end joint band, with integral mastic, provide positive weather protection.

recommended thicknesses—Kaylo†

(ambient still air at 80 F)

C

pipe temp.	280 F				480 F				680 F			
temp. diff.	200 F				400 F				600 F			
pipe size	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST
½	1	28.6	79.0	100	1½	52.5	86.7	107	2	77.0	90.6	110
¾	1	34.2	79.5	104	1½	60.0	87.6	110	2½	74.4	92.7	113
1	1	35.9	82.6	101	1½	65.3	89.0	109	2½	85.9	93.1	106
1¼	1	45.8	87.0	108	1½	73.2	90.1	110	2½	98.3	93.7	109
1½	1	46.3	84.0	104	2	65.8	92.2	103	3	89.0	95.0	102
2	1	53.5	84.9	105	2	80.3	91.8	107	3	108	95.1	108
2½	1	61.5	85.5	106	2	83.7	93.3	105	3	115	96.1	107
3	1	72.7	85.7	108	2½	90.8	93.9	104	3½	124	94.1	107
4	1	86.4	86.5	108	2½	107	94.4	105	3½	146	96.4	108
5	1	106	86.5	110	2½	126	94.6	107	3½	164	96.7	110
6	1½	94.2	90.0	102	2½	143	94.8	109	4	176	95.1	107
7	1½	102	90.3	103	2½	162	94.8	109	4	190	97.2	108
8	1½	114	90.4	104	2½	174	95.0	110	4	210	97.7	109
9	1½	125	90.4	104	2½	188	95.2	110	4	222	97.4	110
10	1½	133	90.8	104	3	179	95.9	106	4½	226	97.6	108
12	1½	153	91.0	104	3	210	95.9	107	4½	250	97.7	109
14	1½	178	90.4	106	3	235	95.8	108	4½	275	97.7	109
16	1½	201	90.4	107	3	255	95.9	109	5	286	97.9	109
18	1½	221	90.5	108	3	285	96.0	110	5	320	97.9	109
20	1½	246	90.5	108	3½	272	96.5	106	5	353	97.9	110
24	1½	291	90.5	108	3½	319	96.6	107	5½	364	98.2	108

†True economic thickness can now be calculated quickly and easily by following the system provided in the new Fiberglas Dividend Engineering "Economic Thickness Manual". This is available from your local Fiberglas branch office.

KEY

RT = Recommended Thickness.

HL = Heat Loss Btu/Lin. ft./hr.

E = Insulation Efficiency.

ST = Surface Temperature.*

C = Commercial and Industrial

U = Power and Utility

P = Process Industries

U

pipe temp	280 F				480 F				680 F				880 F				1080 F				1200 F			
temp. diff.	200 F				400 F				600 F				800 F				1000 F				1120 F			
pipe size	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST
½	1	28.6	79.0	100	1	63.0	84.1	100	1½	86.0	89.1	119	2	112	92.4	124	2½	128	94.8	118	3	145	95.3	120
¾	1	34.2	79.5	104	1	75.2	84.4	128	1½	98.3	90.3	126	2	125	93.2	128	2½	144	95.3	122	3	162	95.8	127
1	1	35.9	82.6	101	1	79.2	86.7	123	1½	107	91.4	125	2	136	94.0	127	3	151	96	120	3	184	96.2	133
1¼	1	45.8	87.0	108	1½	73.2	90.1	110	1½	120	92.3	127	2½	143	95	123	3	175	96.3	125	3½	200	97.1	128
1½	1	46.3	84.0	104	1½	182	90.2	114	2	108	93.9	113	2½	146	95.5	119	3	177	96.8	122	3½	199	97.6	127
2	1	53.5	84.9	105	1½	93.5	92.3	114	2	132	94	21	2½	170	95.8	126	3	208	96.9	130	4	215	97.5	126
2½	1	61.5	85.5	106	1½	95	92.3	117	2	37	94.8	117	2½	181	96.3	124	3	206	97.5	129	4	231	97.8	125
3	1	72.7	85.7	106	1½	126	93	120	2	164	94.9	128	3	197	96.6	124	3½	236	97.6	126	4	267	97.9	130
4	1	86.4	86.5	108	1½	154	93.9	123	2	202	95.0	128	3	222	97	124	3½	274	97.8	130	4½	286	98.2	127
5	1	106	86.5	110	1½	177	94.4	123	2½	206	95.9	127	3	266	97.1	128	4	292	98.1	125	4½	326	98.3	130
6	1	137	85.1	106	1½	207	92.4	126	2½	232	95.9	125	3½	268	97.5	122	4	332	98.5	129	5	344	98.5	128
7	1½	102	90.3	102	1½	224	92.8	125	2½	270	96	127	3½	297	97.6	125	4½	333	98.5	124	5	377	98.6	129
8	1½	114	90.4	103	1½	249	92.9	127	2½	287	95.4	127	3½	326	97.7	126	4½	366	98.5	125	5½	389	98.7	126
9	1½	125	90.4	108	1½	273	93.0	128	2½	313	96.3	128	3½	353	97.7	127	4½	400	98.5	128	5½	436	98.9	128
10	1½	133	90.8	103	1½	292	93.1	127	2½	348	96.3	126	3½	392	97.7	129	4½	440	98.5	130	6	452	98.9	127
12	1½	153	91.0	108	1½	338	93.7	128	2½	395	96.4	130	4	410	98	125	5	460	98.8	127	6	510	99.0	129
14	1½	178	90.4	106	2	325	94.1	123	3	385	96.8	125	4	447	96	128	5	500	98.7	129	6	556	99.0	131
16	1½	201	90.4	107	2	375	94.1	124	3	428	96.9	126	4	495	98.1	128	5	563	98.7	130	6	621	99.0	132
18	1½	223	90.5	108	2	410	94.2	125	3	480	97.2	127	4	540	98.1	129	5½	545	98.8	127	6	679	99.0	134
20	1½	246	90.5	108	2	460	98.4	127	3	535	96.9	128	4	594	98.1	130	5½	605	98.9	128	6	733	99.1	136
24	1½	291	90.5	108	2	535	94.3	128	3	610	97	128	4½	668	98.4	126	5½	685	98.9	129	6	841	99	137

P

pipe temp	280 F				480 F				680 F				880 F				1080 F				1200 F			
temp. diff.	200 F				400 F				600 F				800 F				1000 F				1120 F			
pipe size	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST	RT	HL	E	ST
½	1	28.6	79.0	100	1	63.0	84.1	100	1½	86.0	89.1	119	2	112	92.4	124	2½	128	94.8	118	3	145	95.3	120
¾	1	34.2	79.5	104	1	75.2	84.4	128	1½	98.3	90.3	126	2	125	93.2	128	2½	144	95.3	122	3	162	95.8	127
1	1	35.9	82.6	101	1	79.2	86.7	123	1½	107	91.4	125	2	136	94.0	127	3	151	96	120	3	184	96.2	133
1¼	1	45.8	87.0	108	1½	73.2	86.3	134	1½	120	92.3	127	2	160	94.4	135	2½	188	96.1	135	3	211	96.5	137
1½	1	46.3	84.0	104	1	182	87.8	144	2	108	92.4	32	2	156	95.2	126	2½	207	96.2	142	3	212	96.9	134
2	1	53.5	84.9	105	1	196	88.9	133	2	156	93.1	134	2	189	95.3	135	2½	223	96.7	138	3	250	97.1	140
2½	1	61.5	85.5	106	1	97	89.2	134	2	188	94.2	137	2	200	96.4	132	2½	237	97.1	134	3	266	97.4	139
3	1	72.7	85.7	108	1	126	89.1	137	2½	232	95.2	140	2	250	95.7	145	2½	292	97.0	147	3	316	97.5	147
4	1	86.4	86.5	108	1	154	90.2	138	2½	242	95.7	147	2	293	96	148	3	299	97.6	137	3½	335	97.9	140
5	1	106	86.5	110	1	177	90.6	144	2½	297	96.3	149	2½	294	96.8	137	3	347	97.8	140	3½	386	98.0	145
6	1	137	85.1	106	1	207	92.4	146	2½	337	96.9	139	2½	337	96.9	139	3	403	98	147	3½	430	98.2	147
7	1½	102	90.3	102	1	224	92.8	125	2	371	97.2	141	2½	371	97.2	141	3½	386	98.3	135	3½	471	98.2	148
8	1½	114	90.4	103	1	249	92.9	127	2	333	95.6	135	2½	399	97.2	140	3½	422	98.2	137	4	474	98.4	142
9	1½	125	90.4	108	1	273	93.0	128	2	367	95.9	134	2½	435	97.2	142	3½	458	98.3	138	4	513	98.5	143
10	1½	133	90.8	103	1½	292	93.1	127	2	395	95.8	137	2½	442	97.2	146	3½	504	98.3	140	4	563	98.5	146
12	1½	153	91.0	108	1½	338	93.7	128	2	459	95.9	138	2½	563	97.3	148	3½	576	98.3	143	4	647	98.5	148
14	1½	178	90.4	106	2	441	94.1	132	3	503	95.7	142	3	541	97.6	140	3½	642	98.3	147	4½	647	99.7	144
16	1½	201	90.4	107	2	494	94.1	134	3	564	96.0	144	3	602	97.6	141	4	642	98.5	140	4½	719	98.7	145
18	1½	223	90.5	108	2	544	94.2	135	3	624	96.2	147	3	657	97.7	142	4	717	98.6	142	5	798	99.1	146
20	1½	246	90.5	108	2	594	98.4	136	3	684	96.3	148	3	713	97.8	144	4	793	98.6	144	5	840	99.1	147
24	1½	291	90.5	108	2	694	94.3	137	3	847	96.4	147	3	867	97.8	147	4	873	98.6	144	5	922	99.2	148

KAYLO-20 pipe insulation *for indoor and outdoor piping up to 1800 F operating temperature*



Kaylo*-20 Insulation, colored pink for identification, a high-temperature calcium silicate heat insulation manufactured by Owens-Corning Fiberglas extends the range of Kaylo Heat Insulation to include temperatures up to 1800 F with all the properties of moisture resistance and high strength of standard Kaylo material. It also may be used with outer layers of Fiberglas Pipe Insulation to provide ultimate balance of cost and efficiency.

Kaylo-20 Insulation is highly dimensionally stable at the temperatures for which it is designed. Resistance of this insulation to high temperatures makes it extremely useful for protecting fluids in the pipe in case of fire.

sizes

thickness—Kaylo-20 Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo-20 Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes—Kaylo-20 Pipe Insulation is available to fit pipe from ½" to 39" in diameter. Kaylo-20 Tube Insulation in copper tubing sizes will fit tubing from ½" to 3⅛".

forms—Kaylo-20 Pipe Insulation is available in sectional or multi-segmental form depending upon pipe size. All insulation is furnished in 3' sections.

jackets

canvas—Standard canvas jackets are provided at no additional charge with Kaylo-20 Sectional Pipe and Tube Insulation on thicknesses up to and including 2½". [illegible] forms at a slight additional cost. Bands are available for use with this product at a small additional charge and will be shipped only on request.

6 oz. and 8 oz. canvas jackets are available on all types, sizes and thicknesses of Kaylo-20 Pipe Insulation at additional charge. These jackets are factory applied on sectional pipe and tube insulation. On multi-segmental insulation, they are furnished but not adhered.

Kaylo Klad locks out the weather, protects the insulation and provides a maintenance free line and attractive finished appearance. Factory applied jackets of .016 embossed aluminum and .010 stainless steel have longitudinal interlocking seams and joint bands with integral mastic permitting application of insulation and weather proofing at the same time and reducing application costs.

limitations

Ka[illegible]

*T[illegible] Owens-Corning Fiberglas Corp.

physical properties

density:
approximately 12 lbs. per cu. ft.

flexural strength: (ASTM C-203)
90 lbs. per sq. in.

compressive strength: (ASTM C-165)
130 lbs. per sq. in. at 5% deformation

dimensional stability:
linear shrinkage after heating for 24 hours in muffle
at 1200 F 0.7%
at 1800 F 1.6%

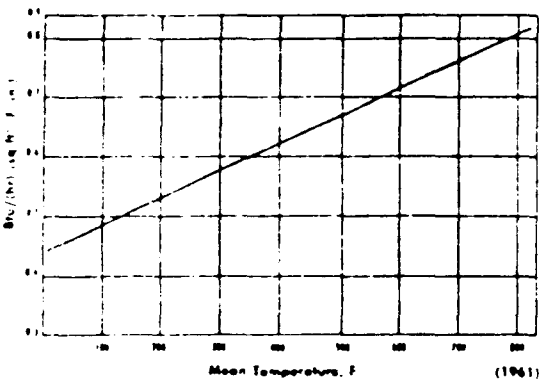
resistance to abrasion:
(conventional tumbling test—loss in weight after 10 min.)
before heating 3%
after heating for 24 hours
at 1200 F 5%
at 1800 F 20%

alkalinity: ph 10

working temperature: up to 1800 F

physical properties
specific heat: 0.22 Btu/1 lbs. F.
thermal diffusivity: 0.016 sq. ft. per hr. at 200 F mean temperature

thermal conductivity



recommended thicknesses†

These are average figures and may be adjusted to meet special conditions encountered on specific jobs. Kaylo heat loss data is available for use where plant operating economics and other conditions demand greater insulation thicknesses. Design surface temperatures are approx. 150 F.

nom. pipe size	Temperature Difference F 1100	1200	1300	1400	1500	1600	1700	1800
½	2½	2½	3	3	3½	3½	4	4
¾	2½	2½	3	3	3½	3½	4	4
1	2½	3	3	3	3½	3½	4	4½
1¼	2½	3	3	3½	3½	4	4½	4½
1½	3	3	3½	3½	3½	4	4½	5
2	3	3	3½	3½	4	4	4½	5
2½	3	3½	3½	4	4	4½	5	5½
3	3½	3½	3½	4	4	4½	5	5½
3½	3½	3½	4	4	4½	5	5½	6
4	3½	3½	4	4	4½	5	5½	6
6	4	4	4½	4½	5	5½	6	6½
8	4	4	4½	4½	5	5½	6	6½
10	4	4½	4½	5	5½	6	6½	7
12	4½	4½	5	5	5½	6	6½	7
14	4½	5	5	5½	6	6½	7	7½
16	4½	5	5½	6	6½	7	7½	8
18	5	[illegible]	[illegible]	6	6½	7	7½	8
20	5	5½	6	6½	7	7½	8	8½
24-72	5	5½	6	6½	7	7½	8	8½

† For true economic thickness request 3-C "Economic Thickness Manual"

insulation thickness standards— Kaylo and Kaylo-20

CT

nom. tube size	O. D. of tube (nom.)	single layer: nom. 1" actual	nom. 1" O.D.	nom. 1½" actual	nom. 1½" O.D.
⅜"	½"	1.18	2.88	1.49	3.50
½"	⅝"	1.11	2.88	1.42	3.50
⅝"	¾"	1.05	2.88	1.61	4.00
¾"	⅞"	.99	2.88	1.55	4.00
1"	1⅛"	1.17	3.50	1.42	4.00
1¼"	1⅜"	1.05	3.50	1.35	4.50
1½"	1⅝"	1.17	4.00	1.42	4.50
2"	2⅛"	.91	4.00	1.41	5.00
2½"	2⅝"	.91	4.50	1.45	5.56
3"	3⅛"	.91	5.00	1.73	6.66

Federal Specification Compliance

HH-I-523a Insulation Block Pipe Covering and Cement, Thermal, Calcium Silicate (For Temperatures up to 1200 F) class II (pipe covering).

MIL-I-2781C Insulation Pipe Covering, Thermal, Grade I Class B, Grade II Class D, Grade III Class E.

For Applicable Specifications refer to Page 2.

note:

Insulations for tubing sizes other than standard sizes shown are available only as cut-downs from next larger size tube or pipe and will be slightly elliptical in shape

KEY

IP = iron pipe sizes

CT = copper tubing

IL = Inner Layer

OL = Outer Layer

IP

nom. pipe size	O.D. of pipe	single layer only: nom. 1" actual	nom. 1" O.D.	nom. 1½" actual	nom. 1½" O.D.	single or double layer: nom. 2" actual	nom. 2" O.D.	nom. 2½" actual	nom. 2½" O.D.	nom. 3" actual	nom. 3" O.D.	multiple layer—recommended combinations: 2" IL / OL	2½" IL / OL	3" IL / OL	3½" IL / OL	4" IL / OL	4½" IL / OL	5" IL / OL	6" IL / OL
⅛"	.84	1.00	2.88	1.36	4.00	2.00	5.00	2.89	6.66	3.39	7.66	⅛x1	⅛x1	⅛x1 ⅛	⅛x1⅛	⅛x2	⅛x2	⅛x2½	⅛x3
¼"	1.05	.98	2.88	1.48	4.00	1.98	5.00	2.79	6.66	3.29	7.66	2½x1	¼x1	¼x1 ⅛	¼x1⅛	¼x2	¼x2	¼x2½	¼x3
⅜"	1.32	1.00	3.50	1.66	4.50	2.11	5.66	2.66	6.66	3.16	7.66	⅜x1	⅜x1	⅜x1 ⅛	⅜x1⅛	⅜x2	⅜x2	⅜x2½	⅜x3
½"	1.66	.99	3.50	1.66	5.00	1.94	5.56	2.48	6.66	2.98	7.66	½x1	½x1	½x1 ⅛	½x1⅛	½x2	½x2	½x2½	½x3
¾"	1.90	1.03	4.00	1.53	5.00	2.36	6.66	2.86	7.66	3.36	8.66	¾x1	¾x1	¾x1 ⅛	¾x1⅛	¾x2	¾x2	¾x2½	¾x3
1"	2.38	1.04	4.50	1.57	5.56	2.12	6.66	2.62	7.66	3.12	8.66	1x1	1x1	1x1⅛	1x1⅛	1x2	1x2	1x2½	1x3
1¼"	2.88	1.04	5.00	1.07	6.66	2.07	7.66	2.87	8.66	3.37	9.66	1¼x1	1¼x1	1¼x1⅛	1¼x1⅛	1¼x2	1¼x2	1¼x2½	1¼x3
1½"	3.50	1.00	5.50	1.55	6.66	2.05	7.66	2.55	8.66	3.05	9.66	1½x1	1½x1	1½x1⅛	1½x1⅛	1½x2	1½x2	1½x2½	1½x3
2"	4.00	1.30	6.66	1.80	7.66	2.30	8.66	2.80	9.66	3.36	10.78	2x1	2x1	2x1⅛	2x1⅛	2x2	2x2	2x2½	2x3
2½"	4.50	1.05	6.66	1.55	7.66	2.05	8.66	2.55	9.66	3.11	10.78	2½x1	2½x1	2½x1⅛	2½x1⅛	2½x2	2½x2	2½x2½	2½x3
3"	5.00	1.30	7.66	1.80	8.66	2.30	9.66	2.86	10.78	3.36	11.78	3x1	3x1	3x1⅛	3x1⅛	3x2	3x2	3x2½	3x3
3½"	5.56	1.32	7.66	1.82	8.66	2.32	9.66	2.58	10.78	3.08	11.78	3½x1	3½x1	3½x1⅛	3½x1⅛	3½x2	3½x2	3½x2½	3½x3
4"	6.63	.95	8.66	1.45	9.66	2.02	10.78	2.52	11.78	3.03	12.81	4x1	4x1	4x1⅛	4x1⅛	4x2	4x2	4x2½	4x3
5"	7.63			1.52	10.78	2.02	11.78	2.52	12.81	3.16	14.06	5x1	5x1	5x1⅛	5x1⅛	5x2	5x2	5x2½	5x3
6"	8.63			1.52	11.78	2.03	12.81	2.66	14.06	3.16	15.06	6x1	6x1	6x1⅛	6x1⅛	6x2	6x2	6x2½	6x3
7"	9.63			1.53	12.81	2.16	14.06	2.66	15.06	3.17	16.09	7x1	7x1	7x1⅛	7x1⅛	7x2	7x2	7x2½	7x3
8"	10.75			1.59	14.06	2.09	15.06	2.81	16.09	3.06	17.00	8x1	8x1	8x1⅛	8x1⅛	8x2	8x2	8x2½	8x3
9"	11.75			1.58	15.06	2.09	16.09	2.55	17.00	3.05	18.00	9x1	9x1	9x1⅛	9x1⅛	9x2	9x2	9x2½	9x3
10"	12.75			1.59	16.09	2.05	17.00	2.55	18.00	3.05	19.00	10x1	10x1	10x1⅛	10x1⅛	10x2	10x2	10x2½	10x3
12"	14.00			1.42	17.00	1.92	18.00	2.42	19.00	2.92	20.00	12x1	12x1	12x1⅛	12x1⅛	12x2	12x2	12x2½	12x3
14"	15.00			1.42	18.00	1.92	19.00	2.41	20.00	2.92	21.00	14x1	14x1	14x1⅛	14x1⅛	14x2	14x2	14x2½	14x3
15"	16.00			1.41	19.00	1.91	20.00	2.41	21.00	2.91	22.00	15x1	15x1	15x1⅛	15x1⅛	15x2	15x2	15x2½	15x3
16"	17.00			1.41	20.00	1.91	21.00	2.41	22.00	2.91	23.00	16x1	16x1	16x1⅛	16x1⅛	16x2	16x2	16x2½	16x3
17"	17.80			1.41	20.00	1.91	21.00	2.41	22.00	2.91	23.00	17x1	17x1	17x1⅛	17x1⅛	17x2	17x2	17x2½	17x3
18"	18.00			1.41	21.00	1.91	22.00	2.41	23.00	2.91	24.00	18x1	18x1	18x1⅛	18x1⅛	18x2	18x2	18x2½	18x3
19"	19.00			1.41	22.00	1.91	23.00	2.41	24.00	2.91	25.00	19x1	19x1	19x1⅛	19x1⅛	19x2	19x2	19x2½	19x3
20"	20.00			1.41	23.00	1.91	24.00	2.41	25.00	2.91	26.00	20x1	20x1	20x1⅛	20x1⅛	20x2	20x2	20x2½	20x3
21"	21.00			1.41	24.00	1.91	25.00	2.41	26.00	2.91	27.00	21x1	21x1	21x1⅛	21x1⅛	21x2	21x2	21x2½	21x3
22"	22.00			1.41	25.00	1.91	26.00	2.41	27.00	2.91	28.00	22x1	22x1	22x1⅛	22x1⅛	22x2	22x2	22x2½	22x3
23"	23.00			1.41	26.00	1.91	27.00	2.41	28.00	2.91	29.00	23x1	23x1	23x1⅛	23x1⅛	23x2	23x2	23x2½	23x3
24"	24.00			1.41	27.00	1.91	28.00	2.41	29.00	2.91	30.00	24x1	24x1	24x1⅛	24x1⅛	24x2	24x2	24x2½	24x3
25"	25.00			1.36	28.00	1.86	29.00	2.50	30.00	3.02	31.00	25x1	25x1	25x1⅛	25x1⅛	25x2	25x2	25x2½	25x3
26"	26.00			1.36	29.00	1.86	30.00	2.50	31.00	3.02	32.00	26x1	26x1	26x1⅛	26x1⅛	26x2	26x2	26x2½	26x3
27"	27.00			1.36	30.00	1.86	31.00	2.50	32.00	3.02	33.00	27x1	27x1	27x1⅛	27x1⅛	27x2	27x2	27x2½	27x3
28"	28.00			1.36	31.00	1.86	32.00	2.50	33.00	3.02	34.00	28x1	28x1	28x1⅛	28x1⅛	28x2	28x2	28x2½	28x3
29"	29.00			1.36	32.00	1.86	33.00	2.50	34.00	3.02	35.00	29x1	29x1	29x1⅛	29x1⅛	29x2	29x2	29x2½	29x3
30"	30.00			1.36	33.00	1.86	34.00	2.50	35.00	3.02	36.00	30x1	30x1	30x1⅛	30x1⅛	30x2	30x2	30x2½	30x3
31"	31.00			1.36	34.00	1.86	35.00	2.50	36.00	3.02	37.00	31x1	31x1	31x1⅛	31x1⅛	31x2	31x2	31x2½	31x3
32"	32.00			1.36	35.00	1.86	36.00	2.50	37.00	3.02	38.00	32x1	32x1	32x1⅛	32x1⅛	32x2	32x2	32x2½	32x3
33"	33.00			1.36	36.00	1.86	37.00	2.50	38.00	3.02	39.00	33x1	33x1	33x1⅛	33x1⅛	33x2	33x2	33x2½	33x3
34"	34.00			1.36	37.00	1.86	38.00	2.50	39.00	3.02	40.00	34x1	34x1	34x1⅛	34x1⅛	34x2	34x2	34x2½	34x3
35"	35.00			1.36	38.00	1.86	39.00	2.50	40.00	3.02	41.00	35x1	35x1	35x1⅛	35x1⅛	35x2	35x2	35x2½	35x3
36"	36.00			1.36	39.00	1.86	40.00	2.50	41.00	3.02	42.00	36x1	36x1	36x1⅛	36x1⅛	36x2	36x2	36x2½	36x3
37"	37.00			1.36	40.00	1.86	41.00	2.50	42.00	3.02	43.00	37x1	37x1	37x1⅛	37x1⅛	37x2	37x2	37x2½	37x3
38"	38.00			1.36	41.00	1.86	42.00	2.50	43.00	3.02	44.00	38x1	38x1	38x1⅛	38x1⅛	38x2	38x2	38x2½	38x3
39"	39.00			1.36	42.00	1.86	43.00	2.50	44.00	3.02	45.00	39x1	39x1	39x1⅛	39x1⅛	39x2	39x2	39x2½	39x3

Sectional

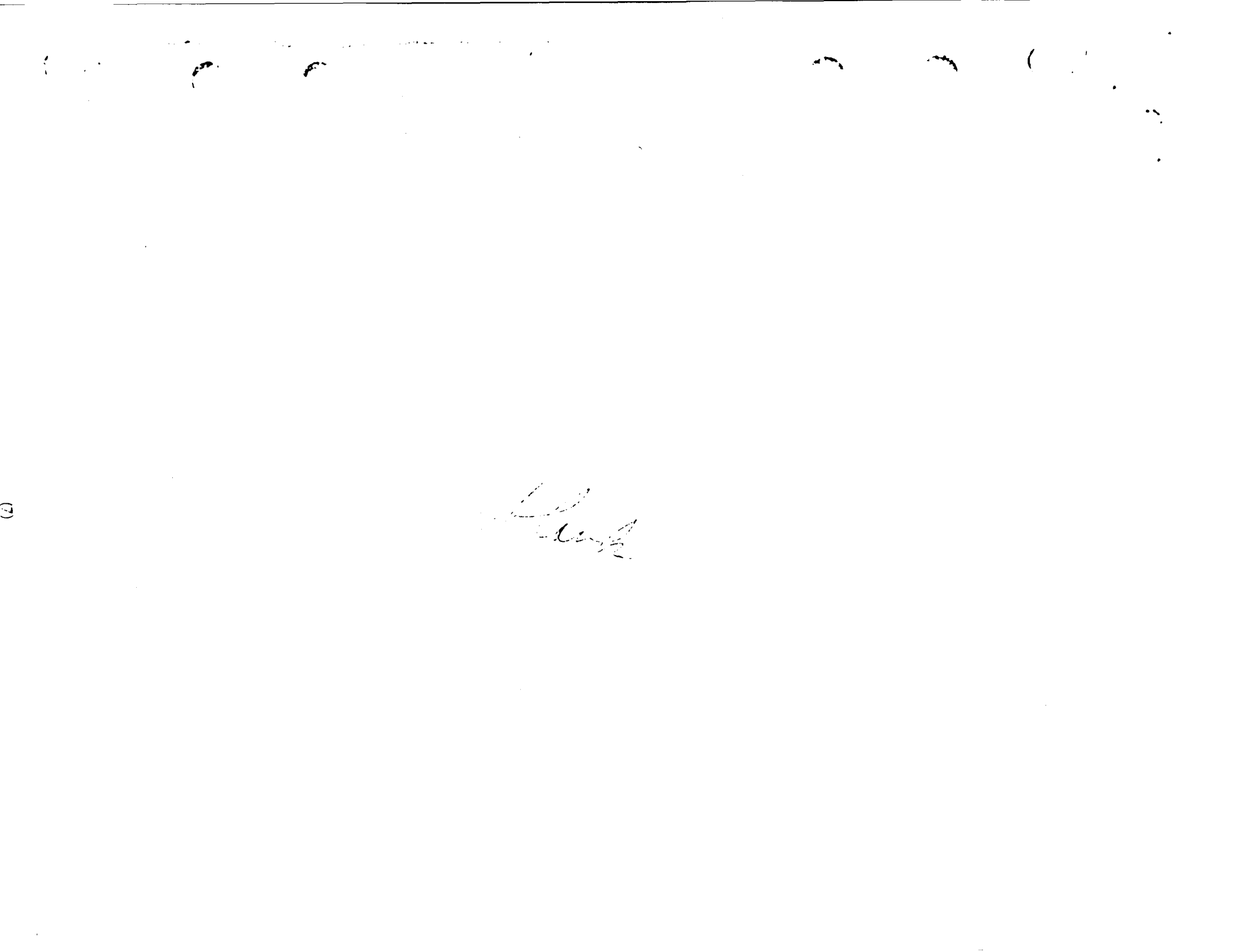
Tri-Segmental

Quad Segmental

K-Segmental

Insulation for [illegible] shall be furnished in [illegible] See K Segmental Dimensions below. [illegible] Letter designations [illegible] Segmental [illegible]

K-Segmental Dimensions: Letter	In. Dia.	O. Dia.	Approx. Outer Arc
A	[illegible]	31.00"	14"
B	[illegible]	36.00"	16"
C	[illegible]	41.00"	18"



Where to buy

Available from authorized distributors located in principal cities. Consult the yellow pages of your classified directory for their location or call your nearest Fiberglas Branch Office listed below.

Albany, New York		438-6021
Albuquerque, New Mexico		243-4583
Anchorage, Alaska	BR	5-8344
Atlanta, Georgia		799-6821
Baltimore, Maryland	SA	7-0234
Billings, Montana		252-8496
Birmingham, Alabama	TR	1-2723
Boise, Idaho		2-3102
Boston, Massachusetts	CE	5-7540
Buffalo, New York	TL	3-4123
Charleston, West Virginia	DI	3-7094
Charlotte, North Carolina	ED	4-6864
Chicago, Illinois		583-0100
Cincinnati, Ohio	AV	1-1173
Cleveland, Ohio	MA	1-6451
Columbus, Ohio	HU	6-9418
Dallas, Texas	RI	1-2992
Dayton, Ohio	AX	3-3155
Denver, Colorado	AC	2-3126
Des Moines, Iowa	AT	8-4273
Detroit, Michigan	LI	7-8000
Evansville, Indiana	HA	5-5124
Flint, Michigan	NI	9-2931
Fort Wayne, Indiana	EA	4635
Fresno, California	AD	3-7227
Grand Rapids, Michigan	CH	3-3697
Greensboro, North Carolina	CY	9-6116
Greenville, South Carolina	CE	9-4279
Hartford, Connecticut	CH	7-1301
Honolulu, Hawaii		99-5689
Houston, Texas	JA	6-1851
Indianapolis, Indiana	CL	5-4147
Jacksonville, Florida		355-0615
Kansas City, Missouri	PL	3-7725
Los Angeles, California	RA	3-9761
Louisville, Kentucky	ME	7-2588
Lubbock, Texas	SH	4-0269
Memphis, Tennessee	FA	7-6116
Miami, Florida	OX	6-3451
Milwaukee, Wisconsin	DI	4-3811
Minneapolis, Minnesota	FR	7-1730
Mobile, Alabama	HE	2-4411
Nashville, Tennessee	AL	4-9210
Newark, New Jersey		484-2800
New Orleans, Louisiana		523-2821
New York, New York	PL	9-3810
Oakland, California	TE	6-1800
Oklahoma City, Oklahoma	JA	8-4465
Omaha, Nebraska		346-2983
Peoria, Illinois		674-3232
Philadelphia, Pennsylvania	LO	4-3133
Phoenix, Arizona	AL	8-4541
Pittsburgh, Pennsylvania	AT	1-7191
Portland, Oregon	CA	6-3505
Providence, Rhode Island	PA	5-0100
Reno, Nevada		322-6941
Richmond, Virginia	EL	5-5703
Rochester, New York	BR	1-1888
Rock Island, Illinois		788-1190
Sacramento, California	WA	2-5467
St. Louis, Missouri	PA	5-1061
Salt Lake City, Utah	EL	9-5247
San Antonio, Texas	TA	4-6171
San Bernardino, California	TU	5-3496
San Diego, California	CY	7-3751
San Francisco, California	UN	1-4721
San Jose, California	CY	7-9520
Santa Ana, California	KI	7-7781
Seattle, Washington	MA	2-4335
Spokane, Washington	KE	5-3575
Stockton, California	HO	6-0137
Syracuse, New York		476-7456
Tampa, Florida		253-0183
Toledo, Ohio		248-6741
Tucson, Arizona	MA	3-5429
Van Nuys, California	ST	1-3145
Washington, D. C.	NA	8-0724

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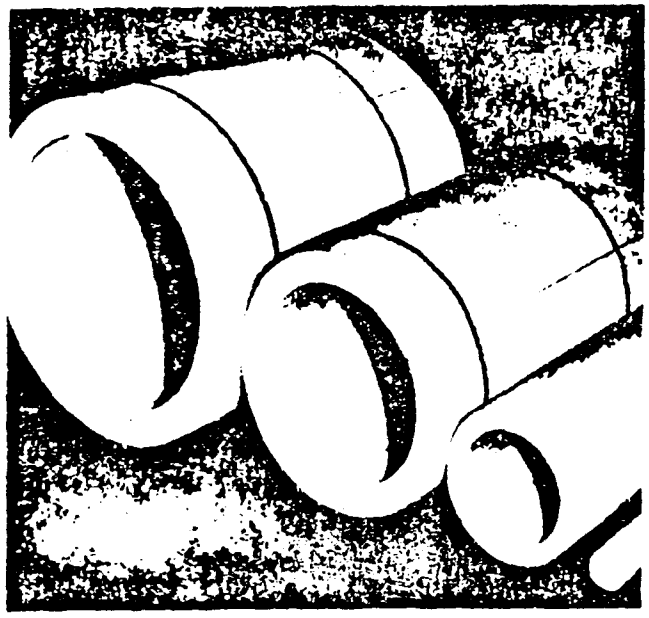
Industrial and Commercial Construction Materials Division, 717 Fifth Avenue, New York 22, N. Y.

General Offices, Toledo 1, Ohio. Pacific Coast Division, Santa Clara, Calif.

OWENS-CORNING FIBERGLAS

Kaylo and Kaylo-20 Pipe Insulation

KAYLO pipe insulation *for indoor or outdoor piping up to 1200 F operating temperature*



Kaylo pipe insulation applies easily and quickly with standard application methods. Ordinary tools of the trade are sufficient for all cutting, sawing or scoring. It is non-irritating to the skin and non-toxic.



Kaylo Pipe Insulation presents a superior final appearance when applied to a variety of irregularly-shaped high temperature vessels.

Kaylo* pipe insulation, a near white, rigid hydrous calcium silicate heat insulation, manufactured by Owens-Corning Fiberglas Corporation, effectively insulates indoor and outdoor piping to 1200 F. A chemically reacted material, Kaylo pipe insulation contains no added binder. For mechanical effects, a small amount of asbestos fiber is included at the time of manufacture.

This thoroughly tested and field-proven material contains the physical properties most desired for efficient, durable insulation work. It retains an appreciable percentage of its strength even after complete saturation in water, original efficiency returning after drying. The effectiveness, high strength and moisture resistance are unattained by most other insulating materials.

sizes

thickness—Kaylo Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes—Kaylo Pipe Insulation is available to fit pipe from ½" to 39" in diameter. Kaylo Tube Insulation will fit copper tubing from ½" to 3⅛" in diameter.

forms—Kaylo Pipe Insulation is available in sectional or multisegmental form depending upon pipe size. All insulation is furnished in 3 ft. sections.

jackets

canvas—Kaylo Sectional Pipe Insulation includes standard canvas jackets, at no additional charge, on thicknesses up to and including 2½". Standard canvas is available for segmental forms at a slight additional cost. Bands are available for use with this product at slight additional charge and will be furnished on request.

6 oz. and 8 oz. canvas jackets are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms, they are furnished but not adhered.

Kaylo Klad—Kaylo is also available with a soft rippled embossed aluminum jacket .016" thick or .010 stainless steel jacket. These jackets provide greater resistance to mechanical damage and present a neat finished appearance to pipe lines. The longitudinal seam has a self-locking joint. Joint bands with integral mastic are furnished for sealing end joints.

limitations

Kaylo Pipe Insulation is designed for temperatures up to 1200 F and is not recommended when operating temperatures of piping exceed this limit.

*T. M. Owens-Corning Fiberglas Corp.

KAYLO AND KAYLO-20 PIPE INSULATION FIBERGLAS

physical properties

density ..... approximately 11 lb. per cu. ft.

flexural strength ... (ASTM C-203) over 50 lb. per sq. in.

compressive strength (at 5% deformation)

before heating ... (ASTM C-165) 50 lb. per sq. in.

after heating for 24 hours

at 750 F	144 lb. per sq. in.
at 1000 F	123 lb. per sq. in.
at 1200 F	117 lb. per sq. in.

after boiling for 24 hours (while wet) ..... 74 lb. per sq. in.

resistance to abrasion

(conventional tumbling test loss in weight after 10 min.)

before heating 9%

after heating for 24 hours

at 750 F	5%
at 1000 F	4%
at 1200 F	3%

alkalinity: ph 10

dimensional stability

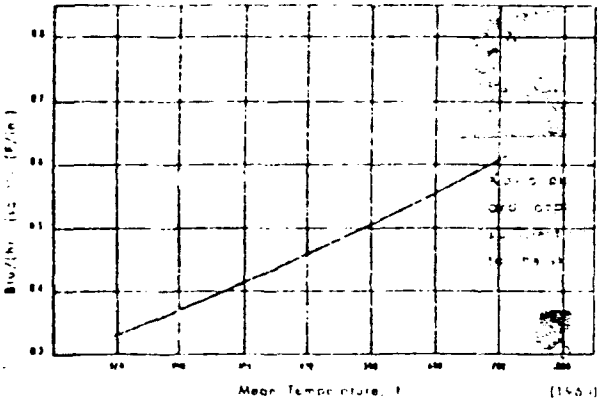
linear shrinkage after heating for 24 hours in muffin

at 750 F	0.8%
at 1000 F	0.9%
at 1200 F	1.4%

specific heat: 0.27 Btu / lb / F

thermal diffusivity 0.012 sq. ft. per hr. at 200 F mean temperature

thermal conductivity





Kaylo Klad Stainless steel and aluminum clad Kaylo Pipe Insulations apply quickly to piping. A self-locking longitudinal seam and end joint strips make application of insulation and weather protection a "one-step" operation. The neat finished appearance "dresses up" the line and provides a virtually maintenance-free weather protector.

specifications

for insulation of piping with Kaylo

applicable specifications

HH-I-523a Insulation Block, Pipe Covering and Cement, *Thermal, Calcium Silicate (For Temperatures up to 1200 F)* class II (pipe covering).

MIL-I-2781C Insulation Pipe Covering, Thermal, Grade I Class B, Grade II Class D, Grade III Class E.

1. Insulating materials

All heated pipes shall be insulated with Kaylo Pipe Insulation as manufactured by Owens-Corning Fiberglas Corporation, to the thickness noted on drawings or as shown in the table.

2. Application

All Pipe Insulation shall be applied over clean, dry surfaces, butting adjoining sections firmly together and adhered canvas, when furnished, smoothly over joints. Longitudinal and circumferential joints need not be pointed with finishing cement to conserve heat.

Insulation on pipes over 12" diameter and all outdoor piping shall be wired in place with 16 gauge soft annealed wire on no greater than 9" centers. Where double layer insulation is applied, the first layer shall be wired in place without jacket; the second layer shall be applied with all joints staggered.

All flanges, valves and fittings shall be insulated with Fiberglas molded fitting insulation or fabricated mitered segments of pipe insulation equal in thickness to the insulation on the adjoining pipe. Fittings on pipe sizes 3" and smaller may be insulated with O-C 110 Insulating Cement of equal thickness.

3. Surface finish

Indoor piping under 12" diameter not subject to abrasion or mechanical abuse requires no finish in addition to the factory-furnished canvas. Piping over 12" diameter shall be finished with 6-ounce canvas pasted in place.

Piping located outdoors shall be finished with 45-lb. roofing felt jacket with all joints lapped not less than 2". Jackets shall be wired with 16 ga. copper wire on 9" or greater than 9" centers or banded on 12" centers with ½" galvanized bands. Other suitable weatherproof jackets such as metal, asphalt or plastic coating may be applied according to the jacket manufacturers' specifications.

Insulation on flanges, valves and fittings shall be covered with a ⅛" coat of O-C 110 Insulation Cement. Insulation located indoors shall be further finished with 6 oz. canvas neatly pasted in place.

All insulation on flanges, valves and fittings located outdoors shall be covered with asphalt weatherproof mastic reinforced with an open mesh glass fabric. Mastic shall be applied in sufficient thickness to give a ⅛" dry coat and shall be troweled neatly over the fitting with the jacket on the adjacent pipe insulation lapped at least 2" over the mastic.

The foregoing is necessarily general in nature. Application procedure and material approval is at the discretion and responsibility of the design engineer for each specific requirement.

design data for Kaylo Insulations

The following table presents reference data for information on the actual thickness according to the simplified commercial Standard system.

The following data are presented to aid in the design of Kaylo Pipe Insulation modified to meet specific needs. Recommendations are generalized and should be modified to meet local conditions and job requirements.

Importance of calculating economic thickness

Selection of insulation thicknesses for any specific application should take into consideration at least the following criteria.

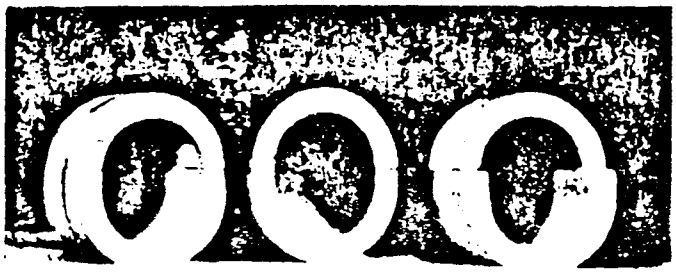
1. Cost of insulation applied
2. Cost of heat energy
3. Cost of capital
4. Depreciation period—plant and insulation
5. Capital investment in heat production equipment
6. Temperature differential
7. Size of the pipe or surface
8. Conductivity of insulation

To assist the engineer, Owens-Corning Fiberglas has taken the figures provided by the National Insulation Manufacturers Association in their manual, "How to Determine Economic Thickness of Insulation" and, by pre-calculating many of the equations on a computer, has created a quick, simple system for resolving economic thickness. To obtain your copy of this Dividend Engineering "Economic Thickness Manual," contact your local Fiberglas branch office. Your local Fiberglas representative will be glad to explain this quick, practical method for computing economical thickness under all normal operating conditions.

applications—Kaylo and Kaylo-Klad



Off-site yard steam insulated with Kaylo Pipe Insulation for efficiency and controlled temperatures at distant points.



b

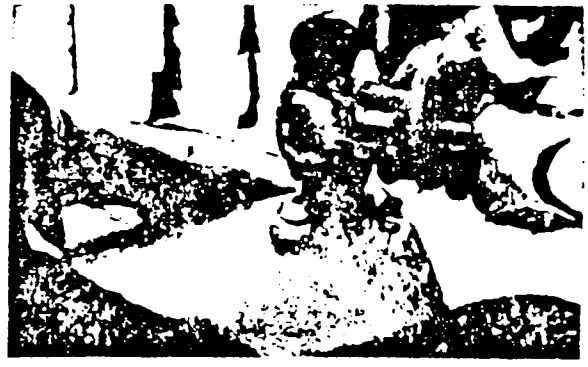
New Kaylo Trace Line pipe insulation and Kaylo Klad Trace Line Pipe Insulation (jacketed with .016 embossed aluminum or .010 stainless steel) provide great economy in the insulation of trace lines.

These pre-molded trace line insulations are designed for insulating piping 2" IPS x 1" thick up to 8" IPS x 2" thick together with a 1" trace line.

Advantages of this Kaylo molded insulation include higher strength, more rigid construction and, in the case of Kaylo Klad, single application of both insulation and weather proofing. Application and maintenance costs are both reduced. Where a trace line is greater than one inch, an extended leg insulation can be fabricated to special order, contact your local OCF Branch Office.







Kaylo-Klad aluminum jacket "locks out" the weather. The longitudinal seam joint and end joint band, with integral mastic, provide positive weather protection.

recommended thicknesses—Kaylo†

(ambient still air at 80 F)

	pipe temp.	200 F				400 F				600 F			
	temp. diff.	200 F				400 F				400 F			
	pipe size	RT	ML	E	ST	RT	ML	E	ST	RT	ML	E	ST
C	½	1	28.6	79.0	100	1½	52.5	86.7	107	2	77.0	90.5	110
	¾	1	34.2	79.5	104	1½	60.0	87.6	110	2½	74.4	92.7	103
	1	1	35.9	82.6	101	1½	65.3	89.0	109	2½	85.9	93.1	106
	1¼	1	45.8	82.0	108	1½	73.2	90.1	110	2½	98.3	93.7	109
	1½	1	46.3	84.0	104	2	65.8	92.2	103	3	80.0	95.0	102
	2	1	53.5	84.9	105	2	80.3	92.8	107	3	108	95.1	108
	2½	1	61.5	85.5	106	2	83.7	93.3	105	3	115	96.1	107
	3	1	72.7	85.7	108	2½	90.8	93.9	104	3½	124	96.1	107
	4	1	86.4	86.5	108	2½	107	94.4	105	3½	146	96.4	108
	5	1	104	86.5	110	2½	126	94.6	107	3½	164	96.7	110
	6	1½	94.2	90.0	103	2½	143	94.8	109	4	170	97.1	107
	7	1½	102	90.3	104	2½	162	94.8	109	4	190	97.2	108
	8	1½	114	90.4	104	2½	174	95.0	110	4	210	97.2	109
	9	1½	125	90.4	104	2½	188	95.2	110	4	222	97.4	110
	10	1½	133	90.8	104	3	179	95.9	106	4½	226	97.6	108
	12	1½	153	91.0	104	3	210	95.9	107	4½	250	97.7	109
	14	1½	178	90.4	106	3	235	95.8	108	4½	275	97.7	109
	16	1½	201	90.4	107	3	255	95.9	109	5	286	97.9	108
	18	1½	223	90.5	108	3	285	96.0	110	5	320	97.9	109
	20	1½	246	90.5	108	3½	272	96.5	106	5	353	97.9	110
	24	1½	291	90.5	108	3½	319	96.5	107	5½	364	98.2	108

†True economic thickness can now be calculated quickly and easily by following the system provided in the new Fiberglas Dividend Engineering "Economic Thickness Manual". This is available from your local Fiberglas branch office.

KEY

RT = Recommended Thickness.

ML = Heat Loss Btu/Lin. ft./hr.

E = Insulation Efficiency.

ST = Surface Temperature.*

C = Commercial and Industrial

U = Power and Utility

P = Process Industries

	pipe temp	200 F				400 F				600 F				800 F				1000 F				1200 F			
	temp. diff.	200 F				400 F				600 F				800 F				1000 F				1120 F			
	pipe size	RT	ML	E	ST	RT	ML	E	ST	RT	ML	E	ST	RT	ML	E	ST	RT	ML	E	ST	RT	ML	E	ST
U	½	1	28.6	79.0	100	1½	63.0	84.0	110	1½	86.0	89.5	115	2	112	92.4	124	2½	128	94.8	118	3	145	95.3	120
	¾	1	34.2	79.5	104	1	75.2	84.4	128	1½	96.3	90.3	125	2	125	93.2	128	2½	144	95.3	122	3	162	95.8	127
	1	1	35.9	82.6	101	1	79.2	85.1	123	1½	107	91.4	125	2	136	94.0	127	3	151	96	120	3	184	96.2	133
	1¼	1	45.8	82.0	108	1½	73.2	90.1	110	1½	120	91.3	127	2½	143	95	123	3	175	96.3	125	3½	200	97	128
	1½	1	46.3	84.0	104	1½	102.1	90.2	114	2	108	93.9	113	2½	146	95.5	119	3	177	96.8	122	3½	199	97.6	127
	2	1	53.5	84.9	105	1½	93.5	91.0	114	2	132	94	121	2½	170	95.8	126	3	208	96.9	130	4	215	97.5	126
	2½	1	61.5	85.5	106	1½	96.1	92.3	111	2	137	94.8	117	2½	181	96.3	124	3	206	97.5	129	4	231	97.8	125
	3	1	72.7	85.7	108	1½	126	91.5	120	2	164	94.9	128	3	197	95.6	124	3½	236	97.6	126	4	267	97.9	130
	4	1	86.4	86.5	108	1½	154	91.9	123	2	202	95.0	128	3	222	97	124	3½	274	97.8	130	4½	286	98.2	127
	5	1	104	86.5	110	1½	177	92.4	123	2½	206	95.9	122	3	266	97.1	128	4	292	98.1	125	4½	326	98.3	130
	6	1	137	85.1	116	1½	207	92.4	126	2½	239	95.9	125	3½	268	97.5	122	4	332	98.5	129	5	344	98.5	128
	7	1½	102	90.3	102	1½	224	92.8	125	2½	270	96	127	3½	297	97.6	125	4½	333	98.5	124	5	377	98.6	129
	8	1½	114	90.4	103	1½	249	92.9	127	2½	287	95.2	127	3½	326	97.7	126	4½	366	98.5	125	5½	389	98.7	126
	9	1½	125	90.4	108	1½	273	93.0	128	2½	313	95.3	128	3½	353	97.7	127	4½	400	98.5	128	5½	436	98.9	128
	10	1½	133	90.8	103	1½	292	93.2	127	2½	348	96.3	129	3½	392	97.7	129	4½	440	98.5	130	6	452	98.9	127
	12	1½	153	91.0	108	1½	338	93.7	128	2½	395	96.4	130	4	410	98	125	5	460	98.8	127	6	510	99.0	129
	14	1½	178	90.4	106	2	325	94.1	123	3	385	96.8	125	4	447	98	126	5	500	98.7	129	6	556	99.0	131
	16	1½	201	90.4	107	2	375	94.0	124	3	428	96.9	126	4	495	98.1	128	5	563	98.7	130	6	621	99.0	132
	18	1½	223	90.5	108	2	410	94.2	125	3	480	97.2	127	4	540	98.1	129	5½	545	98.8	127	6	679	99.0	134
	20	1½	246	90.5	108	2	460	98.4	126	3	535	96.9	128	4	594	98.1	130	5½	605	98.9	128	6	733	99.1	136
	24	1½	291	90.5	108	2	525	94.3	126	3	610	97	128	4½	618	98.4	126	5½	685	98.9	129	6	841	99.1	137
P	½	1	28.6	79.0	100	1	63.0	84.0	110	1	108	86.8	147	1½	124	91.6	136	2	146	94.1	134	2	179	94.2	149
	¾	1	34.2	79.5	104	1	75.2	84.4	128	1	98.3	90.3	150	1½	145	92.1	145	2	166	94.6	141	2½	175	95.5	134
	1	1	35.9	82.6	101	1	79.2	85.1	123	1½	107	91.4	125	2	136	94.0	127	2½	174	95.4	134	2½	198	95.9	141
	1¼	1	45.8	82.0	108	1	102	86.3	134	1½	120	90.3	137	2	160	94.4	135	2½	188	96.1	135	3	211	96.5	137
	1½	1	46.3	84.0	104	1	102	87.8	129	1½	135	90.4	132	2	156	95.2	126	2½	207	96.2	142	3	212	96.9	134
	2	1	53.5	84.9	105	1	118	88.7	131	1½	154	91.1	134	2	189	95.3	135	2½	223	96.7	138	3	250	97.1	140
	2½	1	61.5	85.5	106	1	135	89.1	134	1½	168	94.0	137	2	200	95.4	132	2½	237	97.1	134	3	266	97.4	139
	3	1	72.7	85.7	108	1	160	89.3	137	1½	202	93.2	141	2	250	95.7	145	2½	292	97.0	147	3	316	97.5	147
	4	1	86.4	86.5	108	1	191	89.9	138	1½	249	94.7	147	2	293	96.1	148	3	299	97.6	137	3½	335	97.9	140
	5	1	104	86.5	110	1	240	89.6	144	1½	297	94.2	149	2½	294	96.8	137	3	347	97.8	140	3½	386	98.0	145
	6	1	137	85.1	116	1½	207	92.4	126	2	225	93.4	133	2½	337	96.9	139	3	403	98	147	3½	430	98.2	147
	7	1½	102	90.3	102	1½	224	92.8	125	2	334	95.5	134	2½	375	97.0	141	3½	386	98.3	135	3½	471	98.2	148
	8	1½	114	90.4	103	1½	249	92.9	127	2	331	95.5	135	2½	399	97.2	140	3½	422	98.2	137	4	474	98.4	142
	9	1½	125	90.4	104	1½	273	93.0	128	2	349	95.9	134	2½	435	97.2	142	3½	458	98.3	138	4	513	98.5	143
	10	1½	133	90.8	103	1½	292	93.2	127	2	391	95.8	137	2½	442	97.2	146	3½	504	98.3	140	4	563	98.5	146
	12	1½	153	91.0	104	1½	338	93.7	128	2	439	95.9	138	2½	563	97.5	148	3½	576	98.3	143	4	642	98.5	148
	14	1½	178	90.4	106	1½	391	93.9	131	2	513	95.9	143	3	541	97.6	140	3½	642	98.3	147	4½	647	98.7	144
	16	1½	201	90.4	107	1½	441	94	131	2	579	95.8	144	3	606	97.6	141	4	642	98.5	149	4½	719	98.7	145
	18	1½	223	90.5	108	1½	492	94.1	134	2	654	95.9	147	3	671	97.7	142	4	707	98.6	142	5	778	98.8	140
	20	1½	246	90.5	108	1½	541	94	134	2½	718	96	135	3	735	97.7	144	4	777	98.6	142	5	840	98.9	143
	24	1½	291	90.5	108	1½	644	94	135	2½	792	97	135	3	870	97.7	47	4	903	98.6	144	5	974	98.9	143

*Surface temperature is the temperature of the outer surface of the insulation. However, the insulation efficiency of the application will be improved slightly by the [illegible]

KAYLO-20 pipe insulation *for indoor and outdoor piping up to 1800 F operating temperature*



Kaylo*-20 Insulation, colored pink for identification, a high-temperature calcium silicate heat insulation manufactured by Owens-Corning Fiberglas extends the range of Kaylo Heat Insulation to include temperatures up to 1800 F with all the properties of moisture resistance and high strength of standard Kaylo material. It also may be used with outer layers of Fiberglas Pipe Insulation to provide ultimate balance of cost and efficiency.

Kaylo-20 Insulation is highly dimensionally stable at the temperatures for which it is designed. Resistance of this insulation to high temperatures makes it extremely useful for protecting fluids in the pipe in case of fire.

sizes

thickness—Kaylo-20 Pipe Insulation is available in thicknesses from 1" to 3" depending upon pipe size. Kaylo-20 Tube Insulation is available in thicknesses of 1" and 1½".

pipe sizes—Kaylo-20 Pipe Insulation is available to fit pipe from ½" to 39" in diameter. Kaylo-20 Tube Insulation in copper tubing sizes will fit tubing from ½" to 3⅛".

forms—Kaylo-20 Pipe Insulation is available in sectional or multi-segmental form depending upon pipe size. All insulation is furnished in 3' sections.

jackets

canvas—Standard canvas jackets are provided at no additional charge with Kaylo-20 Sectional Pipe and Tube Insulation on thicknesses up to and including 2½". Standard canvas is available for segmental forms at a slight additional cost. Bands are available for use with this product at a small additional charge and will be shipped only on request.

6 oz. and 8 oz. canvas jackets are available on all types, sizes and thicknesses of Kaylo-20 Pipe Insulation at additional charge. These jackets are factory applied on sectional pipe and tube insulation. On multi-segmental insulation, they are furnished but not adhered.

Kaylo Klad locks out the weather, protects the insulation and provides a maintenance free line and attractive finished appearance. Factory applied jackets of .016 embossed aluminum and .010 stainless steel have longitudinal interlocking seams and joint bands with integral mastic permitting application of insulation and weather proofing at the same time and reducing application costs.

limitations

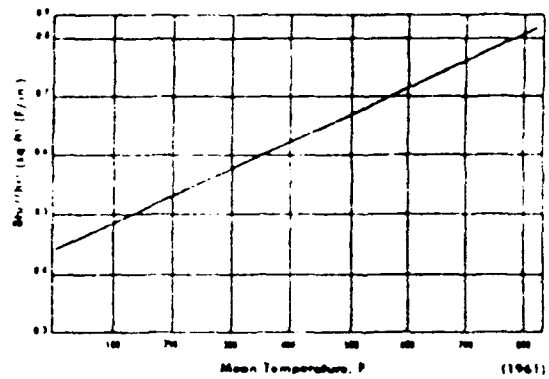
Kaylo-20 material is designed for [illegible] up to 1800 F. It should not be used where [illegible] temperature of piping exceed this limit.

*T. M. Owens-Corning Fiberglas Corp.

physical properties

density:
approximately 12 lbs. per cu. ft.
flexural strength: (ASTM C-203)
90 lbs. per sq. in.
compressive strength: (ASTM C-165)
130 lbs. per sq. in. at 5% deformation
dimensional stability:
linear shrinkage after heating for 24 hours in muffle
at 1200 F 0.7%
at 1800 F 1.6%
resistance to abrasion:
(conventional tumbling test—loss in weight after 10 min.)
before heating 3%
after heating for 24 hours
at 1200 F 5%
at 1800 F 20%
alkalinity: ph 10
working temperature: up to 1800 F
physical properties
specific heat: 0.22 Btu/1 lbs. F.
thermal diffusivity: 0.016 sq. ft. per hr. at 200 F mean temperature.

thermal conductivity



recommended thicknesses†

These are average figures and may be adjusted to meet special conditions encountered on specific jobs. Kaylo heat loss data is available for use where plant operating economics and other conditions demand greater insulation thicknesses. Design surface temperatures are approx. 150 F.

nom. pipe size	Temperature Difference F							
	1100	1200	1300	1400	1500	1600	1700	1800
½	2½	2½	3	3	3½	3½	4	4
¾	2½	2¾	3	3	3½	3½	4	4
1	2½	3	3	3	3½	3½	4	4½
1¼	2½	3	3	3½	3½	4	4½	4½
1½	3	3	3½	3½	3½	4	4½	5
2	3	3	3½	3½	4	4	4½	5
2½	3	3½	3½	4	4	4½	5	5½
3	3½	3½	3½	4	4	4½	5	5½
3½	3½	3½	4	4	4½	5	5½	6
4	3½	3½	4	4	4½	5	5½	6
6	4	4	4½	4½	5	5½	6	6½
8	4	4	4½	4½	5	5½	6	6½
10	4	4½	4½	5	5½	6	6½	7
12	4½	4½	5	5	5½	6	6½	7
14	4½	5	5	5½	6	6½	7	7½
16	4½	5	5½	6	6½	7	7½	8
18	5	5	5½	6	6½	7	7½	8
20	5	5½	6	6½	7	7½	8	8½
24-72	5	5½	6	6½	7	7½	8	8½

† for true economic thickness request O-C "Economic Thickness Manual"

insulation thickness standards— Kaylo and Kaylo-20

CT

nom. tube size	O. D. of tube (nom.)	single layer nom. 1" actual	nom. 1" O.D.	nom. 1½" actual	nom. 1½" O.D.
⅜"	⅞"	1.18	2.88	1.49	3.50
½"	1⅛"	1.11	2.88	1.42	3.50
⅝"	1⅜"	1.05	2.88	1.61	4.00
¾"	1⅝"	.99	2.88	1.55	4.00
1"	1⅞"	1.17	3.50	1.42	4.00
1¼"	2⅜"	1.05	3.50	1.35	4.50
1½"	2⅝"	1.17	4.00	1.42	4.50
2"	2⅞"	.91	4.00	1.41	5.00
2½"	3⅜"	.91	4.50	1.45	5.56
3"	3⅝"	.91	5.00	1.73	6.66

Federal Specification Compliance

HH-I-523a Insulation Block Pipe Covering and Cement, Thermal, Calcium Silicate (For Temperatures up to 1200 F) class 11 (pipe covering).

MIL-I-2781C Insulation Pipe Covering, Thermal, Grade I Class B, Grade II Class D, Grade III Class E.

For Applicable Specifications refer to Page 2.

note:

Insulations for tubing sizes other than standard sizes shown are available only as cut-downs from next larger size tube or pipe and will be slightly elliptical in shape

KEY

IP = Iron pipe sizes

CT = copper tubing

IL = Inner Layer

OL = Outer Layer

IP

nom. pipe size	O.D of pipe	single layer only nom. 1" actual	nom. 1" O.D.	nom. 1½" actual	nom. 1½" O.D.	single or double layer nom. 2" actual	nom. 2" O.D.	nom. 2½" actual	nom. 2½" O.D.	nom. 3" actual	nom. 3" O.D.	multiple layer—recommended combinations 2" IL / OL	2½" IL / OL	3" IL / OL	3½" IL / OL	4" IL / OL	4½" IL / OL	5" IL / OL	6" IL / OL
⅛"	.84	1.00	2.88	1.56	4.00	2.06	5.00	2.89	6.66	3.39	7.66	⅛x1	⅛x1	⅛x1 ⅛	⅛x1½	⅛x2	⅛x2	⅛x2½	⅛x3
¼"	1.05	.90	2.88	1.46	4.00	1.98	5.00	2.79	6.66	3.29	7.66	2½x1	2½x1	3½x1	3½x1½	4½x2	4½x2	4½x2½	6 x3
⅜"	1.32	1.08	3.50	1.58	4.50	2.11	5.56	2.86	6.66	3.16	7.66	3 x1	3 x1	4 x1	4 x1½	5 x2	5 x2	5 x2½	6 x3
½"	1.66	.90	3.50	1.66	5.00	1.94	5.56	2.48	6.66	2.98	7.66	1¼x1	1¼x1	1¼x1½	1¼x1½	1¼x2	1¼x2	1¼x2½	1¼x3
¾"	1.90	1.03	4.00	1.53	5.00	2.36	6.66	2.86	7.66	3.36	8.66	3 x1	3 x1	4½x1½	4½x1½	5 x2	5 x2	5 x2½	6 x3
1"	2.38	1.04	4.50	1.37	5.56	2.12	6.66	2.62	7.66	3.12	8.66	3½x1	3½x1	4½x1½	4½x1½	6 x2	6 x2	6 x2½	7 x3
1¼"	2.38	1.04	5.00	1.37	5.56	2.12	6.66	2.62	7.66	3.12	8.66	2 x1	2 x1	2 x1½	2 x1½	2 x2	2 x2	2 x2½	2 x3
1½"	2.88	1.04	5.00	1.87	6.66	2.37	7.66	2.87	8.66	3.37	9.66	4 x1	4 x1	5 x1½	5 x1½	6 x2	6 x2	6 x2½	7 x3
2"	3.38	1.04	5.56	1.37	5.56	2.12	6.66	2.62	7.66	3.12	8.66	2½x1	2½x1	3½x1½	3½x1½	4½x2	4½x2	4½x2½	6 x3
2½"	3.88	1.04	5.00	1.87	6.66	2.37	7.66	2.87	8.66	3.37	9.66	4½x1	4½x1	5 x1½	5 x1½	6 x2	6 x2	6 x2½	7 x3
3"	3.50	1.00	5.56	1.58	6.66	2.05	7.66	2.55	8.66	3.05	9.66	3 x1	3 x1	3 x1½	3 x1½	3 x2	3 x2	3 x2½	4 x3
3½"	4.00	1.30	6.66	1.80	7.66	2.30	8.66	2.80	9.66	3.36	10.78	5 x1	5 x1	6 x1½	6 x1½	6 x2	6 x2	6 x2½	7 x3
4"	4.50	1.05	6.66	1.55	7.66	2.05	8.66	2.55	9.66	3.11	10.78	3½x1	3½x1	4 x1½	4 x1½	4 x2	4 x2	4 x2½	5 x3
4½"	5.00	1.30	7.66	1.80	8.66	2.30	9.66	2.86	10.78	3.36	11.78	6 x1	6 x1	6 x1½	7 x1½	7 x2	8 x2	8 x2½	8 x3
5"	5.56	1.02	7.66	1.52	8.66	2.02	9.66	2.58	10.78	3.08	11.78	4½x1	4½x1	4½x1½	4½x1½	4½x2	4½x2	4½x2½	5 x3
6"	6.63	.93	8.66	1.45	9.66	2.02	10.78	2.52	11.78	3.03	12.81	7 x1	7 x1	7 x1½	7 x1½	7 x2	8 x2	8 x2½	8 x3
7"	7.63			1.52	10.78	2.02	11.78	2.53	12.81	3.46	14.06	5 x1	5 x1	5 x1½	5 x1½	5 x2	5 x2	5 x2½	6 x3
8"	8.63			1.57	11.78	2.03	12.81	2.68	14.06	3.15	15.06	8 x1	8 x1	8 x1½	8 x1½	8 x2	8 x2	8 x2½	9 x3
9"	9.63			1.53	12.81	2.16	14.06	2.66	15.06	3.17	16.09	9 x1	9 x1	9 x1½	9 x1½	9 x2	9 x2	9 x2½	9 x3
10"	10.75			1.59	14.06	2.09	15.06	2.61	16.09	3.06	17.00	12 x1	12 x1	12 x1½	12 x1½	12 x2	12 x2	12 x2½	12 x3
11"	11.75			1.58	15.06	2.09	16.09	2.55	17.00	3.05	18.00	14 x1	14 x1	14 x1½	14 x1½	14 x2	14 x2	14 x2½	14 x3
12"	12.75			1.59	16.09	2.05	17.00	2.55	18.00	3.05	19.00	15 x1	15 x1	15 x1½	15 x1½	15 x2	15 x2	15 x2½	15 x3
14"	14.00			1.42	17.00	1.92	18.00	2.42	19.00	2.92	20.00	16 x1	16 x1	16 x1½	16 x1½	16 x2	16 x2	16 x2½	16 x3
15"	15.00			1.42	18.00	1.92	19.00	2.41	20.00	2.92	21.00	17 x1	17 x1	17 x1½	17 x1½	17 x2	17 x2	17 x2½	17 x3
16"	16.00			1.41	19.00	1.91	20.00	2.41	21.00	2.91	22.00	18 x1	18 x1	18 x1½	18 x1½	18 x2	18 x2	18 x2½	18 x3
17"	17.00			1.41	20.00	1.91	21.00	2.41	22.00	2.91	23.00	19 x1	19 x1	19 x1½	19 x1½	19 x2	19 x2	19 x2½	19 x3
18"	18.00			1.41	21.00	1.91	22.00	2.41	23.00	2.91	24.00	20 x1	20 x1	20 x1½	20 x1½	20 x2	20 x2	20 x2½	20 x3
19"	19.00			1.41	22.00	1.91	23.00	2.41	24.00	2.91	25.00	21 x1	21 x1	21 x1½	21 x1½	21 x2	21 x2	21 x2½	21 x3
20"	20.00			1.41	23.00	1.91	24.00	2.41	25.00	2.91	26.00	22 x1	22 x1	22 x1½	22 x1½	22 x2	22 x2	22 x2½	22 x3
21"	21.00			1.41	24.00	1.91	25.00	2.41	26.00	2.91	27.00	23 x1	23 x1	23 x1½	23 x1½	23 x2	23 x2	23 x2½	23 x3
22"	22.00			1.41	25.00	1.91	26.00	2.41	27.00	2.91	28.00	24 x1	24 x1	24 x1½	24 x1½	24 x2	24 x2	24 x2½	24 x3
23"	23.00			1.41	26.00	1.91	27.00	2.41	28.00	2.91	29.00	25 x1	25 x1	25 x1½	25 x1½	25 x2	25 x2	25 x2½	25 x3
Oval Seg 24"	24.00			1.41	27.00	1.91	28.00	2.41	29.00	2.91	30.00	26 x1	26 x1	26 x1½	26 x1½	26 x2	26 x2	26 x2½	26 x3
25"	25.00			1.46	28.00	1.98	29.00	2.50	30.00	3.02	31.00	27 x1	27 x1	27 x1½	27 x1½	27 x2	27 x2	27 x2½	27 x3
26"	26.00			1.46	29.00	1.98	30.00	2.50	31.00	3.02	32.00	28 x1	28 x1	28 x1½	28 x1½	28 x2	28 x2	28 x2½	28 x3
27"	27.00			1.46	30.00	1.98	31.00	2.50	32.00	3.02	33.00	29 x1	29 x1	29 x1½	29 x1½	29 x2	29 x2	29 x2½	29 x3
28"	28.00			1.46	31.00	1.98	32.00	2.50	33.00	3.02	34.00	30 x1	30 x1	30 x1½	30 x1½	30 x2	30 x2	30 x2½	30 x3
29"	29.00			1.46	32.00	1.98	33.00	2.50	34.00	3.02	35.00	31 x1	31 x1	31 x1½	31 x1½	31 x2	31 x2	31 x2½	31 x3
30"	30.00			1.46	33.00	1.98	34.00	2.50	35.00	3.02	36.00	32 x1	32 x1	32 x1½	32 x1½	32 x2	32 x2	32 x2½	32 x3
31"	31.00			1.46	34.00	1.98	35.00	2.50	36.00	3.02	37.00	33 x1	33 x1	33 x1½	33 x1½	33 x2	33 x2	33 x2½	33 x3
32"	32.00			1.46	35.00	1.98	36.00	2.50	37.00	3.02	38.00	34 x1	34 x1	34 x1½	34 x1½	34 x2	34 x2	34 x2½	34 x3
33"	33.00			1.46	36.00	1.98	37.00	2.50	38.00	3.02	39.00	35 x1	35 x1	35 x1½	35 x1½	35 x2	35 x2	35 x2½	35 x3
34"	34.00			1.46	37.00	1.98	38.00	2.50	39.00	3.02	40.00	36 x1	36 x1	36 x1½	36 x1½	36 x2	36 x2	36 x2½	36 x3
35"	35.00			1.46	38.00	1.98	39.00	2.50	40.00	3.02	41.00	37 x1	37 x1	37 x1½	37 x1½	37 x2	37 x2	37 x2½	37 x3
36"	36.00			1.46	39.00	1.98	40.00	2.50	41.00	3.02	42.00								
37"	37.00			1.46	40.00	1.98	41.00	2.50	42.00	3.02	43.00								
38"	38.00			1.46	41.00	1.98	42.00	2.50	43.00	3.02	44.00								
39"	39.00			1.46	42.00	1.98	43.00	2.50	44.00	3.02	45.00								

Tri-Segmental

K-Segmental

Segmental Dimensions: Letter — I.D. — O.D. — Approx. Outer Arc

Where to buy

Available from authorized distributors located in principal cities. Consult the yellow pages of your classified directory for their location or call your nearest Fiberglas Branch Office listed below.

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Boise, Idaho		2-3102
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Portland, Oregon	CA	6-3505
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Rochester, New York	BR	1-1888
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Salt Lake City, Utah	EL	9-5247
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PL 9-3810

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OWENS-CORNING FIBERGLAS CORPORATION

Industrial and Commercial Construction Materials Division, 717 Fifth Avenue, New York 22, N. Y.

General Offices, Toledo 1, Ohio. Pacific Coast Division, Santa Clara, Calif.

OWENS-CORNING
FIBERGLAS

Customer Service Technical Report

KAYLO PIPE INSULATION

Sizes, Forms and Thicknesses
(Supplement to IN1.C5)

No. 2-IN-267
Date May 1, 1957
Customer
Requested by Houston Branch
Prepared by Industrial Insulation Division

The table below indicates the range of sizes and forms in which Kaylo Pipe Insulation is available.

nom. pipe dia	O.D. of pipe	single layer only				single or double layer						multiple layer only							
		nom. 1"		nom. 1½"		nom. 2"		nom. 2½"		nom. 3"		nom. 3½"		nom. 4"		nom. 4½"		nom. 5"	
		actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.	actual	O.D.
⅛"	.84	1.00	2.88	1.56	4.00	2.06	5.00	2.89	6.66	3.39	7.66								
¼"	1.05	.90	2.88	1.46	4.00	1.96	5.00	2.79	6.66	3.29	7.66								
1"	1.32	1.08	3.50	1.58	4.50	2.11	5.56	2.66	6.66	3.16	7.66								
1¼"	1.66	.90	3.50	1.66	5.00	1.94	5.56	2.48	6.66	2.98	7.66								
1½"	1.90	1.03	4.00	1.53	5.00	2.36	6.66	2.86	7.66	3.36	8.66								
2"	2.38	1.04	4.50	1.57	5.56	2.12	6.66	2.62	7.66	3.12	8.66	3.62	9.66	4.18	10.78	4.68	11.78	5.30	12.81
2½"	2.88	1.04	5.00	1.87	6.66	2.37	7.66	2.87	8.66	3.37	9.66	3.93	10.78	4.43	11.78	4.95	12.81	5.57	14.06
3"	3.50	1.00	5.56	1.53	6.66	2.05	7.66	2.55	8.66	3.05	9.66	3.61	10.78	4.11	11.78	4.63	12.81	5.25	14.06
3½"	4.00	1.30	6.66	1.80	7.66	2.30	8.66	2.80	9.66	3.36	10.78	3.86	11.78	4.38	12.81	5.00	14.06	5.80	15.06
4"	4.50	1.05	6.66	1.55	7.66	2.05	8.66	2.55	9.66	3.11	10.78	3.61	11.78	4.13	12.81	4.75	14.06	5.25	15.06
4½"	5.00	1.30	7.66	1.80	8.66	2.30	9.66	2.86	10.78	3.36	11.78	3.88	12.81	4.50	14.06	5.00	15.06	5.51	16.09
5"	5.56	1.02	7.66	1.52	8.66	2.02	9.66	2.58	10.78	3.08	11.78	3.59	12.81	4.22	14.06	4.72	15.06	5.23	16.09
6"	6.62	.95	8.66	1.48	9.66	2.02	10.78	2.52	11.78	3.03	12.81	3.66	14.06	4.16	15.06	4.68	16.09	5.13	17.00
7"	7.63			1.52	10.78	2.02	11.78	2.53	12.81	3.16	14.06	3.66	15.06	4.17	16.09	4.63	17.00	5.13	18.00
8"	8.63			1.52	11.78	2.03	12.81	2.66	14.06	3.16	15.06	3.67	16.09	4.13	17.00	4.63	18.00	5.13	19.00
9"	9.63			1.53	12.81	2.16	14.06	2.66	15.06	3.17	16.09	3.63	17.00	4.13	18.00	4.63	19.00	5.13	20.00
10"	10.75			1.59	14.06	2.09	15.06	2.61	16.09	3.06	17.00	3.56	18.00	4.06	19.00	4.56	20.00	5.06	21.00
11"	11.75			1.58	15.06	2.09	16.09	2.55	17.00	3.05	18.00	3.55	19.00	4.05	20.00	4.54	21.00	4.55	22.00
12"	12.75			1.59	16.09	2.05	17.00	2.55	18.00	3.05	19.00	3.55	20.00	4.05	21.00	4.54	22.00	4.55	23.00
14"	14.00			1.42	17.00	1.92	18.00	2.42	19.00	2.92	20.00	3.42	21.00	3.92	22.00	4.42	23.00	4.92	24.00
15"	15.00			1.42	18.00	1.92	19.00	2.41	20.00	2.92	21.00	3.42	22.00	3.92	23.00	4.41	24.00	4.92	25.00
16"	16.00			1.41	19.00	1.91	20.00	2.41	21.00	2.91	22.00	3.41	23.00	3.91	24.00	4.41	25.00	4.91	26.00
17"	17.00			1.41	20.00	1.91	21.00	2.41	22.00	2.91	23.00	3.41	24.00	3.91	25.00	4.41	26.00	4.91	27.00
18"	18.00			1.41	21.00	1.91	22.00	2.41	23.00	2.91	24.00	3.41	25.00	3.91	26.00	4.41	27.00	4.91	28.00
19"	19.00			1.41	22.00	1.91	23.00	2.41	24.00	2.91	25.00	3.41	26.00	3.91	27.00	4.41	28.00	4.91	29.00
20"	20.00			1.41	23.00	1.91	24.00	2.41	25.00	2.91	26.00	3.41	27.00	3.91	28.00	4.41	29.00	4.91	30.00
21"	21.00			1.41	24.00	1.91	25.00	2.41		2.91	27.00	3.41	28.00	3.89	29.00	4.41	30.00	4.91	31.00
22"	22.00			1.41	25.00	1.91	26.00	2.41	27.00	2.91	28.00	3.39	29.00	3.89	30.00	4.41	31.00	4.91	32.00
23"	23.00			1.41	26.00	1.91	27.00	2.41	28.00	2.91	29.00	3.39	30.00	3.89	31.00	4.41	32.00	4.91	33.00
24"	24.00			1.41	27.00	1.91	28.00	2.41	29.00	2.91	30.00	3.39	31.00	3.89	32.00	4.41	33.00	5.00	34.00
25"	25.00			1.46	28.00	1.98	29.00	2.50	30.00	3.02	31.00	3.44	32.00	3.96	33.00	4.48	34.00	5.00	35.00
26"	26.00			1.46	29.00	1.98	30.00	2.50	31.00	3.02	32.00	3.44	33.00	3.96	34.00	4.48	35.00	5.00	36.00
27"	27.00			1.46	30.00	1.98	31.00	2.50	32.00	3.02	33.00	3.44	34.00	3.96	35.00	4.48	36.00	5.00	37.00
28"	28.00			1.46	31.00	1.98	32.00	2.50	33.00	3.02	34.00	3.44	35.00	3.96	36.00	4.48	37.00	5.00	38.00
29"	29.00			1.46	32.00	1.98	33.00	2.50	34.00	3.02	35.00	3.44	36.00	3.96	37.00	4.48	38.00	5.00	39.00
30"	30.00			1.46	33.00	1.98	34.00	2.50	35.00	3.02	36.00	3.44	37.00	3.96	38.00	4.48	39.00	5.00	40.00
31"	31.00			1.46	34.00	1.98	35.00	2.50	36.00	3.02	37.00	3.44	38.00	3.96	39.00	4.48	40.00	5.00	41.00
32"	32.00			1.46	35.00	1.98	36.00	2.50	37.00	3.02	38.00	3.44	39.00	3.98	40.00	4.48	41.00	5.00	42.00
33"	33.00			1.46	36.00	1.98	37.00	2.50	38.00	3.02	39.00	3.48	40.00	3.98	41.00	4.48	42.00	5.00	43.00
34"	34.00			1.46	37.00	1.98	38.00	2.50	39.00	3.02	40.00	3.48	41.00	3.98	42.00	4.48	43.00	5.00	44.00
35"	35.00			1.46	38.00	1.98	39.00	2.50	40.00	3.02	41.00	3.48	42.00	3.98	43.00	4.48	44.00	5.00	45.00
36"	36.00			1.46	39.00	1.98	40.00	2.50	41.00	3.02	42.00	3.48	43.00	3.98	44.00	4.48	45.00	5.00	46.00
37"	37.00			1.46	40.00	1.98	41.00	2.50	42.00	3.02	43.00	3.48	44.00	3.98	45.00	4.48	46.00	5.00	47.00
38"	38.00			1.46	41.00	1.98	42.00	2.50	43.00	3.02	44.00	3.48	45.00	3.98	46.00	4.48	47.00	5.00	48.00
39"	39.00			1.46	42.00	1.98	43.00	2.50	44.00	3.02	45.00	3.48	46.00	3.98	47.00	4.48	48.00	5.00	49.00

Sectional

Tri-segmental

Quad-segmental

Bi-segmental

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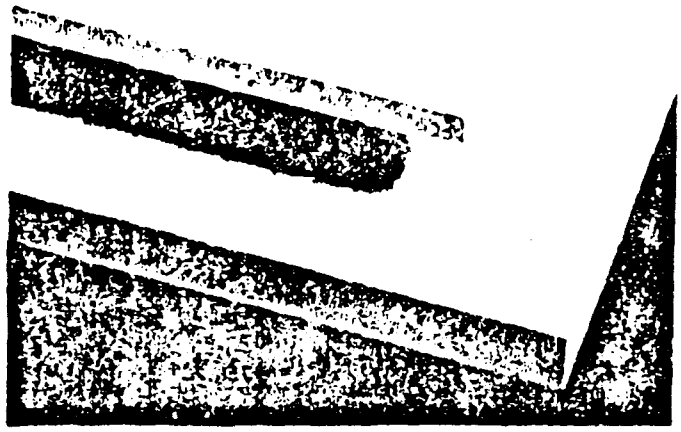
OWENS/CORNING FIBERGLAS

Owens-Corning Fyrcor

a noncombustible, calcium silicate, structural and insulating panel for temperatures up to 1200°F.



uses

The combination of structural strength, thermal insulation, and noncombustibility make Fyrcor usable as a core material in bulkheads, doors, partitions, and fire resistive walls. The light weight structural properties of the product allows it to be readily fabricated, shaped, and drilled for use as a housing or enclosure for ovens, dryers, heat screens, and other heat containment. Wood, metal, and plastic surfacing materials can be laminated to the product.

description

Fyrcor is a homogeneous insulating material formed into structural panels. Suitable over a wide range of temperatures, Fyrcor is a noncombustible panel, having a mineral composition. It combines good thermal insulation properties with dimensional stability and offers light weight and excellent strength characteristics for ease in erection. Fyrcor can be machined to close tolerances and may be sawed, planed, sanded, screwed, nailed, and painted, similar to wood. In addition, Fyrcor is vermin and rot-proof, and resistant to most chemicals and their fumes.

Product designations: Fyrcor 23 Fyrcor 36

benefits

noncombustible — Fyrcor panels have ratings of "0" Flame Spread, "0" Fuel Contributed, and "0" Smoke Developed.

thermal efficiency — Low heat flow through the panel makes it a good product for heat containment. It can be used as an insulating and structural panel at the same time.

dimensional stability — Fyrcor retains its dimensions through a wide range of temperatures and moisture conditions. Moisture or high humidity does not affect the physical properties.

versatile — As a panel or core, Fyrcor is easily fabricated, shaped, or drilled.

wide range temperature use — Because of their dimensional stability, Fyrcor 23 and 36 can be used up to 1200°F.

facings — Various types of facing, wood, metal, or plastic can be applied to properly prepared Fyrcor.

FIBERGLAS

OC-110 mineral wool all-purpose cement

for temperatures up to 1000°F



Applied in only one coat to any desired thickness, this high-quality, non-cracking insulating cement is clean and easy to handle—saves time and cuts installation costs. Quick-setting, it forms an excellent bond with insulating blocks and other types of industrial insulations, and dries to a light color with a smooth, crack-free finish. Indoor installations provide additional economy by requiring no further finishing under normal usage. The "k" factor is exceptionally favorable. Available in 50 lb. bags.

Performance characteristics

property	units	test method	Fyrcor 23	Fyrcor 36
density (dry)	lbs./ft.³	ASTM C303-56	23	36
flexural strength	psi	ASTM C203 (OCF SO5Ca)	550	1000
impact, charpy	ft. lbs./in of width	ASTM D256-52 Method B (5"x½"x½") Unnotched Spec	.32	36
screw holding	lbs./screw	MAR AD SPEC 32-MA-5A	150	225
moisture absorption	% by wt	MAR AD SPEC 32-MA-5A	5%	5%
dimensional stability Linear Shrinkage at 1200°F @ 24 hrs	% (Ave.)	ASTM C356-60 (OCF D-06 Aa)		
Length			1.0%	1.0%
Width			1.0%	1.0%
Thickness			2.0%	2.0%
fire hazard classification (Listed under Underwriters Laboratories Inc. Guide No. 40 U8.13)		ASTM E84 UL 723	Flame Spread "0" Smoke Developed "0" Fuel Contributed "0"	
thermal conductivity @ 75°F Mean	Btu in./hr. ft.² F	ASTM C-177-63 (OCF H-05A)	.55	.71

standard sizes

Fyrcor 23 and 36

3' x 8'
4' x 8'
5' x 8'

standard thickness

¾" to 2" in ⅛" increments
¾" to 2" in ¼" increments
¾" to 1¼" in ⅛" increments

3' x 8' and 4' x 8' panels available in ½" thickness.

tolerances

Width and Length: ± 1/16"
Thickness (½" through 2"): ± 1/32"
Squareness: Max. 1/16" on width dimension

fabrication techniques

Metal working tools should be used to drill, cut, or machine Fyrcor. Fabricate only when the board is dry. During all fabrication, adequate dust collection or acceptable air respirators are strongly recommended. Drill all holes oversize when using bolt mountings. Do not apply pressure to nuts. If sheet metal screws are used, use pre-drilled holes following the standard tap drill sizes for American Standard Screw Threads to produce approximately 75% full thread. To prevent stripping of screws, do not turn past the point of setting the head.

surface finishes

Fyrcor panels are available in standard sanded finishes. Finer finishes are available on M.T.O. basis.

Primed surfaces are available, either inorganic — green tint, or organic — blue tint.

painting

Interior finishes are to be applied recognizing the need for alkali resistant priming or coating systems. Latex paint can be used directly over the Fyrcor. Solvent systems of chlorinated rubber base paints can also be applied directly to the board. Other types of paints require primers similar to those used over plastered walls. Consult the paint manufacturers for desired finishes.

specification compliances

Maritime Administration Specification 32-MA-5A, Fyrcor 36 only

U.S. Coast Guard 164.008/46/0, Fyrcor 36 only

Underwriters' Laboratories, Inc. Procedures File R4353.

OWENS/CORNING FIBERGLAS

OWENS-CORNING FIBERGLAS CORPORATION
Foam Products Division
Fiberglas Tower, Toledo, Ohio 43659

Pub. No. 1-UF-24[illegible]-A Litho in U.S.A. March 1972

A.I.A. No. 37-D-3

OWENS-CORNING FIBERGLAS

INSULATING CEMENTS

OC-110
ALL-PURPOSE
Temp. to 1000° F.

Forming a highly effective heat barrier and seal, OC-110 is a combination finishing and insulating cement for all types of heated equipment and fittings, and is a finish coat over insulation or OC-660 Insulating Cement. It forms an excellent bond to base metal or to insulating blocks and other types of industrial insulating materials. When used as the only insulating material, it builds readily into a coating as much as 1" thick, in a one-coat application, for complex valve and piping installations.

OC-110 shortens installation time and decreases equipment down time—delivering important maintenance economies. With its wide range of applications and ease of use, OC-110 should be stocked as a plant's all-purpose, utility cement for nearly every application with temperatures up to 1000° F.



OC-110 builds quickly into a tight, thick layer on most surfaces, forming a highly efficient heat barrier

IMPORTANT ADVANTAGES

SINGLE COAT APPLICATION
The fine adhesiveness and cohesiveness of OC-110 permits it to be readily worked into layers as deep as 1" without reinforcement. Only on thicker layers is wire mesh reinforcement desirable.

NO CRACKING WORRIES
Applied at any temperature above 32° F, OC-110 sets without tendency to cracking, and resists cracking as the equipment reaches operating temperatures. In fact, heat will speed its drying. Because shrinkage is so slight in the setting and heating of OC-110, no repointing is required.

SELF-FINISHING SURFACE
You can quickly apply OC-110, point, seal and have a smooth, even, light-reflecting surface that requires no further finish on interior installations. Outdoors it is recommended that OC-110 all-purpose cement be given a permanent, weatherproof coating.

READILY PAINTED
As soon as OC-110 dries, it can be painted with most oil-based materials. Additional coats of water-base paints may be applied, if desired.

VERY FAST SETTING
Within two and a half hours after application, OC-110 withstands rain or moisture without softening.

PREFERRED BY MECHANICS
OC-110 All Purpose Cement is clean in appearance and clean in handling. It can be worked easily and rapidly around the most intricate piping or across broad surfaces.

VERY FAVORABLE "k" FACTOR
Heat loss through OC-110 All-Purpose Cement is comparatively slow, giving it exceptionally favorable operating advantages. At 200° F mean temperature, for example, the "k" factor is .50.

OC-110 IS EXCELLENT FOR THESE AND SIMILAR APPLICATIONS

glass and ceramic kilns	breechings	steam cylinders	turbines
valves and fittings	digestors	air preheaters	piping
storage tanks	stills	hot air and gas ducts	ovens

A.I.A. No. 37-D-3

OWENS-CORNING FIBERGLAS

INSULATING CEMENTS OC-110

PHYSICAL CHARACTERISTICS

SERVICE TEMPERATURE
Up to 1000° F.

THERMAL CONDUCTIVITY

Mean Temperature	"k" Factor
200° F.	0.50
400° F.	0.63
600° F.	0.77
800° F.	0.90

WET COVERAGE
38-40 sq. ft./1 in. thick per 100 pounds

DRY COVERAGE
38-40 sq. ft./1 in. thick per 100 pounds

WATER-CEMENT RATIO BY WGT.
7/8 (6-8½ gal. per 50 lb. dry cement)

VOLUMETRIC SHRINKAGE (Wet to Dry)
Negligible

GREEN SET
2 to 2½ hours

ADHESIVE STRENGTH
Exceptionally good to insulating materials, bare metal and insulating cements

DENSITY (Installed)
32 lb./cu. ft.

COMPRESSIVE STRENGTH
238 psi at 10% deformation

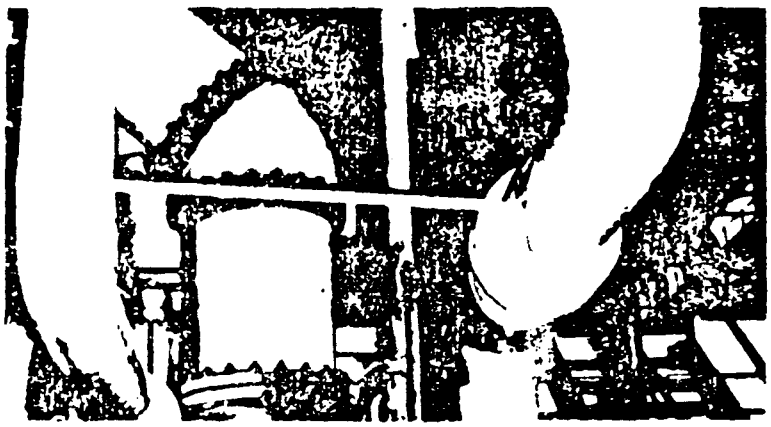
FIRE RESISTANCE
Incombustible

CORROSIVENESS
Does not cause corrosion. Contains rust inhibitor

WATER & MOISTURE RESISTANCE
Does not soften after green set

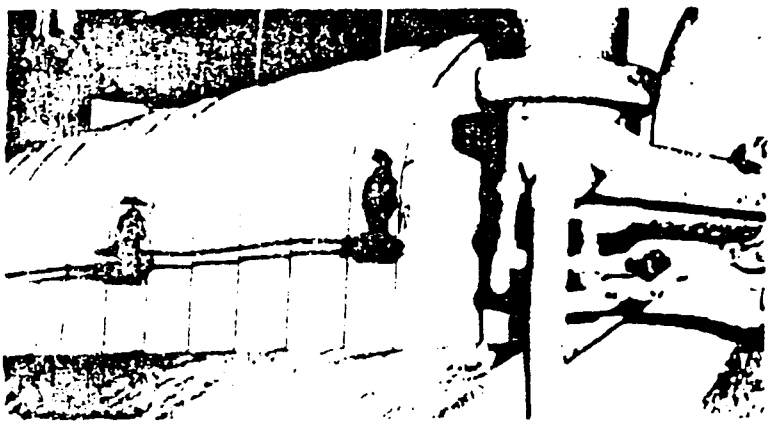
SURFACE TREATMENT
Easily painted

PACKAGING
50 lb. net, Multi-Wall Kraft paper bags



OC-110 All-Purpose Insulating Cement has been used as a finishing treatment on this partially insulated boiler. Next it will be applied to the tube-ends from the steam drum.

This is how OC-110 All-Purpose Insulating Cement will appear—applied and canvassed—on steam piping in a medium-sized power house.



INSULATE AND FINISH WITH ONE COAT



Troweling OC-110 on blanket insulation of a tank. Desired thickness will be obtained in one coat, saving time and money.

Owens-Corning Fiberglas* OC-110 Insulating Cement is used in two basic ways: first, to provide a finishing treatment on exposed insulation surfaces, sealing joints and crevices of blanket insulation and similar materials; second, to act as the primary insulating medium on valves, fittings and other surface areas where the one-inch unreinforced layer that can be formed meets the desired insulation requirements. If required, OC-110 can be applied much heavier with reinforcement. OC-110 will bond well, set within 2½ hours and resist softening by moisture after this period. As a finishing cement, it smooths to a firm, crack-free, light-reflecting surface requiring no further coating, except in outdoor installations.

*T-M (Reg. U. S. Pat. Off.) O-C F Corp.

Look in the yellow pages for your Fiberglas Approved Insulation Contractor or Fiberglas representative.

OWENS-CORNING FIBERGLAS

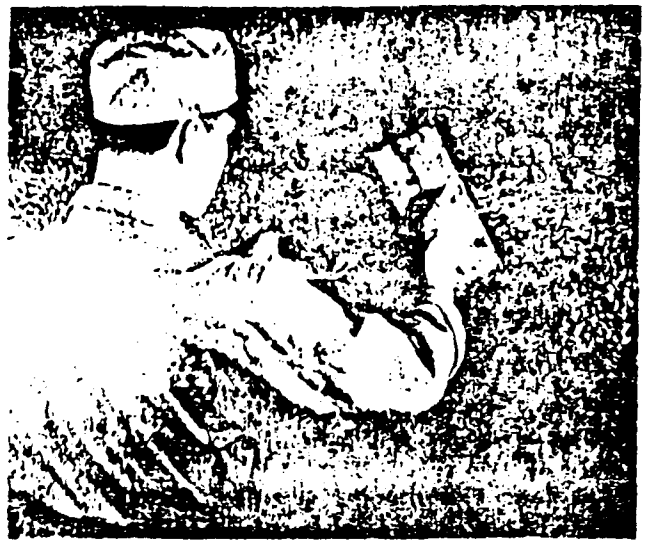
OWENS-CORNING FIBERGLAS CORPORATION

GENERAL OFFICES AND GENERAL PRODUCTS DIVISION • TOLEDO 1, OHIO
TEXTILE PRODUCTS DIVISION • 500 MADISON AVE. • NEW YORK 22, N. Y.
PACIFIC COAST DIVISION • SANTA CLARA, CALIFORNIA

OWENS-CORNING FIBERGLAS

OC-660 mineral wool insulating cement

for temperatures up to 1800° F



The unique and outstanding insulating material is suitable for almost every type of housed or unhoused heated equipment (with proper surface protection) up to 1800° F. It actually gains in thermal efficiency after exposure to temperatures over 1200° F. The exceptional plasticity and adhesiveness make it suitable for easy, quick and thorough application on all types of surfaces where other insulating cements are difficult or impossible to use. It is also rust-inhibitive, and completely reclaimable at temperatures under 1200° F. Available in 50 lb. bags.

OWENS-CORNING FIBERGLAS

INSULATING CEMENTS OC-660

PHYSICAL CHARACTERISTICS

SERVICE TEMPERATURE
Up to 1800° F

THERMAL CONDUCTIVITY

Mean Temperature	"k" Factor
100° F.	0.49
500° F.	0.74
800° F.	1.06

WET COVERAGE
60-65 sq. ft. 1 in. thick per 100 lbs

DRY COVERAGE
50-55 sq. ft. 1 in. thick per 100 lbs.

WATER-CEMENT RATIO BY WGT.
11/5 (11 to 12 gal. per 50 pounds dry cement)

VOLUMETRIC SHRINKAGE
18½ per cent in volume only

GREEN SET
Dry set only

INSTALLED DENSITY
22 to 24 lbs /cu. ft

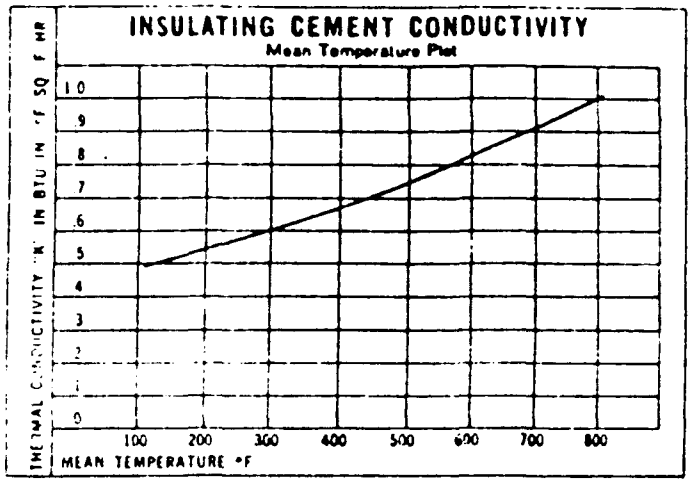
ADHESIVE STRENGTH
7½ psi at 10 per cent deformation

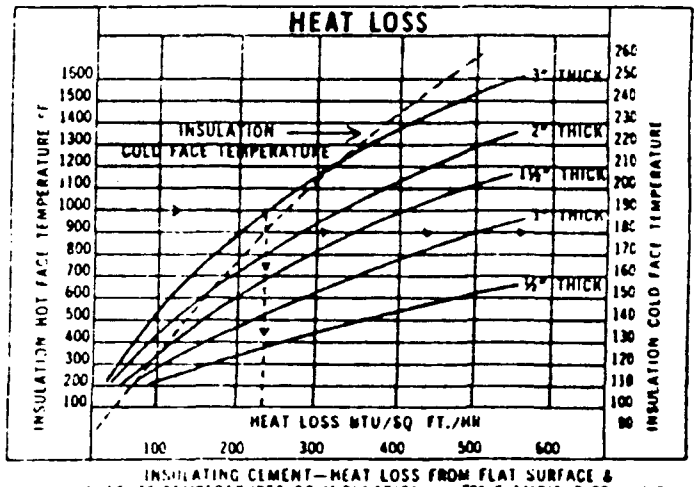
FIRE RESISTANCE
Incombustible

CORROSIVE QUALITY
Does not cause corrosion. Contains rust inhibitor.

SURFACE TREATMENT
Finishing cement

PACKAGING
50 lb. Multi-Wall Kraft paper bags





INSULATING CEMENT—HEAT LOSS FROM FLAT SURFACE & SURFACE TEMPERATURES OF INSULATION 70° F AMBIENT STILL AIR

HEAT LOSS—SURFACE TEMPERATURES

From *Insulation Hot Face Temperature* (1000° F.) read across to thickness curve (3"). From point of intersection read down to get *Heat Loss* figure (230 BTU). For *Cold Face Temperature*, read up from *Heat Loss* (230 BTU) to *Insulation Cold Face Temperature* curve. From point of intersection, read across to *Insulation Cold Face Temperature* (182° F.). All data at 70° F. ambient still air.

OC-660 IS EASY TO APPLY

1. Free surface of dirt, oil and loose scale.
2. Add 12 to 14 gal. of clean water to 50 lb. of OC-660.
3. Cement is now wet enough to provide correct adhesiveness and easy application. Wetting surface is not required.
4. When applying to equipment "spot" the initial coat. Then fill between "spots" for complete coverage. Build each coat to approximately one inch thick and allow to dry. Trowel final coat to a smooth surface. Make sure each coat is dry before applying the next.
5. If surface is kept hot during installation, the job can be done more quickly.
6. Outdoor application must be protected from the weather with a weatherproofing coating or jacket. Make sure cement is dry before application.



1. "Spotting" one-inch layer by hand. Layers go on faster on heated equipment.



2. Troweling final coat to desired smoothness. If no reinforcement is to be used the job is completed. A hard, smooth paintable finish can be obtained with an additional coat of finishing cement.



3. Wire mesh reinforcement can be installed on outside of exterior application to give the finishing treatment added strength.



4. Finishing layer being smoothed. When the finish layer is dry, a hard finish coat may be applied, forming a uniform covering which presents no voids where heat can escape.

Look in the yellow pages for your Fiberglas Approved Insulation Contractor or Fiberglas representative.

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PACIFIC COAST DIVISION • SANTA CLARA, CALIFORNIA

AIA No. 37-D-3

OWENS-CORNING FIBERGLAS

INSULATING CEMENTS

Type: OC-660
MINERAL WOOL
Temp. to 1800° F.

This Owens-Corning Fiberglas® *insulating cement* materially improves the thermal efficiency of equipment and process. It forms a highly permanent heat barrier on virtually every kind of surface with face temperatures up to 1800° F. Its resilient structure of high-temperature mineral-wool balls, enclosing thousands of microscopic air cells, has exceptionally low heat conductivity. In addition, OC-660 is rust-inhibiting, reclaimable up to 1200° F. and easy to apply.



OC-660 HAS THESE MAJOR ADVANTAGES

WIDE APPLICATION

OC-660 is designed for surfaces varying from boiler shells to chemical reactors. Its exceptional plasticity and adhesiveness make it lasting, as well as easy to apply, on surfaces that defy satisfactory application of other insulating cements. Because it maintains an excellent thermal efficiency all the way up to its upper use limit, 1800° F., OC-660 can be used and stocked as an all-purpose insulating cement, replacing several limited-use types.

EASE OF APPLICATION

Quick and simple to apply, even faster on hot equipment, OC-660 is a product that every insulation applicator finds easy to use. He will take added pride in the finished task, and the result will be a complete, thorough job, less down time and better insulated equipment.

BARRIER TO CORROSION

When properly applied to iron or steel surfaces, OC-660 does not cause corrosion and is, in fact, an excellent rust inhibitor. Examine these test panels.



1. Polished steel plate before test

2. Plate subjected to room temperatures for several weeks after being coated with ordinary plastic insulating material. Surface is pitted and corroded at end of test.

3. Plate coated with OC-660 applied wet and subjected to same test. Note that surface has not deteriorated

RECLAIMABILITY

For equipment requiring frequent, or even occasional, repair OC-660 provides an added economy. It can be stripped from the equipment, mixed with water and reused repeatedly, so long as the use-temperature has not exceeded 1200° F.

HIGH COVERAGE

OC-660 is a low density product that gives very high dry coverage per unit weight: 50 to 55 sq. ft., 1 in. thick per 100 pounds.

EXCELLENT FOR THESE AND SIMILAR APPLICATIONS

- Annealing pit covers
- Air preheaters
- Digestors
- Paper mill roll ends
- Laundries, ironer shoes
- Boiler drums
- Boiler headers
- Boiler shells
- Boiler settings
- Turbines
- Convectors
- Pumps
- Valves and fittings
- Feedwater heaters
- Heat exchangers
- Economizers
- Blast furnaces
- Hot air furnaces
- Melting furnaces
- Heat-treating furnaces
- Drying ovens
- Annealing ovens
- Heat-treating ovens
- Hot water tanks
- Oil storage tanks
- Hot tar tanks
- Hot chemical tanks
- Steam cylinders
- Steam generators

AIA No. 37-D-3

OWENS-CORNING FIBERGLAS

O-C 660 Insulating Cement

Fiberglas O-C 660 Mineral Wool Insulating Cement is an outstanding insulating material suitable for practically any type of heated equipment operated at temperatures up to 1800° F. Because of its unusual structure, Fiberglas O-C 660 can be applied quickly and easily as a plastic; yet it dries forming a cellular, highly efficient insulation. Fiberglas O-C 660 has unusually high dry coverage. 50 to 55 sq. ft. 1 inch thick per 100 lbs. and very low shrinkage. (Approx. 8.5% by volume @ 1800° F.)

To use these charts for Fiberglas O-C 110 All Purpose Insulating-Finishing Cement simply add 20% to the figures below.

APPROXIMATE POUNDS OF FIBERGLAS O-C 660
REQUIRED TO INSULATE STANDARD FLANGED FITTINGS TO VARIOUS THICKNESSES
(Including Companion Flanges Bolted to Fittings)

Nominal Pipe Diam. (Inches)	FLANGED COUPLING				90 DEGREE ELBOW				LONG RADIUS ELBOW				TEE				CROSS			
	Thickness of Fiberglas O-C 660				Thickness of Fiberglas O-C 660				Thickness of Fiberglas O-C 660				Thickness of Fiberglas O-C 660				Thickness of Fiberglas O-C 660			
	1"	2"	3"	4"	1"	2"	3"	4"	1"	2"	3"	4"	1"	2"	3"	4"	1"	2"	3"	4"
1	1.2	3.3	6.3	10.4	2.8	8.1	15.7	26.0	3.2	9.0	18.0	29.0	4.4	12.5	24.4	40.0	5.8	16.4	32.0	51.6
1-1/4	1.3	3.4	6.5	10.5	3.1	8.5	16.1	26.2	3.5	9.6	18.3	30.0	4.8	13.0	25.0	41.0	6.3	17.2	33.0	53.0
1-1/2	1.5	4.0	7.4	12.0	3.6	10.0	18.2	30.0	4.1	11.0	21.0	34.0	5.6	15.0	29.0	46.0	7.3	20.0	37.0	60.0
2	2.0	5.0	9.2	14.5	4.6	12.2	22.5	35.5	5.3	13.6	25.0	40.0	7.3	19.0	35.0	55.0	9.5	25.0	45.0	71.0
2-1/2	2.3	5.8	10.4	16.0	5.7	14.2	26.0	40.0	6.3	16.0	28.0	44.0	8.7	22.0	39.0	62.0	11.3	28.0	51.0	80.0
3	2.5	6.0	11.0	16.2	6.2	15.0	26.6	41.0	7.0	17.0	30.0	46.0	9.5	23.0	41.0	63.0	12.3	30.0	53.0	82.0
3-1/2	2.8	7.0	12.0	18.0	7.5	18.0	31.3	48.0	8.2	20.0	35.0	53.0	11.3	27.0	47.0	72.0	15.0	35.0	62.0	94.0
4	3.3	7.8	13.5	21.0	8.7	20.5	35.4	54.0	10.0	23.0	40.0	60.0	13.3	31.3	54.0	82.0	17.2	41.0	71.0	107.0
4-1/2	3.6	8.3	14.3	22.0	9.5	22.2	38.0	57.0	11.0	25.0	43.0	64.0	14.6	34.0	59.0	88.0	19.0	44.0	76.0	114.0
5	3.9	9.0	15.0	23.0	10.5	24.2	41.0	61.0	12.0	28.0	47.0	69.0	16.0	37.0	63.0	94.0	21.0	48.0	82.0	122.0
6	4.2	10.0	16.0	24.0	12.0	27.0	45.0	66.0	14.0	32.0	53.0	77.0	18.2	41.0	69.0	101.0	24.0	53.0	88.0	130.0
8	5.4	12.0	20.0	28.0	15.6	35.0	57.0	82.0	19.0	43.0	70.0	100.0	24.2	52.0	86.0	124.0	31.0	67.0	109.0	157.0
10	7.5	16.3	27.0	38.0	22.3	49.0	79.0	112.0	27.0	59.0	95.0	136.0	34.0	73.0	119.0	169.0	43.0	93.0	150.0	215.0
12	10.0	21.0	33.0	46.0	28.3	61.0	97.0	138.0	36.0	76.0	122.0	172.0	43.0	91.0	146.0	207.0	54.0	116.0	185.0	262.0

TABLE SHOWING APPROXIMATE QUANTITY (Pounds)
OF FIBERGLAS O-C 660 PLASTIC INSULATION
PER AVERAGE FITTING WITHOUT FLANGES

PIPE SIZE	INSULATION THICKNESS						
	1"	1-1/2"	2"	2-1/2"	3"	3-1/2"	4"
1/2"	.730	1.470	2.560	3.665	6.342	9.009	12.216
3/4"	.856	1.695	2.826	4.575	7.032	9.849	13.336
1"	.980	1.920	3.092	5.285	7.722	10.689	14.456
1-1/2"	1.280	2.319	4.228	6.435	9.162	12.649	16.248
2"	1.546	3.171	5.148	7.635	10.842	14.217	18.040
2-1/2"	2.114	3.861	6.108	9.035	12.186	15.785	20.040
3"	2.574	4.581	7.228	10.155	13.530	17.537	22.040
3-1/2"	3.054	5.421	8.124	11.275	15.030	19.285	24.040
4"	3.614	6.093	9.020	12.525	16.530	21.035	26.040
4-1/2"	4.062	6.765	10.020	13.755	18.030	22.785	29.432
5"	4.510	7.515	11.020	15.025	19.530	25.753	32.816
6"	5.510	9.015	13.020	18.395	24.612	31.675	39.584
8"	8.204	13.575	19.792	26.510	33.936	42.077	50.920
10"	11.312	18.033	25.460	34.245	43.998	54.6	66.4
12"	14.666	23.451	33.20	41.5	54.000	65.8	77.6
14"	18.0	28.05	38.8	51.5	65.4	80.5	96.0
16"	21.8	34.35	48.0	63.5	79.8	97.3	116.0
18"	26.5	41.64	58.0	76.0	95.4	106.4	138.4
20"	31.8	49.80	69.2	91.5	115.2	140.7	168.0
22"	38.3	60.24	84.0	109.0	135.0	163.1	192.0
24"	45.0	69.75	96.0	124.0	153.0	184.1	216.0
26"	51.0	78.75	108.0	139.0	171.0	205.1	240.0
28"	57.0	87.90	120.0	154.0	189.0	226.1	264.0
30"	63.0	96.90	132.0	169.0	207.0	247.1	288.0
36"	81.0	123.75	168.0	214.0	261.0	306.6	352.0

TABLE SHOWING APPROXIMATE QUANTITY (Pounds)
OF FIBERGLAS O-C 660 PLASTIC INSULATION
PER FLANGED COUPLING

PIPE SIZE	INSULATION THICKNESS						
	1"	1-1/2"	2"	2-1/2"	3"	3-1/2"	4"
1/2"	.954	2.016	3.364	4.725	6.732	9.408	11.792
3/4"	1.150	2.271	3.572	5.170	7.398	9.863	12.384
1"	1.344	2.523	3.780	5.610	8.064	10.318	12.976
1-1/2"	1.682	2.835	4.488	6.720	8.844	11.354	13.768
2"	1.890	3.366	5.376	7.370	9.732	12.047	14.56
2-1/2"	2.244	4.032	5.896	8.110	10.326	12.74	15.76
3"	2.688	4.422	6.488	8.605	10.92	13.79	16.96
3-1/2"	2.948	4.866	6.884	9.10	11.82	14.84	18.16
4"	3.244	5.163	7.28	9.85	12.72	15.89	19.28
4-1/2"	3.442	5.46	7.88	10.60	13.62	16.87	21.36
5"	3.64	5.91	8.48	11.35	14.46	18.69	23.36
6"	4.24	6.81	9.64	13.35	17.52	22.26	27.44
8"	5.84	9.54	13.72	18.40	23.52	29.19	35.28
10"	7.84	12.51	17.64	22.55	27.66	32.9	38.4
12"	9.22	14.1	19.2	25.5	32.4	39.9	48.0
14"	10.8	17.1	24.0	31.0	38.4	46.2	54.4
16"	12.8	19.8	27.2	35.5	43.8	52.5	61.6
18"	14.6	22.5	30.8	40.0	49.2	59.5	69.6
20"	16.4	25.5	34.8	45.5	56.4	67.7	80.0
22"	18.8	29.1	41.2	51.5	63.0	75.6	88.0
24"	21.0	32.4	44.0	57.5	72.0	87.5	104.0
26"	24.0	37.5	52.0	67.0	82.8	99.4	116.0
28"	27.6	42.6	58.0	76.0	94.8	114.8	136.0
30"	31.6	49.2	68.0	88.5	109.8	132.3	156.0
36"	48.0	75.8	106.0	139.0	174.0	210.0	248.0

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...INGHAM 13, ALA. ..... P. O. Box 9187
... 510 South 9th Street
... MASS. ... Office Bldg.
... CENTER ... Office Bldg.
... Hodge Building
... 12 Berman Building, Virginia St.
... Johnston Building
... 3236 Pure Oil Building
...AGO COM. CENTER ... 3236 Pure Oil Bldg.
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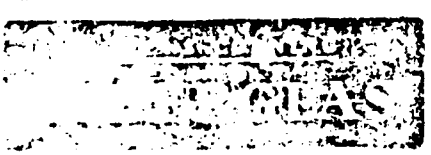

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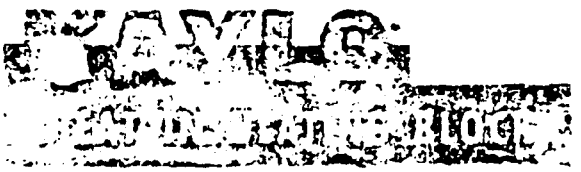

- Effective at temperatures up to 1200°F.
- Low coefficient of conductivity
- Water does not break it down
- Light, easy to handle, easy to fabricate

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