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

OWENS CORNING
FIBERGLAS

PIPE INSULATIONS

Pipe Insulations

a complete line of pipe and tubing insulations for temperatures from minus 120 F to 1800 F

January, 1962

PIPE INSULATIONS FIBERGLAS A.I.A. FILE NO. 37-D

OWENS-CORNING
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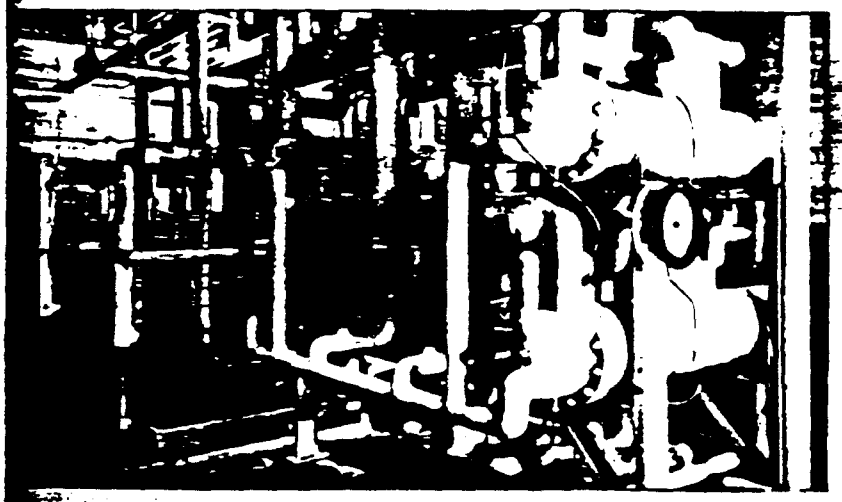
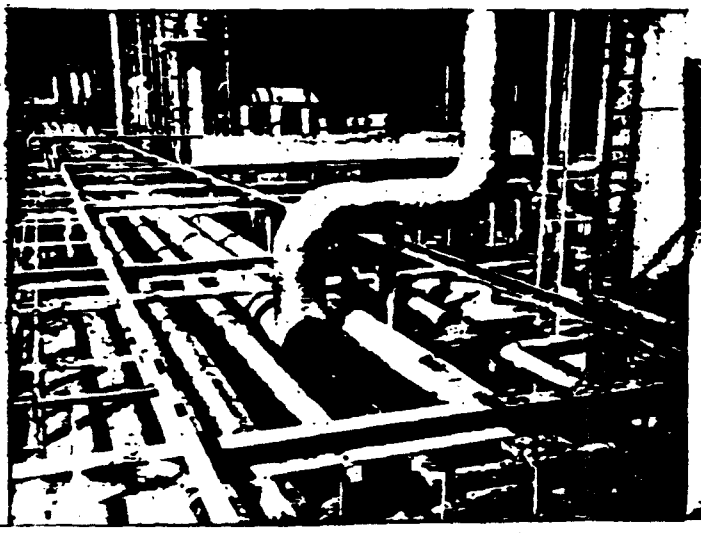


Fiberglas Pipe Insulation indoors for a neat, attractive appearance.

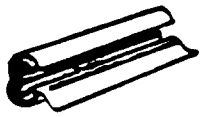
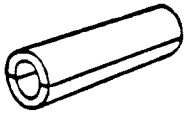
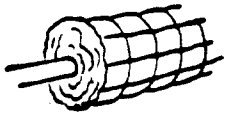
Applied either indoors or outdoors, Fiberglas Pipe Insulations assure superior performance and durability in all temperature ranges. Each of the eight product types offered in the Selector Guide opposite is the result of special engineering research and design to meet each particular use requirement. Manufactured to exacting standards, these fine Fiberglas products have proven their merit through years of industrial experience.

Fiberglas Pipe Insulation outdoors in large refinery.



pipe insulations

selection guide

requirements	service* temperature	product	available thickness	standard sizes	page
for indoor and outdoor hot lines	up to 450 F	 canvas and metal jacketed pipe insulation	nominal 1", 1½", 2", 2½" in single layer; any thickness possible with multiple layer	iron pipe sizes— ¼" to 33" copper tubing sizes—½"-6⅛" o.d. in 3' sections	4
for heated dual-temperature, chilled and ice water, brine refrigerant and special process lines or where a fire-retardant jacket is required	—120 F to 450 F	 vapor barrier fire retardant jacket (FRJ) or Dual Temp.	nominal 1", 1½", 2", 2½" in single layer; any thickness possible with multiple layers	iron pipe sizes— ¼" to 33" copper tubing sizes—½" to 6⅛" o.d. in 3' sections	4
for cold water, hot water and low pressure steam lines	up to 250 F	 low pressure pipe insulation	nominal ½"	iron pipe sizes— ¼" to 12" copper tubing sizes—½" to 4⅛" o.d. in 3' sections	8
cold water lines	down to 50 F				
for hot, cold and dual temperature lines	—30 F to 400 F	 multi-purpose one-piece pipe insulation	nominal ½", ¾" 1", 1½", 2" in single layer; any thickness possible with multiple layers	iron pipe sizes— ½" to 33" copper tubing sizes—1" to 6⅛" o.d. in 3' sections—6' sections over 6" IPS	14
for dual temperature chilled, refrigerant and ice water lines	0 F to 220 F	 O-C flexible and rigid tubing insulation	⅜", ½", ¾"	for iron pipe and copper tubing ¼" I.D. to 4" IPS in 6' lengths	16
for high temperature indoor and outdoor lines and super temperature steam lines	up to 1200 F (standard Kaylo)	 Kaylo, Kaylo-20 and Kaylo Klad pipe insulation	nominal 1", 1½", 2", 2½", 3" in single layer; any thickness possible with multiple layers	iron pipe sizes— ½" to 30" copper tubing sizes—½" to 3⅛" o.d. in 3' sections	18
	1200 F to 1800 F (Kaylo 20)				22
high pressure steam traced and nested lines	up to 1000 F	 blanket type pipe insulation	1", 1½", 2", 2½", 3", 4"	iron pipe sizes— 3" to 36" Blankets are 24" wide	24

* Service temperatures are for the jacket and insulation for requirements shown.

OWENS-CORNING FIBERGLAS CORP.

OWENS-CORNING

FIBERGLAS heavy density sectional pipe insulation

for hot and cold lines from minus 120 F to 450 F

DESCRIPTION

Fiberglas Sectional Pipe Insulation is a precision molded pipe covering composed of Fiberglas wool resin bonded and formed in two half cylinders at a density of 7½ lbs. cu. ft. It is available in three foot long sections to fit all types of pipe and tubing from ¼" IPS to 33" operating at temperatures from minus 120 F up to 450 F. A variety of jackets for appearance, vapor barrier, fire proofing or waterproofing permit selection of this many-purpose insulation for a specific end use either indoors or out, cold or hot line applications. Thicknesses follow Simplified Dimensional Standards to permit nesting for double layer application.

ADVANTAGES

This inorganic pipe insulation offers superior thermal efficiency.

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

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

Close manufacturing tolerances assure uniform wall thicknesses and close fitting to the pipe. The glass fibers 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, painting base, vapor barrier, fire retardant and weather protection. The selection of a particular end use determines the jacket to use.

FRJ (Fire Retardant Jacket)—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 neat finished appearance. It is composed of one layer 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 jacketing material makes Fiberglas FRJ Sectional Pipe Insulation the ideal material for commercial and industrial low and dual-temperature piping operating up to 450 F.

CANVAS

Fiberglas Sectional Pipe Insulation is available with a standard weight or 6 or 8 oz. canvas jacket to serve as a base for field painting. Aluminum bands are furnished at additional cost.

ROOFING FELT—for outdoor lines

Where Fiberglas Sectional Pipe Insulation requires protection from the weather, it is available with 3 factory applied weights of roofing applied to the [illegible] ends and joint sealing strip is provided. Aluminum bands are available at slight extra cost.

SIZES

Iron pipe (IPS)—¼" to 33"

copper tubing (CT)—½" O.D. to 6⅛" O.D.

insulation thicknesses—1", 1½", 2"*, 2½"* in single layer depending on pipe size. See table on page 6. Made to simplified dimensional standards for nesting in multiple layer applications.

section length—3'

*Iron pipe size only.

LIMITATIONS

temperature limit—Should not be used on pipes operating above 450 F.

low temperature usage—Must have vapor barrier jacket to prevent condensation when used on low temperature lines.

tolerances—All values given are subject to normal manufacturing and testing tolerances.

protection—Should be protected from mechanical damage in locations where severe abuse is likely. Canvas and vapor barrier jackets require weatherproofing when located outdoors.

physical properties

density:
nominal density 7½ lbs. per cubic foot

moisture absorption:
0.2% by volume—96 hrs. at 120 F and 95% RH

capillarity:
negligible (after 24 hours)

alkalinity:
pH 9

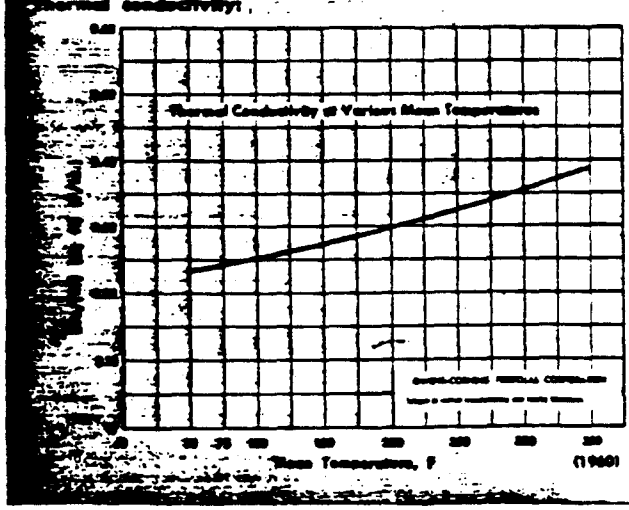
specific heat:
0.20 Btu/lb. F

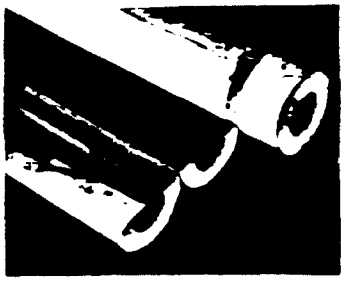
thermal diffusivity:
0.015 sq. ft. per hr. at 75 F mean temperature

Thermal diffusivity is used when both thermal conductivity and heat capacity are involved and may be defined as thermal conductivity divided by the specific heat and density.

The property of thermal diffusivity is important in the choice of an insulation wherever a condition of unsteady heat flow exists. For insulation of equal thickness the heating time is inversely proportional to diffusivity. For materials of the same diffusivity heating time is directly proportional to the square of the thickness.

thermal conductivity:



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 on pipe sizes up to 12" in standard, 6 or 8 oz. weight, factory applied, complete with longitudinal and end joint laps. Aluminum bands furnished at slight additional cost. Additional weatherproofing is required for piping located outdoors.	Insulation is applied to piping and canvas pasted smoothly over laps. Bands may be used for additional mechanical fastening or for appearance. Insulation for piping over 12" is wired in place and subsequently covered with field applied canvas. Fittings are insulated with fibrous glass molded fitting covers, or OC-110 Insulating Cement. Application details and fitting weatherproofing are outlined on pages 10 and 11.
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 a fire self extinguishing adhesive and reinforced with tough Fiberglas yarn. The exterior surface is coated white to present a neat appearance requiring no further surface finish for cold or heated lines. Vapor barrier perm rating is a low 0.01 perms — grains per hour per square foot per inch of mercury. Longitudinal joint sealing flap provided. End joint sealing tapes are supplied. Bands are available at slight additional cost.	Cold and dual-temperature piping and fittings require careful application of vapor barrier jacketed pipe insulation and sealing of fittings. For application details and specifications see pages 10 and 11. Thickness recommendations to prevent condensation and low temperature control for cold piping are shown on pages 6 and 7. Additional weatherproofing is required for piping located outdoors — details on pages 10 and 11.
Outdoor Lines to 450 F 	Fiberglas Pipe Insulation with factory-applied weather-resistant roofing jacket is recommended for outdoor lines operating at temperatures up to 450 F. Weatherproofing and insulation are applied in one step.	**Roofing Felt Jacket** Available with factory-applied 35, 45, or 55 lb. roofing felt jackets. Longitudinal joint flap provided. End joint sealing tapes supplied.	Insulation with integral weather-resistant jacket is wired in place. Side laps are turned down to shed water. End joints are sealed with end joint tape provided and securely wired in place. Further application details and weatherproofing of fittings are described on pages 10 and 11.
	Fiberglas Metal Jacket Pipe Insulation with factory applied embossed aluminum or smooth stainless steel jacketing is recommended for outdoor lines operating at temperatures up to 450 F. Weatherproofing and insulation are applied in one step.	**Metal Jacket** Fiberglas Metal Jacket pipe insulation with .016 embossed aluminum or .010 stainless steel factory-applied jackets have longitudinal seam joints and end joint bands with integral mastic. Fiberglas Metal Jacket is also available with .010 embossed aluminum facing, factory applied, without seam joints but with a three-inch overlap at longitudinal seam and 3" overlap on one end joint.	Metal Jacket with seam joint is applied by inserting flat edge into sealing joint in a four o'clock position on pipe to shed water. End joint strips with integral mastic are then attached at end joints and banded. Metal Jacket with .010 embossed aluminum is installed with 3" overlap at seams and joints. Bands or wires are attached securely in place at 18" intervals, two per 36" section. See pages 10 and 11.

heated piping to 450 F

Ambient 80 F

	For Commercial & Industrial Applications 110 F surface temp.												For Power & Utility Uses 130 F surface temp.								
gr. press.	to 25 psig.				to 100 psig.				to 235 psig.				to 25 psig.				to 100 psig.				
pipe temp.	to 367 F				to 338 F				to 400 F				to 267 F				to 338 F				
temp. diff.	187 F				258 F				320 F				187 F				258 F				
pipe sizes	RT*	ML	E	ST	RT*	ML	E	ST	RT*	ML	E	ST	RT*	ML	E	ST	RT*	ML	E	ST	RT*
½"	½"	24	80.5	103	1"	30	84.7	104	1½"	33	88.0	100	½"	30	75.6	116	¾"	36	81.6	2	1½"
¾"	½"	28	81.3	105	1"	37	84.8	111	1½"	38	88.7	102	½"	35	77.0	117	¾"	42	82.6	4	1½"
1"	½"	32	82.2	106	1"	38	86.8	107	1½"	42	89.5	105	½"	40	77.8	119	¾"	48	83.5	5	1½"
1¼"	½"	38	83.6	107	1"	48	86.9	112	1½"	46	91.0	102	½"	47	78.5	120	¾"	57	84.6	8	1½"
1½"	½"	42	84.0	108	1"	49	88.3	107	1½"	53	91.0	105	½"	57	79.0	121	¾"	63	85.0	10	1½"
2"	½"	49	84.8	109	1"	57	88.8	112	1½"	58	91.5	107	½"	63	80.3	122	¾"	74	85.5	120	1½"
2½"	½"	57	85.1	109	1"	67	89.0	111	1½"	76	91.0	112	½"	74	80.5	123	¾"	85	86.1	121	1½"
3"	½"	67	85.5	110	1"	80	89.2	111	1½"	79	93.0	107	½"	92	80.6	124	¾"	99	86.5	122	1½"
4"	½"	75	87.2	111	1"	96	89.6	112	1½"	96	88.5	109	½"	109	81.4	125	¾"	122	86.8	123	1½"
5"	1"	80	88.8	104	1½"	87	92.5	104	2"	105	87.9	105	½"	131	81.6	125	¾"	148	87.0	124	1½"
6"	1"	94	88.9	106	1½"	101	92.6	105	2"	106	94.5	103	½"	134	81.7	125	1"	137	89.9	5	1½"
7"	1"	105	89.1	105	1½"	110	92.8	104	2"	117	94.5	103	½"	175	81.7	125	1"	155	89.9	6	1½"
8"	1"	110	89.5	105	1½"	122	92.9	105	2"	133	94.4	105	½"	195	81.8	125	1"	164	90.6	115	1½"
9"	1"	122	89.5	105	1½"	136	93.0	105	2"	138	94.6	103	½"	208	81.8	125	1"	182	90.5	115	1½"
10"	1"	140	89.2	106	1½"	143	93.2	106	2"	160	94.6	103	½"	240	81.8	126	1"	208	90.4	116	1½"
11"	1"	140	90.0	104	1½"	150	93.5	105	2"	170	94.8	106	½"	246	81.8	126	1"	208	90.9	115	1½"
12"	1"	150	90.0	104	1½"	165	93.6	104	2"	178	94.8	105	½"	282	81.8	127	1"	220	91.2	113	1½"
14"	1½"	138	91.7	100	2"	148	93.9	99	2½"	160	95.8	99	1"	182	89.0	106	1"	274	89.8	117	1½"
16"	1½"	146	92.2	98	2"	170	94.1	100	2½"	188	95.6	101	1"	200	89.5	106	1"	296	90.4	118	1½"
18"	1½"	160	92.3	98	2"	190	94.3	101	2½"	205	95.5	102	1"	232	89.2	107	1"	342	90.2	119	1½"
20"	1½"	180	92.4	98	2"	207	94.4	100	2½"	227	95.8	102	1"	254	89.2	107	1"	374	90.2	118	1½"
24"	1½"	210	92.5	98	2"	240	94.5	101	2½"	266	95.8	102	1"	310	89.2	108	1"	464	90.2	122	1½"
30"	1½"	268	92.5	99	2"	310	94.5	101	2½"	325	96.0	102	1½"	268	92.5	99	1½"	390	93.0	107	1½"
36"	1½"	285	92.5	99	2"	329	94.5	101	2½"	344	96.6	102	1½"	285	92.5	99	1½"	440	93.0	107	1½"

cold and dual—Temperature piping—minus 120 F. to 200 F.

Ambient 90 F

	90% relative humidity												85% relative humidity							
pipe surface temperature	60 F		35 F		0 F		−30 F		−60 F		−120 F		35 F		0 F		−30 F		−60 F	
condition	chilled water		ice water		brine		special brine		refrig-erants		special process		ice water		brine		special brine		refrig-erants	
pipe sizes	RT*	MG	RT*	MG	RT	MG	RT	MG	RT	MG	RT	MG	RT	MG	RT	MG	RT	MG	RT	MG
½	1½	3.8	1½	5	2½	6	3	7	3½	7	4	10	1	6	1½	7	2	8	2½	9
¾	1½	4.3	1½	5	2½	6	3	7	3½	8	4½	10	1	7	1½	8	2	9	2½	10
1	1½	4.7	1½	6	2½	6	3	8	3½	9	4½	11	1	7	1½	8	2	10	2½	10
1¼	1½	5.3	2	6	2½	7	3	9	3½	11	4½	12	1	9	1½	9	2	11	2½	12
1½	1½	6.0	2	7	3	8	3½	8	3½	10	5	12	1	9	2	9	2½	11	3	12
2	1½	5.8	2	7	3	8	3½	10	4	11	5	13	1½	8	2	10	2½	12	3	14
2½	2	7.2	2	8	3	10	3½	11	4	12	5½	14	1½	11	2	13	2½	14	3	15
3	2	7.5	2	9	3	10	4	11	4½	13	5½	15	1½	11	2	13	2½	15	3	16
4	2	9.1	2	10	3	12	4	13	4½	15	6	18	1½	13	2	15	2½	17	3	19
5	2	10.6	2½	11	3½	13	4	15	4½	17	6	19	1½	16	2½	16	2½	20	3½	20
6	2	12.4	2½	12	3½	14	4½	16	5	18	6½	21	1½	18	2½	18	3	21	3½	22
7	2	13.8	2½	14	3½	15	4½	17	5	19	6½	22	1½	20	2½	20	3	22	3½	24
8	2	15	2½	15	3½	17	4½	18	5	21	6½	24	1½	21	2½	21	3	24	3½	27
9	2	16	2½	16	4	17	4½	20	5½	22	7	25	1½	24	2½	23	3	27	3½	30
10	2	17	2½	17	4	18	4½	22	5½	24	7	27	1½	26	2½	25	3	29	3½	32
11	2½	16	2½	19	4	20	4½	23	5½	25	7	28	1½	29	2½	28	3	31	3½	34
12	2½	17	2½	21	4	21	5	24	5½	26	7	30	2	25	2½	30	3	34	3½	36
14	2½	19	2½	23	4	23	5	28	6	27	7½	31	2	28	2½	33	3	38	4	37
16	2½	21	2½	25	4	25	5	28	6	29	8	32	2	32	2½	37	3	41	4	40
18	2½	24	2½	28	4	29	5	31	6	32	8	34	2	35	2½	41	3	46	4	45
20	2½	26	2½	31	4	31	5	33	6	35	8	38	2	38	2½	45	3½	45	4	49
24	2½	30	3	32	4½	33	5½	37	6	41	8	44	2	44	2½	54	3½	53	4	58
30	2½	37	3	32	4½	40	5½	43	6½	48	8	53	2	56	2½	64	3½	66	4	68
36	2½	40	3	45	4½	47	5½	51	6½	54	8	60	2	61	2½	72	3½	73	4	79
½	1½	3.5	1½	3.8																
¾	1½	3.2	1½	3.5																
½	1½	3.5	1½	3.8																
¾	1½	3.9	1½	4.2																
1½	1½	4.5	1½	50																
1¼	1½	4.9	1½	5.4																
1½	1½	5.6	1½	6.1																
2½	1½	6.0	2	5.8																
2½	2	6.3	2	6.8																
3½	2	6.6	2	7.6																
3½	2	7.8	2	8.5																
4½	2	7.9	2½	8.6																
5½	2	9.2	2½	9.6																
6	2	12.7	2½	11.3																

For Power Industries
160 F surface temp.

235 psig. to 400 F 320 F			to 25 psig. to 267 F 187 F			to 100 psig. to 338 F 258 F			to 235 psig. to 400 F 320 F		
HL	E	ST	RT*	HL	E	ST	RT*	HL	E	ST	RT*	HL	E	ST
48	82.6	120	½"	30	75.6	116	½"	48	78.0	127	½"	55	80.0	138
55	83.6	112	½"	35	77.0	117	½"	50	79.1	128	½"	63	81.2	140
64	84.0	124	½"	40	77.8	119	½"	57	79.9	131	½"	75	81.4	143
70	86.5	121	½"	47	78.5	120	½"	68	80.0	132	½"	88	82.9	145
66	88.8	118	½"	57	79.0	121	½"	79	81.1	133	½"	98	83.2	145
74	89.7	180	½"	63	80.3	122	½"	92	81.9	135	½"	118	83.5	145
89	89.7	119	½"	74	80.5	123	½"	107	82.2	136	½"	138	83.9	149
103	90.9	121	½"	92	80.6	124	½"	129	82.5	137	½"	165	84.3	151
126	90.3	122	½"	109	81.6	125	½"	159	82.9	138	½"	204	84.5	152
154	90.3	124	½"	131	81.7	125	½"	196	83.0	139	½"	250	84.5	154
182	90.3	127	½"	154	81.7	125	½"	233	83.1	140	½"	291	84.5	155
204	90.5	124	½"	175	81.8	125	½"	258	83.1	141	½"	330	84.5	156
214	91.1	123	½"	195	81.8	125	½"	285	83.2	141	½"	368	84.5	157
242	90.0	125	½"	208	81.8	125	½"	312	83.3	142	½"	406	84.8	158
270	91.0	126	½"	240	81.8	126	½"	360	83.3	143	½"	452	84.8	159
276	91.6	124	½"	246	81.8	126	½"	370	83.4	144	½"	491	84.9	159
290	91.7	124	½"	283	81.8	127	½"	410	83.4	145	½"	530	84.9	160
262	93.2	116	1"	182	89.0	106	1"	274	89.8	117	1"	364	90.4	129
284	93.5	114	1"	200	89.5	106	1"	296	90.4	118	1"	388	91.0	129
314	93.5	115	1"	232	89.2	107	1"	342	90.2	119	1"	448	90.8	130
350	93.5	115	1"	256	89.2	107	1"	374	90.2	118	1"	490	90.8	131
404	93.5	116	1"	310	89.2	108	1"	464	90.2	122	1"	540	90.8	132
520	93.5	116	1½"	268	92.5	99	1½"	390	93.0	107	1½"	520	93.5	116
570	93.5	117	1½"	285	92.5	99	1½"	440	93.0	107	1½"	570	93.5	117

* Minimum thickness available above 12" IPS is 1", above 24" IPS is 1½"

80% relative humidity

—120 F special process		40 F chilled water		35 F ice water		0 F brine		—30 F special brine		—60 F refrigerants		—120 F special process	
RT	HG	RT	HG	RT	HG	RT	HG	RT	HG	RT	HG	RT	HG
3	11	⅜	5.4	⅜	6	1	8	1½	9	1½	11	2	13
3	12	⅜	6.2	⅜	7	1½	8	1½	10	2	10	2½	13
3	13	¼	7.1	⅜	8	1½	8	1½	11	2	11	2½	14
3	15	⅜	8.4	1	9	1½	9	1½	12	2	14	2½	16
3½	14	⅜	9.4	1	9	1½	10	2	12	2	15	2½	18
3½	16	⅜	11.0	1	10	1½	12	2	13	2	16	2½	19
3½	17	¼	12.6	1	12	1½	15	2	16	2½	17	3	20
3½	20	1	12	1	14	1½	16	2	17	2½	18	3	21
4	21	1	14	1	16	1½	18	2	20	2½	21	3	25
4	24	1	16	1	20	1½	23	2	24	2½	25	3	29
4	27	1	21	1	24	2	21	2	27	2½	28	3	33
4	30	1	24	1	28	2	23	2	30	2½	31	3	36
4½	30	1	25	1	29	2	26	2	33	2½	34	3½	36
4½	33	1	27	1½	24	2	27	2	35	2½	37	3½	40
4½	36	1	32	1½	26	2	30	2	39	2½	41	3½	43
4½	38	1	32	1½	29	2	31	2	41	3	38	3½	45
4½	40	1	34	1½	32	2	36	2½	39	3	41	3½	48
5	41	1	41	1½	35	2	41	2½	44	3	46	3½	53
5	45	1	44	1½	39	2	45	2½	49	3	50	3½	58
5	50	1	52	1½	43	2	50	2½	54	3	56	3½	66
5	55	1	57	1½	48	2	55	2½	60	3	62	4	65
5	63	1	70	1½	55	2	64	2½	70	3	73	4	77
5½	70	1	82	1½	70	2	79	2½	83	3	88	4	92
5½	81	1	91	1½	77	2	88	2½	92	3	98	4	104
		⅜	4.0	⅜	4.3								
		¼	4.4	⅜	4.9								
		⅜	4.8	⅜	5.3								
		⅜	5.2	¼	5.8								
		¼	6.3	⅜	6.9								
		¼	7.2	⅜	7.8								
		⅜	8.0	¼	8.8								
		⅜	9.8	1	8.0								
		⅜	11.5	1	11.1								
		⅜	13.3	1	10.6								
		1	12.8	1	14.0								
		1	11.7	1	10.9								
		1	13.9	1	15.2								
		1	16.1	1	17.6								

* Minimum thickness available above 12" IPS is 1", above 24" IPS is 1½"

table key

RT—recommended thickness
HL—heat loss . . . Btu hr lineal foot
E—efficiency . . . % of bare pipe heat loss stopped
ST—surface temperature . . . insulation surface F

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. 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

True economic thickness can now be calculated quickly and easily by following the instructions in the Fiberglas DIVIDEND ENGINEERING "Economic Thickness Manual" available from your local Fiberglas branch office.

thicknesses for specific end use

The thicknesses shown here are generalized recommendations broken down by end use. On all but the smallest projects, it will pay to use the Dividend Engineering "Economic Thickness Manual" to calculate actual economic thickness.

In general, surface temperatures for the 3 sets of recommendations for heated piping were kept below values of 110 F for commercial, 130 F for power & utility and 160 F for process. Surface temperature, however, should not be the only criterion for selection of thickness as outlined above.

For cold piping, proper thickness is required for efficient operation and to prevent condensation on the insulation surface. Specifically:

1. Designed thickness should be specified to result in a surface temperature above the Dew-Point temperature of the surrounding air. Generally this is equal to or greater than the "economical thickness" despite the relatively higher cost of cold Btu's.

2. Insulation thickness should be based on ambient air conditions and corresponding permissible temperature differences.

Ambient Air Condition	Permissible temp. drop (between ambient air and insulation surface
90 F at 90% R.H.	3 F
90 F at 85% R.H.	5 F
90 F at 80% R.H.	7 F

3. Piping operating down to freezing temperatures or at fluctuating hot and cold temperatures should be insulated for maximum performance during the coolest part of the cold cycle.

See page 12 for service water & low pressure steam lines—LOW PRESSURE PIPE INSULATION.

thickness standards for Fiberglas Heavy Density Sectional pipe insulations

IP — iron pipe sizes

CT — copper tubing

single layer . . .

multiple layer . . . . . .

Nominal pipe size (IP)	O.D. (pipe)	nom. ½" O.D.	nom. ½" actual	nom. 1" O.D.	nom. 1" actual	nom. 1½" O.D.	nom. 1½" actual	nom. 2" O.D.	nom. 2" actual	nom. 2½" O.D.	nom. 2½" actual
⅛"	.440			2.92	1.18	3.50	1.50				
¼"	.675			2.93	1.13						
⅜"	.840	2.34	.75	2.88	1.02	4.00	1.58	5.00	2.08		
½"	1.050	2.55	.75	2.88	.91	4.00	1.48	5.00	1.98		
1"	1.315	2.85	.77	3.50	1.09	4.50	.59	5.56	2.12		
1¼"	1.660	3.28	.81	3.50	.92	5.00	1.67	5.56	1.95		
1½"	1.900	3.49	.80	4.00	1.05	5.00	1.55	5.56	1.83		
2"	2.375	3.97	.80	4.50	1.06	5.56	1.59	6.62	2.12		
2½"	2.875	4.47	.80	5.00	1.06	5.56	1.34	6.62	1.88		
3"	3.500	4.97	.74	5.56	1.03	6.62	1.56	7.62	2.06		
3½"	4.000	5.53	.77	6.62	1.31	6.62	1.31	7.62	1.81		
4"	4.500	6.00	.75	6.62	1.06	7.62	1.56	8.62	2.06		
4½"	5.000			7.62	1.31	7.62	1.31	8.62	1.81		
5"	5.562	7.06	.75	7.62	1.03	8.62	1.53	9.62	2.03		
6"	6.625	8.13	.75	8.62	1.00	9.62	1.50	10.75	2.06		
7"	7.625			9.60	1.00	10.75	1.56	11.75	2.06	12.75	2.56
8"	8.625			10.75	1.06	11.75	1.56	12.75	2.06	14.00	2.69
9"	9.625			11.75	1.06	12.75	1.56	14.00	2.19	15.00	2.69
10"	10.750			12.75	1.00	14.00	1.62	15.00	2.12	16.00	2.62
11"	11.750			14.00	1.12	15.00	1.62	16.00	2.12	17.00	2.62
12"	12.750			15.00	1.12	16.00	1.62	17.00	2.12	18.00	2.62
14"	14.000			16.00	1.00	17.00	1.50	18.00	2.00	19.00	2.50
15"	15.000			17.00	1.00	18.00	1.50	19.00	2.00	20.00	2.50
16"	16.000			18.00	1.00	19.00	1.50	20.00	2.00	21.00	2.50
17"	17.000			19.00	1.00	20.00	1.50	21.00	2.00	22.00	2.50
18"	18.000			20.00	1.00	21.00	1.50	22.00	2.00	23.00	2.50
19"	19.000			21.00	1.00	22.00	1.50	23.00	2.00	24.00	2.50
20"	20.000			22.00	1.00	23.00	1.50	24.00	2.00	25.00	2.50
21"	21.000			23.00	1.00	24.00	1.50	25.00	2.00	26.00	2.50
22"	22.000			24.00	1.00	25.00	1.50	26.00	2.00	27.00	2.50
23"	23.000			25.00	1.00	26.00	1.50	27.00	2.00	28.00	2.50
24"	24.000			26.00	1.00	27.00	1.50	28.00	2.00	29.00	2.50
25"	25.000					28.00	1.50	29.00	2.00	30.00	2.50
26"	26.000					29.00	1.50	30.00	2.00	31.00	2.50
27"	27.000					30.00	1.50	31.00	2.00	32.00	2.50
28"	28.000					31.00	1.50	32.00	2.00	33.00	2.50
29"	29.000					32.00	1.50	33.00	2.00	34.00	2.50
30"	30.000					33.00	1.50	34.00	2.00	35.00	2.50
31"	31.000					34.00	1.50	35.00	2.00	36.00	2.50
32"	32.000					35.00	1.50	36.00	2.00	37.00	2.50
33"	33.000					36.00	1.50	37.00	2.00	38.00	2.50
(Tubing)	(Tubing)										
⅜"	½"			2.88	1.19	3.50	1.50				
⅜"	⅝"	2.09	.78	2.88	1.13	4.00	1.69				
½"	⅞"	2.19	.72	2.88	1.06	4.00	1.63				
½"	1⅛"	2.31	.72	2.88	1.00	4.00	1.56				
1"	1⅜"	2.53	.70	2.88	.91	4.00	1.48				
1⅛"	1⅝"	2.81	.72	3.50	1.06	4.50	1.56				
1⅜"	1⅞"	3.25	.81	3.50	.94	4.50	1.68				
2"	2⅛"	3.44	.66	4.50	1.19	5.56	1.72				
2⅛"	2⅜"	3.97	.67	4.50	.94	5.56	1.47				
3"	3⅛"	4.47	.67	5.56	1.28	6.63	1.75				
3⅛"	3⅜"			5.56	.97	6.63	1.50				
4"	4⅛"			6.63	1.25	7.63	1.75				
5"	5⅛"			7.63	1.25	8.63	1.75				
6"	6⅛"			8.63	1.25	9.63	1.75				

Sectional

Tri Segmental

Note:

Insulation for Tubing Sizes of ¼" (⅜" O.D.) and ⅞" (1" O.D.) are available only as cut-downs from next larger size and will be slightly elliptical in shape.

*Factory applied 45 lb. and 55 lb. waterproof jackets not available on sizes above heavy lines starting at 2" IPS and 2½" CT.

design data

This table presents the actual thicknesses in which Fiberglas Low Temperature Pipe Insulation is available and should be used in the selection of thicknesses to fit pipe sizes to be insulated and the choice of nesting thicknesses for multiple layers. For design conditions other than indoor work consult the "Fiberglas Performance Data Book" (4-IN-2002) for the necessary applicable engineering data.

KEY TO TABLE

example

(4" nom. pipe size)

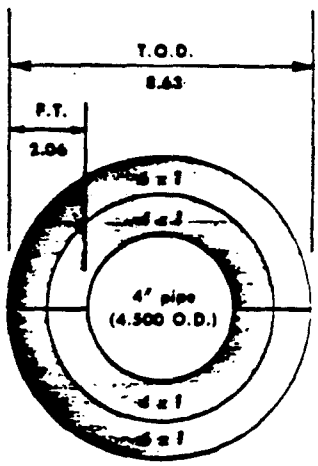
2"	
F.T.	T.O.D.
2.06	8.63
4 x 1, 6 x 1	

2"—nominal Fiberglas thickness

F.T.—total Fiberglas thickness

T.O.D.—total outside diameter

Italics—nominal thickness of each layer



how to order

iron pipe

Multiple-layer combinations specified in table are supplied nested in the same carton when ordered as multiple layer thickness, i.e. 10x4 M.L. Should other combinations be desired, insulation must be ordered by individual layers.

copper tubing

Multiple layer insulation on copper tubing is available but must be ordered and priced separately.

Choose suitable layers by locating iron pipe actual diameter which is equal to outside diameter of copper tubing insulation. Order combination by listing pipe size and thickness. For Example: 1⅝"x3" composed of 1⅝" O.D. x 1½" (CT) and 4" x 1½" (IPS).

Nominal pipe size	O.D. of pipe
⅛"	.840
¼"	1.050
⅜"	1.315
½"	1.660
¾"	1.900
1"	2.375
1¼"	2.875
1½"	3.500
2"	4.000
2½"	4.500
3"	5.562
3½"	6.625
4"	7.625
5"	8.625
6"	9.625
7"	10.750
8"	11.750
9"	12.750
10"	14.000
11"	15.000
12"	16.000
13"	17.000
14"	18.000
15"	19.000
16"	20.000
17"	21.000
18"	22.000
19"	23.000
20"	24.000
21"	25.000
22"	26.000
23"	27.000
24"	28.000
25"	29.000
26"	30.000

pipe insulations

from minus 120 to 450 F

combinations of single layers

Nominal Fiberglas thickness

2"		2½"		3"		3½"		4"		4½"		5"		6"	
P.T.	T.O.B.	P.T.	T.O.B.	P.T.	T.O.B.	P.T.	T.O.B.	P.T.	T.O.B.	P.T.	T.O.B.	P.T.	T.O.B.	P.T.	T.O.B.
2.06 ½x1 2½x1	3.00	2.36 ½x1 2½x1½	5.56	2.89 ½x1½ 3½x1½	6.63	3.39 ½x2 4½x1½	7.63	3.89 ½x2 4½x2	8.63	4.39 ½x1 2½x1½	9.63 5x2	4.95 ½x1½ 3½x1½	10.75 6x2	5.95 ½x2 4½x2	12.75 8x2
1.97 ¾x1 2½x1	3.00	2.28 ¾x1 2½x1½	5.56	2.79 ¾x1½ 3½x1½	6.63	3.29 ¾x2 4½x1½	7.63	3.79 ¾x2 4½x2	8.63	4.88 ¾x1½ 3½x1	10.75 6x2	4.88 ¾x1½ 3½x1½	10.75 6x2	5.95 ¾x2 4½x2	12.75 8x2
2.12 1x1 3x1	3.56	2.65 1x1 3x1½	6.63	3.15 1x1½ 4x1½	7.63	3.15 1x2 5x1½	8.63	4.15 1x2 5x2	9.63	4.72 1x1 3x1½	10.75 6x2	5.22 1x1½ 4x1½	11.75 7x2	6.34 1x2 5x2	14.00 9x2
1.98 1¼x1 3x1	3.56	2.48 1¼x1 3x1½	6.63	2.98 1¼x1½ 4½x1½	7.63	2.98 1¼x2 5x1½	8.63	3.98 1¼x2 5x2	9.63	4.84 1¼x1 3x1½	10.75 6x2	5.04 1¼x1½ 4½x1½	11.75 7x2	6.17 1¼x2 5x2	14.00 9x2
2.36 1½x1 3½x1	6.63	2.36 1½x1 3½x1½	6.63	2.86 1½x1½ 4½x1½	7.63	3.86 1½x2 5x1½	9.63	3.86 1½x2 5x2	9.63	4.62 1½x1 3½x1½	10.75 6x2	4.92 1½x1½ 4½x1½	11.75 7x2	6.05 1½x2 5x2	14.00 9x2
2.12 2x1 4x1	6.63	2.62 2x1 4x1½	7.63	3.12 2x1½ 5x1½	8.63	3.62 2x2 6x1½	9.63	4.19 2x2 6x2	10.75	4.69 2x1 4x1½	11.75 7x2	5.19 2x1½ 5x1½	12.75 8x2	6.31 2x2 6x2	15.00 10x2
2.37 2½x1 4½x1	7.63	2.37 2½x1 4½x1½	7.63	2.87 2½x1½ 5x1½	8.63	3.94 2½x2 6x1½	10.75	4.12 2½x2 6x2	10.75	4.64 2½x1 4½x1½	11.75 7x2	4.94 2½x1½ 5x1½	12.75 8x2	6.06 2½x2 6x2	15.00 10x2
2.06 3x1 5x1	7.63	2.56 3x1 5x1½	8.63	3.06 3x1½ 6x1½	9.63	3.62 3x2 7x1½	10.75	3.87 3x2 7x2	11.75	4.62 3x2 7x2½	12.75	5.25 3x1½ 6x1½	14.00 9x2	6.25 3x2 7x2	16.00 11x2
2.31 3½x1 6x1	8.63	2.81 3½x1 6x1½	9.63	2.81 3½x1½ 6x1½	9.63	3.87 3½x2 7x1½	11.75	4.12 3½x2 7x2	11.75	4.37 3½x2 7x2½	12.75	5.00 3½x1½ 6x1½	14.00 9x2	6.00 3½x2 7x2	16.00 11x2
2.06 4x1 6x1	8.63	2.56 4x1 6x1½	9.63	3.12 4x1½ 7x1½	10.75	3.62 4x2 8x1½	11.75	3.87 4x2 8x2	12.75	4.75 4x2 8x2½	14.00	5.25 4x1½ 7x1½	15.00 10x2	6.25 4x2 8x2	17.00 12x2
2.30 4½x1 7x1	9.60	2.87 4½x1 7x1½	10.75	2.87 4½x1½ 7x1½	10.75	3.37 4½x1½ 7x2	11.75	4.22 4½x2 8x2	12.75	4.50 4½x2 8x2½	14.00	5.00 4½x1½ 7x1½	15.00 10x2	6.00 4½x2 8x2	17.00 12x2
2.01 5x1 7x1	9.60	2.39 5x1 7x1½	10.75	3.09 5x1½ 8x1½	11.75	3.89 5x1½ 8x2	12.75	4.19 5x2 9x2	14.00	4.72 5x2 9x2½	15.00	5.22 5x1½ 8x1½	16.00 11x2	6.22 5x2 9x2	18.00 14x2
2.06 6x1 8x1	10.75	2.56 6x1 8x1½	11.75	3.06 6x1½ 9x1½	12.75	3.89 6x1½ 9x2	14.00	4.19 6x2 10x2	15.00	4.69 6x2 10x2½	16.00	5.19 6x1½ 9x1½	17.00 12x2	6.19 6x2 10x2	19.00 15x2
2.08 7x1 9x1	11.75	2.58 7x1 9x1½	12.75	3.19 7x1½ 10x1½	14.00	3.69 7x1½ 10x2	15.00	4.19 7x2 11x2	16.00	4.69 7x2 11x2½	17.00	5.19 7x2½ 12x2½	18.00	6.19 7x2 11x2	20.00 16x2
2.00 8x1 10x1	12.75	2.62 8x1 10x1½	14.00	3.19 8x1½ 11x1½	15.00	3.19 8x1½ 11x2	16.00	4.19 8x2 12x2	17.00	4.69 8x2 12x2½	18.00	5.19 8x2½ 14x2½	19.00	6.19 8x2 12x2	21.00 17x2
2.18 9x1 11x1	14.00	2.09 9x1 11x1½	15.00	3.19 9x1½ 12x1½	16.00	3.69 9x1½ 12x2	17.00	4.13 9x2 14x2	18.00	4.69 9x2 14x2½	19.00	5.19 9x2½ 15x2½	20.00	6.19 9x2 14x2	22.00 16x2
2.12 10x1 12x1	15.00	2.62 10x1 12x1½	16.00	3.13 10x1½ 14x1½	17.00	3.69 10x1½ 14x2	18.00	4.13 10x2 15x2	19.00	4.63 10x2 15x2½	20.00	5.13 10x2½ 16x2½	21.00	6.13 10x2 15x2	23.00 19x2
2.12 11x1 14x1	16.00	2.62 11x1 14x1½	17.00	3.13 11x1½ 15x1½	18.00	3.63 11x1½ 15x2	19.00	4.13 11x2 16x2	20.00	4.63 11x2 16x2½	21.00	5.13 11x2½ 17x2½	22.00	6.13 11x2 16x2	24.00 20x2
2.12 12x1 15x1	17.00	2.62 12x1 15x1½	18.00	3.13 12x1½ 16x1½	19.00	3.63 12x1½ 16x2	20.00	4.13 12x2 17x2	21.00	4.63 12x2 17x2½	22.00	5.13 12x2½ 18x2½	23.00	6.13 12x2 17x2	25.00 21x2
2.00 14x1 16x1	18.00	2.50 14x1 16x1½	19.00	3.00 14x1½ 17x1½	20.00	3.50 14x1½ 17x2	21.00	4.00 14x2 18x2	22.00	4.50 14x2 18x2½	23.00	5.00 14x2½ 19x2½	24.00	6.00 14x2 18x2	26.00 22x2
2.00 15x1 17x1	19.00	2.50 15x1 17x1½	20.00	3.00 15x1½ 18x1½	21.00	3.50 15x1½ 18x2	22.00	4.00 15x2 19x2	23.00	4.50 15x2 19x2½	24.00	5.00 15x2½ 20x2½	25.00	6.00 15x2 19x2	27.00 23x2
2.00 16x1 18x1	20.00	2.50 16x1 18x1½	21.00	3.00 16x1½ 19x1½	22.00	3.63 16x1½ 19x2	23.00	4.00 16x2 20x2	24.00	4.50 16x2 20x2½	25.00	5.00 16x2½ 21x2½	26.00	6.00 16x2 20x2	28.00 24x2
2.00 17x1 19x1	21.00	2.50 17x1 19x1½	22.00	3.00 17x1½ 20x1½	23.00	3.50 17x1½ 20x2	24.00	4.00 17x2 21x2	25.00	4.50 17x2 21x2½	26.00	5.00 17x2½ 22x2½	27.00	6.00 17x2 21x2	29.00 25x2
2.00 18x1 20x1	23.00	2.50 18x1 20x1½	23.00	3.00 18x1½ 21x1½	24.00	3.50 18x1½ 21x2	25.00	4.00 18x2 22x2	26.00	4.50 18x2 22x2½	27.00	5.00 18x2½ 23x2½	28.00	6.00 18x2 22x2	30.00 26x2
2.00 19x1 21x1	23.00	2.50 19x1 21x1½	24.00	3.00 19x1½ 22x1½	25.00	3.50 19x1½ 22x2	26.00	4.00 19x2 23x2	27.00	4.50 19x2 23x2½	28.00	5.00 19x2½ 24x2½	29.00	6.00 19x2 23x2	31.00 27x2
2.00 20x1 22x1	24.00	2.50 20x1 22x1½	25.00	3.00 20x1½ 23x1½	26.00	3.50 20x1½ 23x2	27.00	4.00 20x2 24x2	28.00	4.50 20x2 24x2½	29.00	5.00 20x2½ 25x2½	30.00	6.00 20x2 24x2	32.00 28x2
2.00 21x1 23x1	25.00	2.50 21x1 23x1½	26.00	3.00 21x1½ 24x1½	27.00	3.50 21x1½ 24x2	28.00	4.00 21x2 25x2	29.00	4.50 21x2 25x2½	30.00	5.00 21x2½ 26x2½	31.00	6.00 21x2 25x2	33.00 29x2
2.00 22x1 24x1	26.00	2.50 22x1 24x1½	27.00	3.00 22x1½ 25x1½	28.00	3.50 22x1½ 25x2	29.00	4.00 22x2 26x2	30.00	4.50 22x2 26x2½	31.00	5.00 22x2½ 27x2½	32.00	6.00 22x2 26x2	34.00 30x2
		2.50 23x1 25x1½	28.00	3.00 23x1½ 26x1½	29.00	3.50 23x1½ 26x2	30.00	4.00 23x2 27x2	31.00	4.50 23x2 27x2½	32.00	5.00 23x2½ 28x2½	33.00		
		2.50 24x1 26x1½	29.00	3.00 24x1½ 27x1½	30.00	3.50 24x1½ 27x2	31.00	4.00 24x2 28x2	32.00	4.50 24x2 28x2½	33.00	5.00 24x2½ 29x2½	34.00		
				3.00 25x1½ 28x1½	31.00	3.50 25x1½ 28x2	32.00	4.00 25x2 29x2	33.00	4.50 25x2 29x2½	34.00	5.00 25x2½ 30x2½	35.00		
				3.00 26x1½ 29x1½	32.00	3.50 26x1½ 29x2	33.00	4.00 26x2 30x2	34.00	4.50 26x2 30x2½	35.00	5.00 26x2½ 31x2½	36.00		
				3.00 27x1½ 30x1½	33.00	3.50 27x1½ 30x2	34.00	4.00 27x2 31x2	35.00	4.50 27x2 31x2½	36.00	5.00 27x2½ 32x2½	37.00		
				3.00 28x1½ 31x1½	34.00	3.50 28x1½ 31x2	35.00	4.00 28x2 32x2	36.00	4.50 28x2 32x2½	37.00	5.00 28x2½ 33x2½	38.00		
				3.00 29x1½ 32x1½	35.00	3.50 29x1½ 32x2	36.00	4.00 29x2 33x2	37.00	4.50 29x2 33x2½	38.00				
				3.00 30x1½ 33x1½	36.00	3.50 30x1½ 33x2	37.00								

17 001 2244

OWENS-CORNING FIBERGLAS CORP.

OWENS-CORNING FIBERGLAS

specifications

sectional pipe insulation

for hot and cold lines 450 F to minus 120 F

heated lines to 450 F
applicable specifications

HH-I-552 Insulation Pipe Covering, Thermal, and Insulator Blanket, Thermal, Pipe Covering Type I, Class A and B

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

ASTM 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 adhered canvas, when furnished, smoothly over joints. Longitudinal and circumferential joints need not be pointed with finishing cement.

Insulation on pipes over 12" diameter shall be wired or banded in place on no greater than 12" 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 not subject to abrasion or mechanical abuse, requires no additional finish other than the factory furnished canvas. Band may be used if specified.

Piping located outdoors shall be finished with approved weather resistant corrugated aluminum jacketing with all lon-

chilled water and dual-temp piping 35 F to 200 F
applicable specification

HH-I-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 pipe insulation shall be sealed off with fire-resistant mastic (such as Foster 60-30 N or equal) at all flanges, valves and fittings and at intervals of not more than 21 feet on continuous runs of pipe.

All flanges, valves and fittings shall be insulated with molded or fabricated insulation of a thickness equal to that of the insulation of 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 upward along the vertical hanger rod to a point not less than 6" or 4 times the pipe insulation thickness and sealed off.

ice water and special process 34 F. to minus 120 F.
applicable specification

HH-I-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 FRJ 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 room temperature. For complete application, rust proofing is necessary. Adjoining sections shall be butted firmly together and the longitudinal seam of the vapor barrier jacket shall be sealed with Foster 60-30 N adhesive, or equal. Staples are not recommended for holding the laps shut. End joints shall be sealed with 4-inch factory-furnished vapor barrier strips applied with Foster 60-30 N, or equal. In multiple layer construction all joints shall be staggered.

Ends of pipe insulation shall be sealed off with Foster 60-30 N, or equal and at intervals of not more than 21 feet on continuous runs of pipe.

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 upward along the vertical hanger rod to a point not less than 4 times the pipe insulation thickness from the adjacent pipe finish and sealed off. Insulation on hangers shall be a minimum of 1½ pipe insulation thickness.

3. Surface Finish—Piping located indoors needs no further painting. If painting is specified, a fire-resistive heavy-bodied PVA coating (color as selected) shall be used.

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

gitudinal joints lapped not less than 3" and banded 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 60-89-05.

All insulation on flanges, valves and fittings located outdoors shall be covered with Foster HI Mastic or equal, reinforced with an open mesh glass fabric. Mastic shall be applied in two coats of sufficient thickness to give a ⅛" dry film and shall be troweled neatly over the fitting and lapped over the jacket on the adjacent pipe.

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3. 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 Foster's Sealfas 30-36 or equal, weatherproof aluminum paint or a trowel coat of asphalt mastic reinforced with glass fabric.

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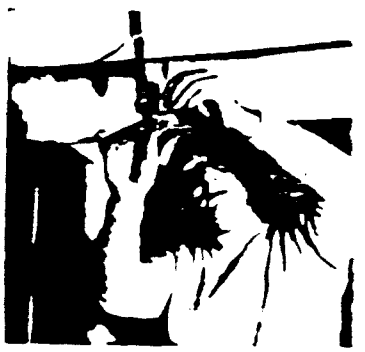
shed water. The cover shall be held in place by soft aluminum bands on 12" centers or loops of 16-gauge galvanized soft annealed wire spaced no more than 8-inch centers. Nothing shall be allowed to pierce jacket at any point.

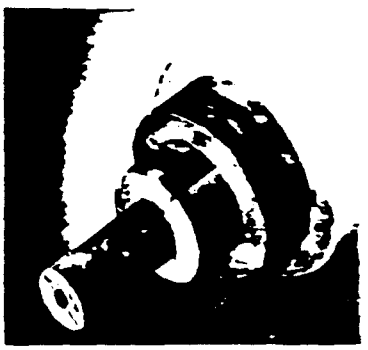
Insulation on flanges, valves and fittings shall be vapor sealed with 0.002" aluminum foil wrapped or crinkled in place lapping adjoining jacket at least one inch. Foil shall be finished with an ⅛ inch layer of a vapor seal adhesive troweled neatly over the fitting with the jacket on the adjacent pipe insulation lapped at least 2" over the mastic. Outdoor finish of these elements shall include a second ⅛ inch thick coat of a suitable weather-resistant mastic, such as Foster 60-30 N, reinforced with a tight exterior wrapping of open mesh glass fabric troweled well into mastic.

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



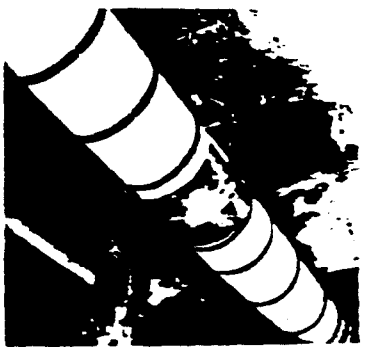
Bands are supplied for placing over edges of the end joint sealer strips or the center of each section for holding until the adhesive sets.

Fittings are insulated with mitered segments of insulation and vapor sealed with foil and a brush coat of vapor barrier sealer, reinforced with 8-oz. canvas and finished with a second coat of sealer. Pre-molded fitting insulation may also be used.



Multiple layer applications and stagg joint construction are recommended to b up thicknesses on low temperature lines. pages 8 and 9 for nesting sizes.) final layer vapor jacket flaps must be fully sealed with vapor barrier adhesive outdoor applications additional weatherpr ing is required.

A foil barrier on fittings assures a continuous unbroken vapor barrier. The .002" aluminum foil is crinkled into place and subsequently covered with vapor barrier mastic and glass fabric reinforcement. Insulation at all fittings and hangers require sealing off to the pipe and straight runs every 21 feet.



At the saddle or trapeze hangers a m shield is required to support the insul piping. Shield is to be 12 ga. and t times the diameter of the pipe, in len with a minimum of 12".

17 001 2246

FIBERGLAS

pipe insulation

sectional heavy density low pressure

for cold water, hot water and low pressure steam lines in the temperature range of 50 F to 250 F

Fiberglas Low Pressure Pipe Insulation is molded, ½ inch thick and designed for use on cold water, hot water or low pressure steam lines. Fibers knit together at joints when insulation is applied to give a continuous covering of efficient insulation. High efficency permits the use of ½" thick covering instead of ¾" to 1" thick products of less efficient materials.

The "k" of Low Pressure Pipe Insulation averages 0.24 Btu/(hr) (sq ft) (F/in.) at 75 F mean temperature. A new, white universal jacket makes it the first all-purpose low pressure pipe insulation in the industry. It is creped to produce a pleasing appearance for all low pressure applications without additional finishing.

sizes

iron pipe—¼" to 12" in diameter
copper tubing—½" to 4⅛" outside diameter
insulation thickness—½"nominal
section length—3 ft.

jackets

universal—Heavy, white kraft paper is laminated to an interior 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 and must not be used outside of this temperature range nor on thicknesses of insulation greater than ¾". The aluminum foil provides necessary protection against condensation on cold piping if the joints are vapor sealed. If desired, it may be finished with any water-base paint. A variety of easy application methods eliminates the use of metal bands.

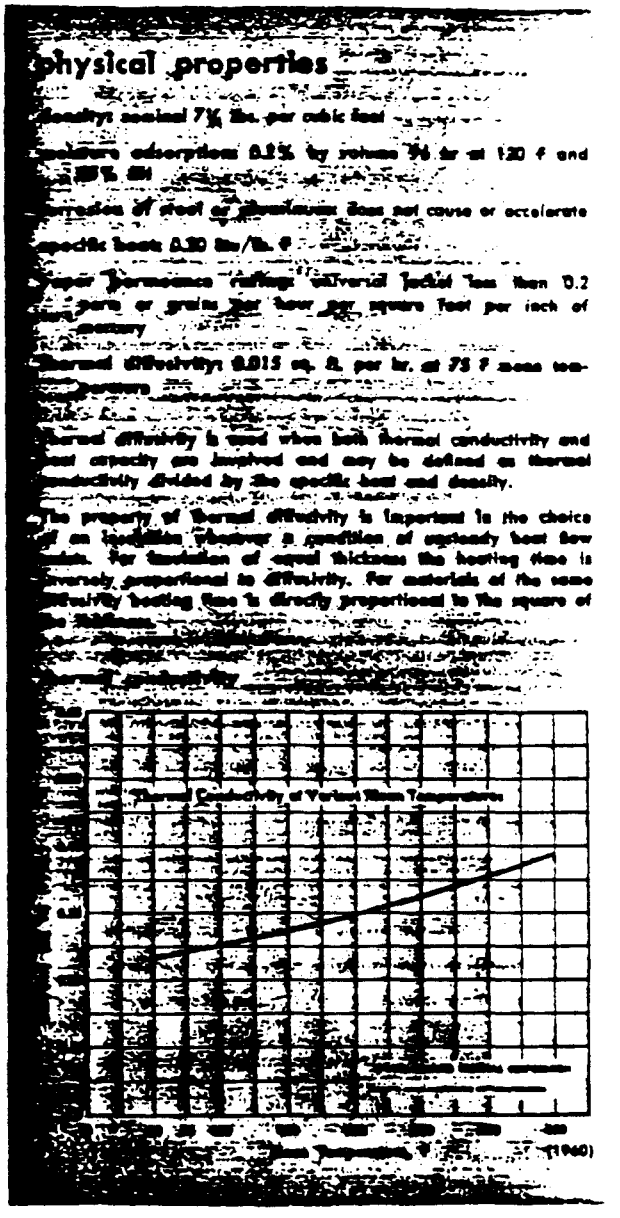
canvas—The standard weight canvas jacket suits Low Pressure Pipe Insulation for use on hot water or low steam pressure lines only. A heavier canvas jacket, 6 or 8 oz., is availabe on request at a slight additional cost. End overlaps aid convenient application.

FRJ (Flame Retardant Jacket)—Where flame retardance indoors is desired, FRJ which is reinforced with glass yarn for high puncture resistance and with aluminum foil for excellent vapor resistance is available at a slight extra charge. For hot indoor lines, jacket may be stapled or banded.

limitations

Fiberglas Low Pressure Pipe Insulation is designed for use at temperatures from 50 F to 250 F. The thickness of this product does not permit its use for lower temperatures such as on mechanically chilled lines or when operating temperatures exceed 250 F.

physical properties



design data

The table on page 13 has been developed to indicate the thermal performance characteristics of the available sizes of Fiberglas Low Pressure Pipe Insulation. It is designed to give heat loss, efficiency and surface temperature values for hot line applications of Fiberglas Low Pressure Pipe Insulation. For cold lines, heat gain and surface temperature figures are shown.

17 001 22

pipe insulations

from 50 to 250 F

thermal performance

pipe temp.	hot lines (80 F ambient) 150 F			200 F			250 F			cold lines (90 F ambient) 50 F	
properties	HL*	E*	ST*	HL	E	ST	HL	E	ST	HG*	ST
½	10	70.4	94	18	74.2	104	26	76.4	114	5.3	83
¾	11.5	74.0	97	20.5	76.2	106	30.5	77.3	116	6.0	82
1	13.5	75.0	96	23.6	77.8	106	35	78.9	114	7.2	83
1¼	16	76.2	96	29	77.7	106	43	79.1	116	8.5	82
1½	18.6	75.5	95	34	76.8	105	50.5	78.3	116	10.0	82
2	20.5	77.9	96	37	79.4	118	60.5	78.8	121	10.7	82
2½	25	77.3	96	45	79.0	107	67	80.5	118	13.0	81
3	32	75.9	98	56	78.3	117	80	79.7	119	16.3	81
3½	31	79.3	98	60	79.4	112	91	80.2	125	18.7	80
4	35	79.0	98	63	80.7	107	96	81.7	117	19.1	80
5	38	81.4	94	69	82.6	103	103	83.5	113	20.1	81
6	46	80.8	97	83	82.2	107	122	82.5	116	22.0	81
8	62	80.0	97	118	81.2	108	183	82.3	120	29.0	80
10	78	79.2	97	145	80.2	110	217	81.2	123	44.0	80
12	92	79.2	97	170	80.2	111	254	81.3	124	50.0	80
½	7.0	79.2	85.5	12.9	81.3	101.4	19.6	82.4	110.1	4.0	83
¾	8.2	76.2	93.1	14.7	80.0	102.2	21.8	81.0	111.6	4.3	83
1	9.3	78.7	92.6	16.7	80.2	101.7	24.2	81.7	112.8	4.8	83
1¼	10.2	76.7	94.7	18.1	78.5	103.9	27.2	79.7	113.3	5.3	83
1½	11.9	77.2	94.6	21.4	79.3	104.8	32.1	80.5	114.7	6.2	82
2	13.9	79.1	94.9	25.1	80.6	104.9	37.2	81.8	115.3	7.1	82
2½	15.8	78.8	95.1	28.2	81.8	105.3	42.1	81.8	116.0	8.0	83
3	19.6	79.8	96.6	36.3	79.8	107.5	53.5	81.1	119.2	10.8	81
3½	22.6	79.0	95.7	41.1	80.8	106.4	61.0	82.0	117.7	11.8	81
4	26.7	79.7	96.3	48.1	80.9	107.5	71.7	82.3	119.2	13.9	81
5	30.3	79.3	97.2	56.3	79.2	109.6	82.3	81.7	121.7	15.9	81
6	33.8	79.8	96.4	63.7	77.4	112.8	93.4	82.1	124.3	17.7	81

*HL: Heat Loss—Btu/hr./lin. ft. E: Efficiency—% of heat loss stopped by insulation
ST: Surface Temperature of Insulation °F. HG: Heat Gain—Btu/hr./lin. ft.

specifications

applicable specification

HH-I-552 Insulation, Pipe Covering Thermal, and Insulation Blanket, Thermal, Pipe Covering Type I, Class A

1. Insulating materials

All cold water, hot water and low pressure steam lines shall be insulated with Fiberglas Low Pressure Pipe Insulation as manufactured by Owens-Corning Fiberglas Corp.

2. Application

On cold line applications the universal jacket shall be adhered at longitudinal laps and joint seal strips with a white vapor barrier adhesive, such as Foster 81-91, that will match the universal jacket in color. Where FRJ is used adhere with Foster 81-99 or equal.

On hot line applications, the universal jacket and 4" sealing strips shall be banded, cemented or stapled. (Staples to be similar to Flare-door type Bostitch staples and shall be applied 3 to 4 inches on centers.)

3. Fittings

Fittings shall be insulated with O-C 110 Insulating Cement or molded fibrous glass fitting covers.

Cold water fittings shall be additionally vapor-sealed with Foster 30–36 and canvas.

Finish on hot water fittings shall consist of adhering and sizing standard-weight canvas with Lagfas. If a more finished appearance is desired, use Lagtone.

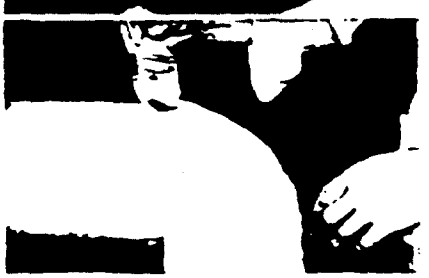
The foregoing is necessarily general in nature. Application procedure and material approval is at the discretion and responsibility of the design engineer to meet specific job requirements.

application details

for cold lines—universal jacket

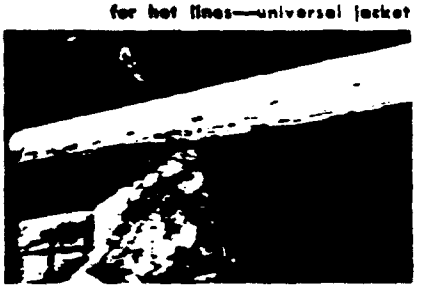
Coat the 2½" lap of the white universal jacket with a white vapor barrier lap adhesive and place the insulation around the pipe.

Smooth the lap to seal the joint. Seal joints between sections with a factory-supplied 4" wide sealing strip.



Insulate fittings with O-C 110 Insulating Cement that will be off-white when dry. Vapor seal with a white vapor barrier lap cement and canvas.

for hot lines—universal jacket



Staple, band or cement the white universal jacket. If stapled, the staples shall be applied 3 to 4 inches on center. Insulate fittings with a hydraulic-setting cement that will be off-white when dry. Staples should be used on hot lines only, unless well vapor sealed.

canvas jacket

Secure with adhesive and butt joints tightly together for heat-tight efficiency. Aluminum bands available with the insulation. Insulate fittings and finish with standard weight canvas adhered in place.

OWENS-CORNING FIBERGLAS

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 almost all large and small piping and copper tubing sizes.

description

Fiberglas* One-Piece Pipe Insulation is a resilient, lightweight pipe insulation molded from fine glass fibers. It is made 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 the use of lesser thicknesses than other pipe coverings to affect greater heat-saving economies. Fiberglas One-Piece Pipe Insulation is not affected by moisture, will not corrode metals, will not shrink, and will accommodate line expansion and contraction without cracking.

jackets

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

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

Universal—A heavy, white kraft paper is laminated to an interior 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, and must not be used outside of this temperature range nor on thicknesses of insulation greater than ¾".

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

Dual 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.

*T. M. Owens-Corning Fiberglas Corp.

physical properties

density: 4 lbs. per cu. ft. (approx.)

moisture absorption: 0.2% by volume 96 hrs. at 120 F and 95% RH

specific heat: 0.20 Btu/lb. F

shrinkage: None

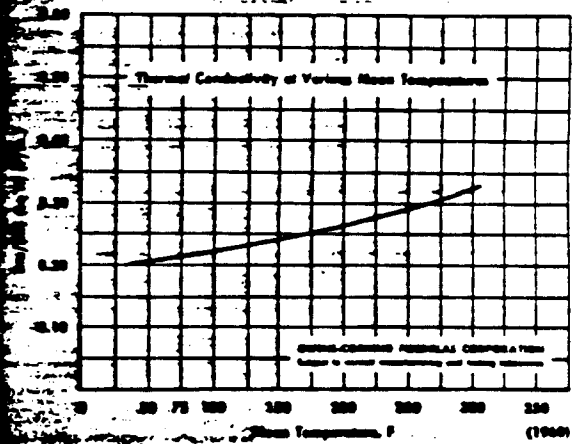
alkalinity: ph 9

thermal diffusivity:

.024 sq. ft. per hr. at 75 F mean temperature. It may be defined as thermal conductivity divided by the specific heat and density. Wherever a condition of unsteady heat flow exists, the property of thermal diffusivity is important in the choice of a pipe insulation. With insulations of equal thickness, heating time is inversely proportional to the diffusivity; with materials of the same diffusivity, heating time is directly proportional to the square of the thickness.

thermal conductivity

Fiberglas insulation's unusually low thermal conductivity (k) values (shown on the chart below) make this the ideal one-piece pipe insulation for all applications in its temperature range.



advantages

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

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.

specifications

applicable specifications

a. Hot Water, Cold Water and Low Pressure Steam Lines: 50 to 250 F

HH-I-552 Insulation Pipe Covering, Thermal, and Insulation Blanket, Thermal, Pipe Covering Type I, Class A and B

b. Heated Lines: up to 400 F

HH-I-562 Insulation, Thermal, Mineral Wool, Block or Board and Pipe Insulation (Molded Type) Type II, Classes 2 and 3 ASTM Specification 281-51T

c. Cold and Dual Temperature Piping: 35 to 200 F

HH-I-562

d. Low Temperature Lines: 34 to −30 F

recommended thicknesses

IP — iron pipe
CT — copper tubing

ET—recommended thickness
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 10.*)

b. Heated Lines: up to 400 F (*See page 10.*)

c. Cold and Dual Temperature Piping: 35 to 200 F. (*See page 10.*)

d. Low Temperature Lines: 34 to −30 F (*See page 10.*)

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.

cold water, hot water and 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	
temp. diff.	70 F		120 F		170 F		40 F		120 F		170 F		220 F		270 F		320 F	
pipe size	ET	HL	ET	HL	ET	HL	ET	HG	ET	HL	ET	HL	ET	HL	ET	HL	ET	HL
½	½	8	½	14	½	21	½	4	½	14	1	18	1	25	1½	27	2	29
¾	½	10	½	18	½	27	½	5	½	17	1	22	1	30	1½	31	2	34
1	½	13	½	24	½	36	½	6	½	23	1	23	1	31	1½	34	2	37
1¼	½	14	½	25	½	38	½	7	½	25	1	29	1½	29	1½	37	2	43
1½	½	18	½	32	½	48	½	8	¾	24	1	30	1½	32	1½	42	2	48
2	½	19	½	34	½	53	½	10	¾	28	1	35	1½	38	1½	49	2	51
2½	½	23	½	41	½	62	½	12	¾	32	1	40	1½	47	2	50	2½	62
3	½	29	½	52	½	79	½	15	¾	40	1	47	1½	50	2	54	2½	59
3½	½	33	½	59	½	89	½	17	¾	43	1	45	1½	61	2	64	2½	60
4	½	35	½	63	½	95	½	18	¾	39	1	57	1½	60	2	64	2½	67
4½	½	28	½	52	½	78	½	15	¾	52	1	54	1½	74	2	76	2½	69
5	½	43	½	77	½	117	½	28	¾	58	1	70	1½	72	2	76	2½	79
6	½	53	½	97	½	143	½	32	¾	60	1½	61	1½	85	2	86	2½	88
7	½	61	½	109	½	164	½	35	1	64	1½	67	1½	92	2	97	2½	101
8	½	67	½	120	½	181	½	38	1	69	1½	75	1½	102	2	106	2½	107
9	½	73	½	132	½	197	½	44	1	76	1½	82	1½	112	2	111	2½	117
10	½	88	½	158	½	237	½	46	1	88	1½	89	1½	121	2	126		
11	½	86	½	157	½	275	½	48	1	87	1½	96	1½	131	2	136		
†12	½	85	½	164	½	251			1	96	1½	105	1½	143				
Tube O.D.																		
⅞	½	8	½	14	½	22	½	86										
1⅛	½	10	½	19	½	28	½	85										
1⅜	½	14	½	25	½	37	½	83										
1⅝	½	14	½	26	½	38	½	84										
2⅛	½	16	½	29	½	43	½	84										
2⅝	½	19	½	34	½	50	½	84										
3⅛	½	21	½	39	½	58	½	84										
3⅝	½	24	½	44	½	66	½	84										
4⅛	½	28	½	49	½	99	½	84										
5⅛	½	31	½	56	½	84	½	84										
6⅛	½	37	½	66	½	99	½	84										

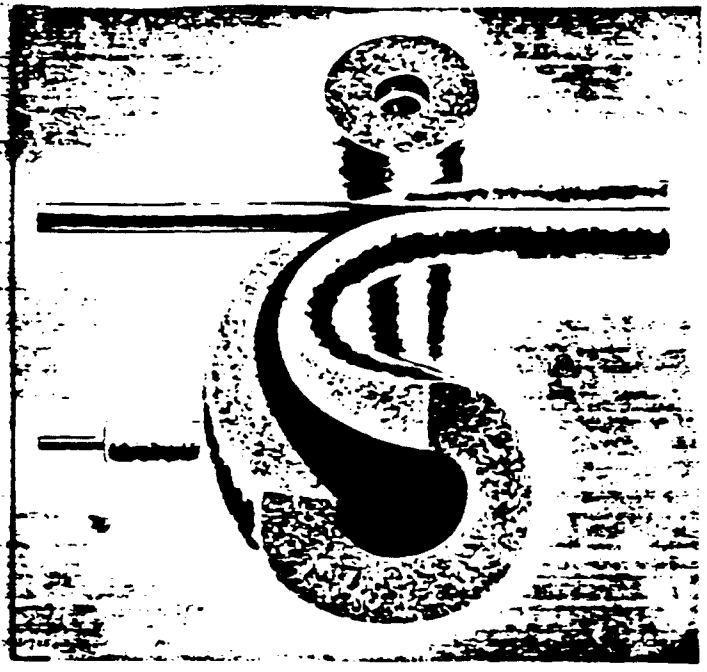
*cold line
†Contact your nearest Fiberglas Branch Office for heat loss values above 12" pipe size.

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	
pipe size	ET	HG	ET	HG	ET	HG	ET	HG
½	½	4	¾	5	1	8	1½	8
¾	½	5	¾	6	1	9	1½	10
1	½	6	¾	7	1½	8	1½	11
1¼	½	7	¾	8	1½	9	1½	12
1½	½	8	¾	9	1½	10	1½	13
2	½	10	¾	11	1½	12	1½	15
2½	½	12	¾	13	1½	15	2	15
3	¾	11	¾	15	1½	16	2	17
3½	¾	12	1	12	1½	18	2	19
4	¾	13	1	14	1½	18	2	20
4½	¾	14	1	15	1½	22	2	23
5	¾	15	1	19	1½	23	2	23
6	¾	17	1	22	1½	25	2	26
7	1	18	1	25	1½	28	2	29
8	1	20	1	27	1½	31	2	32
9	1	22	1	29	1½	34	2	35
10	1	25	1	32	1½	36	2	38
11	1	25	1	34	1½	39	2	41
12	1	26	1	35	1½	43	2	44

OWENS CORNING
FIBERGLAS

O-C flexible tubing insulation



for dual temperature, chilled ice water or refrigerant lines from 0 F to 220 F

physical properties

thermal conductivity: Btu/(hr.) (sq. ft.) (F/in.)
k at 75 F mean 0.25
k at 120 F mean 0.29
water vapor transmission: less than 0.1 Perm (Grains-in./sq. ft.-hr.-in.-Hg.)
air transmission-static pressure at 10" Hg. Less than 0.03 cu. ft.-in./hr.-sq. ft.
water absorption 90 days immersion—less than 5%
density: 2 pcf
fire ratings: self-extinguishing

O-C Flexible Tubing Insulation is a foamed plastic insulation for iron pipe and copper tubing cooling and heating lines, chilled water, and refrigerant lines. It is black, odorless, self-extinguishing, and exceptionally clean to handle. Its flexibility speeds application. The material has a closed cellular structure and is a vapor barrier in itself, so no vapor barrier coating is required. It is available in complete tubes for slipping over tubing or slit.

Because of high insulating efficiency and vapor resistance, O-C Flexible Tubing Insulation's engineered wall thickness will prevent condensation under customary design conditions. On the heating cycle, O-C Flexible Tubing Insulation will withstand temperatures as high as 220 F. Outdoor lines require weather protection applied over the insulation.

O-C Rigid Tubing is a companion product which, except for its rigid form, has all the same characteristics as O-C Flexible Tubing. O-C Rigid Tubing is designed for load bearing use at pipe hangers, as underground insulaton and for use wherever the pipe line is subject to physical abuse such as ladder loads. It is available in matched half sections.

This product is also made in sheet form, O-C Flexible Sheet Insulation, for insulation of equipment, flat surfaces, and pipes operating at temperatures up to 200 F, that are too large for molded covering.

sizes

iron pipe size (IPS)—¼" to 4"

copper tubing (CT)—⅜" OD—4⅛" OD

insulation thickness—½", ½" and ¾" for all pipes and copper tubing through 2" IPS, and in addition ½" and ¾" wall thicknesses for pipes and tubing from 2" through 4" IPS. Sheet form (for larger piping and flat surfaces) from ½" to ¾" in ½" increments.

section length—6' tubing; 30" x 36" sheet.

limitations

temperature limit—Recommended for piping from 0 F to 220 F. Sheet form, 200 F.

outdoor lines—A protective finish is required as outlined in specifications on page 17.

advantages

flexible

O-C Flexible Tubing Insulation is designed for exceptional ease of handling. It is so flexible it can be tied in knots—so resilient it springs back to its original shape when untied. Fast application to both pipe and fittings means that total installed cost of this superior quality insulation usually runs no higher than for conventional type materials—frequently less.

conforms readily

O-C Flexible Tubing Insulation conforms to gradual bends because it is flexible. It easily slips over pipe or tubing before connections are made or can be slit with a knife and snapped in place over lines already connected. Fittings are also easy to cover. O-C Flexible Tubing Insulation can be slipped right over wrought copper fittings. Cast bronze fittings or fittings on iron pipe can be "sleeved" with a larger diameter of insulation nested over the covering on the pipe. This makes a faster, easier and neater job on fittings than wrap-on type insulations or insulating cements.

vaporproof application

O-C Flexible Tubing Insulation, being vaporproof, also saves the extra step of applying a vapor barrier finish on cold lines. Cut seams, mitered joints and end joints are joined with vapor resistant O-C 500 Adhesive. No other sundry material is needed for indoor lines.

O-C Flexible Sheet Insulation is adhered with complete coverage of the surface to be insulated with O-C 500 Adhesive. Apply a thin coat of adhesive to the surface to be insulated and also the sheet insulation. Allow the adhesive to dry before the insulation is applied.

recommended thicknesses
(for condensation prevention only)

	DESIGN CONDITIONS†	PIPE SIZE	O-C Flexible Tubing and Sheet Insulation Thickness for Line Temperatures		
			50 F	32 F	0 F
MILD	(Prevention of condensation on indoor piping under a maximum severity of 80 F and 50% R.H. Typical of those conditions most air-conditioned spaces and arid climates).	⅜" ID thru 2" IPS	Nom. ⅜"	Nom. ⅜"	Nom. ½"
		Over 2" IPS thru 4" IPS	Nom. ½"	Nom. ½"	Nom. ½"
		Over 4" IPS thru 6" IPS	⅜" Sheet	⅜" Sheet	½" Sheet
		Over 6" IPS thru FLAT Surface	⅜" Sheet	⅜" Sheet	½" Sheet
NORMAL	(Prevention of condensation on indoor piping under a maximum severity of 85 F and 70% R.H. Research and field experience suggest indoor conditions anywhere in the U.S. seldom exceed this degree of severity.)	⅜" ID thru 2" IPS	Nom. ⅜"	Nom. ½"	Nom. ¾"
		Over 2" IPS thru 4" IPS	Nom. ½"	Nom. ½"	Nom. ¾"
		Over 4" IPS thru 6" IPS	⅜" Sheet	½" Sheet	1" Sheet*
		Over 6" IPS thru FLAT Surface	⅜" Sheet	¾" Sheet	1" Sheet*
SEVERE	(Prevention of condensation on indoor piping under a maximum severity of 90 F and 80% R.H. Typical of those conditions: indoor areas where excessive moisture is introduced, or poorly ventilated confined areas where the temperature may be depressed below ambient.)	⅜" ID thru 4" IPS	Nom. ¾"	Nom. ¾"	Available on request
		Over 4" IPS thru 6" IPS	¾" Sheet	1" Sheet*	
		Over 6" IPS thru FLAT Surface	1" Sheet	1½" Sheet*	

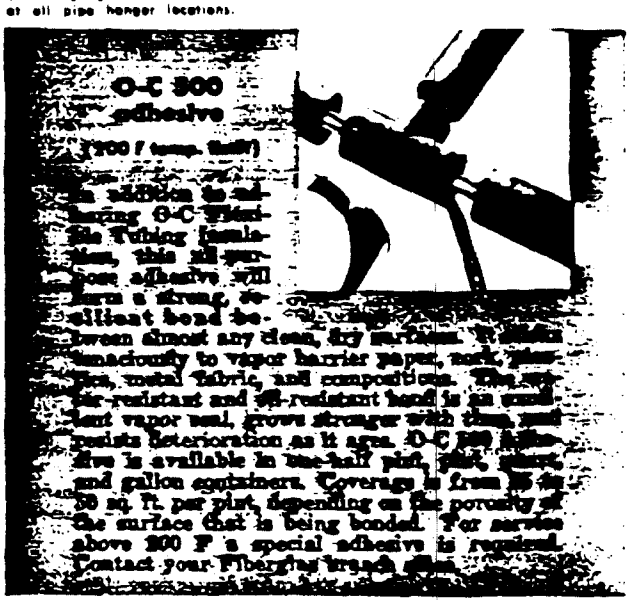
*Sheet thicknesses over ¾" may be obtained with multiple-layer application.
†Consideration for condensation only. Heat gain of coolant not considered because O-C Flexible Tubing Insulation is used primarily on short run-outs.

design data
The table above has been developed to indicate the recommended thicknesses of O-C Flexible Tubing Insulation for several different design conditions. Thicknesses shown are for prevention of condensation only and heat gain or loss has not been considered since O-C Flexible Tubing Insulation is used primarily on short run-outs.

Table of OC Rigid Tubing Pipe Supports

Pipe Size		Rigid Tubing Size	Recommended Support Length Inches (min.)*†	Recommended Pipe Hanger Spacing Feet (max.)*
Copper	Iron			
⅜" OD	—	⅜" ID	3	7
½" OD	¼" IPS	½" ID	4	7
⅝" OD	⅜" IPS	⅝" ID	4	7
¾" OD	—	¾" ID	4	7
⅞" OD	½" IPS	⅞" ID	4	7
1⅛" OD	¾" IPS	1⅛" ID	6	8
1⅜" OD	1" IPS	1⅜" ID	8	9
1⅝" OD	1¼" IPS	1⅝" ID	8	9
—	1½" IPS	1½" IPS	10	10
2⅛" OD	—	2⅛" ID	8	10
—	2" IPS	2" IPS	12	11
2⅝" OD	—	2⅝" ID	12	12
—	2½" IPS	2½" IPS	18	13
3⅛" OD	—	3⅛" ID	18	14
—	3" IPS	3" IPS	18	14

*Where combination copper tube and iron pipe exist support length and pipe hanger spacing are based upon iron pipe, the most severe condition.
†An 18 gauge metal shield, the same length as the Rigid Tubing, is to be used at all pipe hanger locations.



specifications

1. Insulating material
All cold or dual temperature pipe and tubing lines as noted on drawings shall be insulated with O-C Flexible (Rigid) Tubing Insulation, a foamed plastic insulation. The thickness shall be determined from manufacturer's thickness tables for the design conditions specified.

2. Application
O-C Flexible Tubing Insulation and/or O-C Rigid Tubing Insulation shall be applied over clean dry surfaces with pipe at approximately room temperature.
Pipe or tubing may be insulated with O-C Flexible Tubing before connection by slipping the molded insulation over the lines. Lines already connected shall be insulated by slitting the flexible tubular insulation sections and applying them around piping or tubing.
O-C Rigid Tubing shall be applied at hanger locations as the bottom supporting half section matched with a top half section of flexible or rigid tubing. In all cases longitudinal joints are to be in a horizontal plane. (Required lengths of O-C Rigid Tubing by pipe size are shown in table at left.) An 18 gauge metal shield the same length as the O-C Rigid Tubing is to be used at all pipe hanger locations.
All butt ends and longitudinal joints shall be sealed with O-C 500 adhesive.
Piping over 4" IPS, curved and flat surfaces shall be insulated with flat sheets securely adhered with O-C 500 adhesive.
All fittings shall be fabricated from O-C Flexible or Rigid Tubing Insulation in nesting sizes. Join slit and mitered joints with O-C 500 adhesive.
For use underground, apply O-C Rigid Tubing in prematched half sections. No separately supported load bearing material is required.

3. Surface finish
Piping located indoors in concealed spaces requires no surface finish treatment. Exposed piping shall be painted with one coat of No. 1 asphalt paint or two coats of asphalt based aluminum paint.

Outdoor piping shall be protected from the weather by (choose one) (a) applying 45 lb. asphalt-saturated and coated roofing felt wired firmly in place with copper clad wire on 6" centers; (b) apply two coats of weatherproof plastic reinforced with glass mesh membrane.
Where O-C Rigid Tubing is installed underground, no finish is required.

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.

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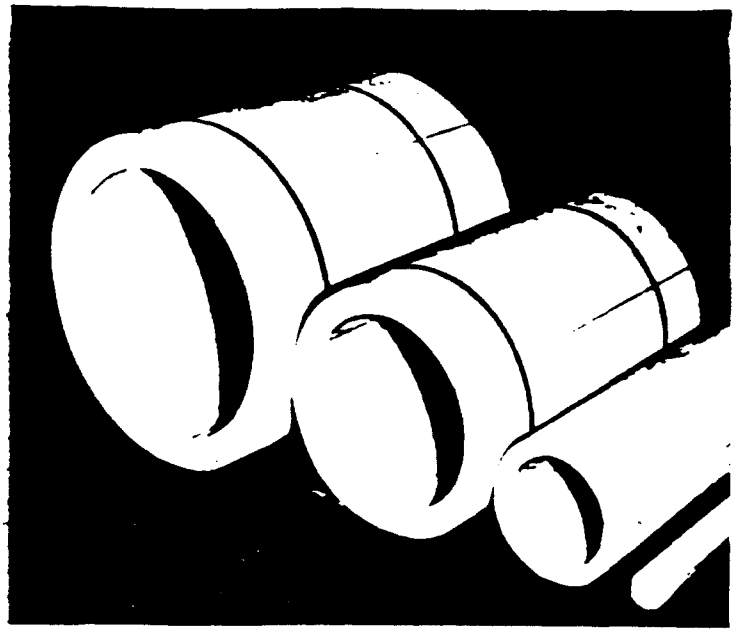
KAYLO pipe insulation

note:
high temperature 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.

(for temperatures ranging from 1200 F to 1800 F, see Kaylo-20, page 22)

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.

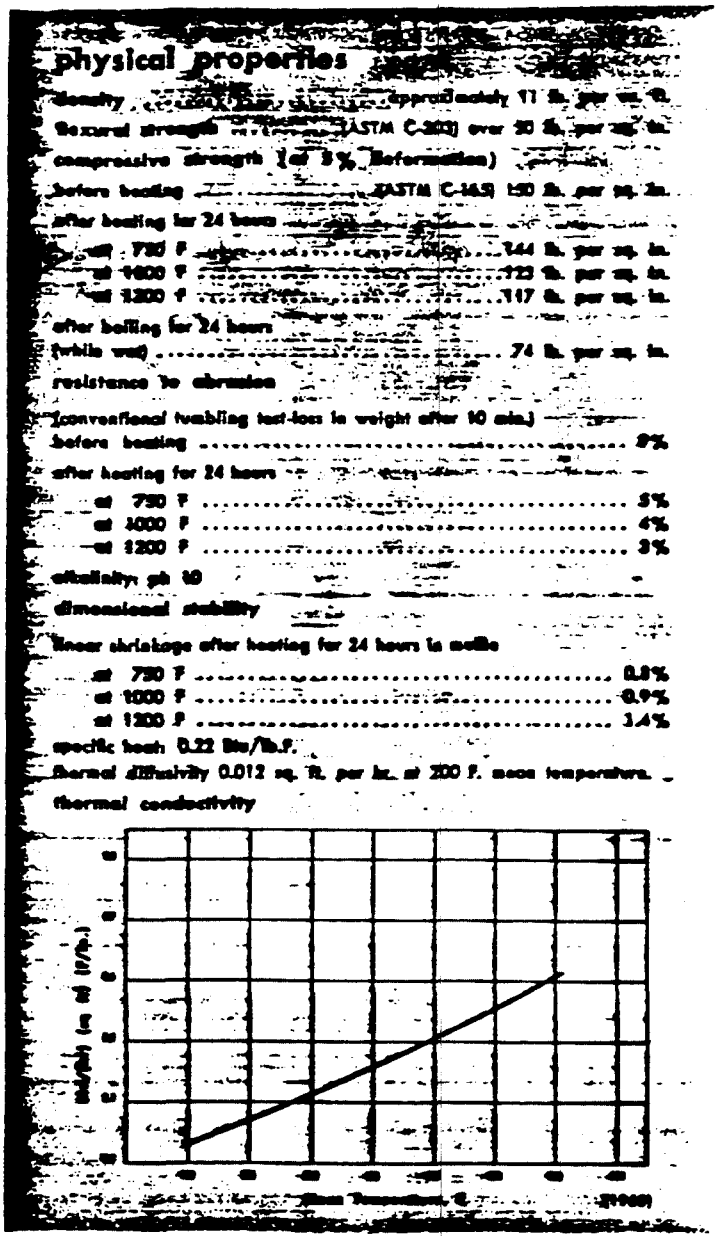
6 oz. and 8 oz. canvas jackets are available for all types, sizes and thicknesses of Kaylo Pipe and Tube Insulation at an additional charge. These jackets are factory applied on Sectional Pipe and Tube Insulation. On Multisegmental forms, they are furnished but not adhered.

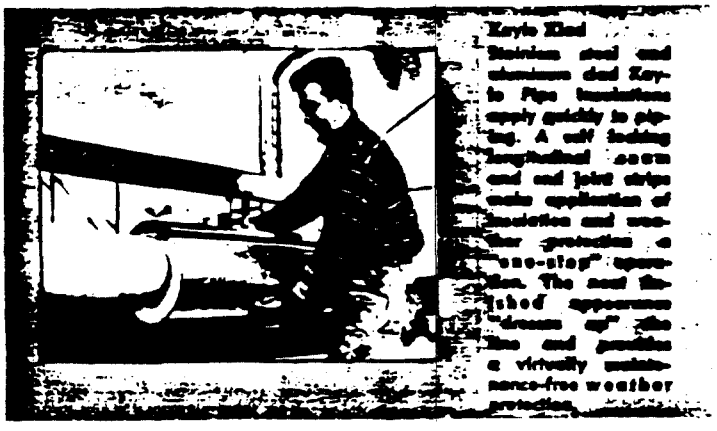
Kaylo Kled—Kaylo is also available with a soft rippled embossed aluminum jacket .016" thick or .010 stainless steel jacket. These jackets provide greater resistance to mechanical damage and present a neat finished appearance to pipe lines. The longitudinal seam has a self-locking joint. Joint bands with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

*T. M. Owens-Corning Fiberglas Corp.





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 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 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.

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.

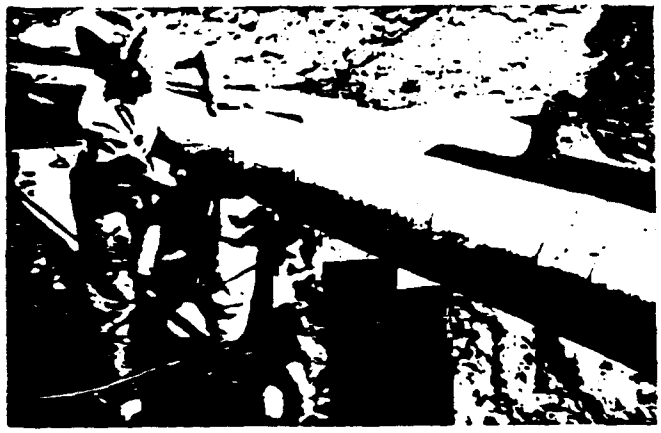
Importance of calculating economic thickness

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

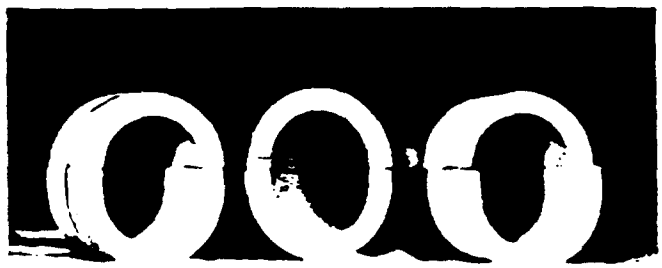
1. Cost of insulation applied
2. Cost of heat energy
3. Cost of capital
4. Depreciation period—plant and insulation
5. Capital investment in heat production equipment
6. Temperature differential
7. Size of the pipe or surface
8. Conductivity of insulation

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



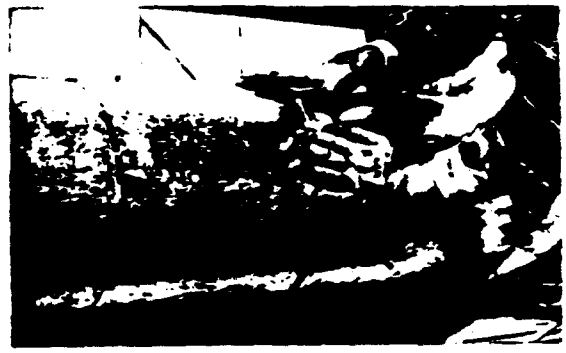
▲ Off-site yard steam insulated with Kaylo Pipe Insulation for efficiency and controlled temperatures at distant points.



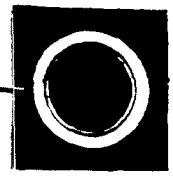
▲ New Kaylo Trace Line pipe insulation and Kaylo Klad Trace Line Pipe Insulation (jacketed with .016 embossed aluminum or .010 stainless steel) provide great economy in the insulation of trace lines.

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, 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				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	106	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	97.3	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	96.6	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	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	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	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	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	182.1	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	97.3	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	96.6	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	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	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	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	93.2	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	128	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	96.9	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
½	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
¾	1	34.2	79.5	104	1	75.2	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	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
1¼	1	45.8	82.0	108	1	102	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	102	87.8	129	1½	135	92.4	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	88.6	131	1½	154	93.0	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	158	94.0	127	2	200	96.4	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	93.7	140	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	92.7	147	2	293	96.1	148	3	299	97.6	137	3½	335	97.9	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	386	98.0	145
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	430	98.2	147
7	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
8	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
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	144	3½	504	98.3	140	4	563	98.5	144
12	1½	153	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
14	1½	178	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
16	1½	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
18	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
20	1½	246	90.5	108	1½	541	93.1	134	2½	588	96.5	135	3	735	97.7	144	4	777	98.6	142	5	840	98.9	143
24	1½	291	90.5	108	1½	642	93.1	135	2½	690	97.0	136	3	870	97.7	147	4	903	98.6	144	5	922	98.9	143

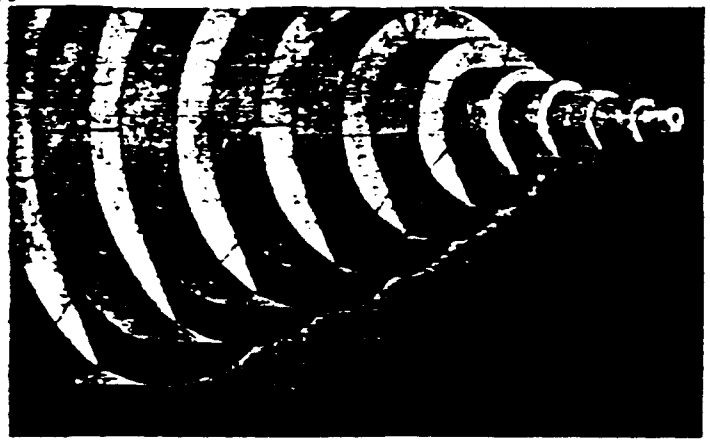
*Surface temperatures for Kaylo-Clad will be higher due to the emissivity of the aluminum jacket. This will vary with ambient temperature thickness of insulation used. However, the thermal efficiency of the application will be improved slightly by aluminum jacket.

OWENS-CORNING FIBERGLAS CORP.

FIBERGLAS

KAYLO-20 pipe insulation

high temperature insulation and fireproofing 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 temperatures up to 1800 F. It should not be used when operating temperatures 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%

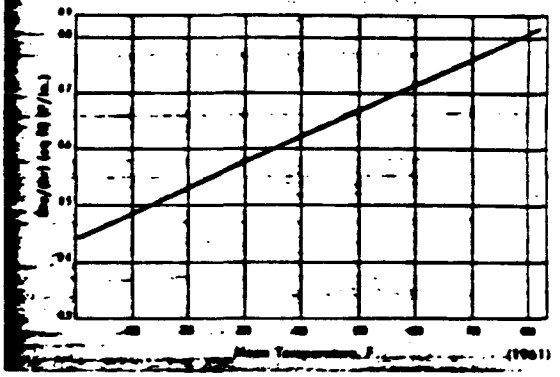
resistance to abrasion:
(conventional tumbling test—loss in weight after 10 min.)
before heating 3%
after heating for 24 hours
at 1200 F 5%
at 1800 F 20%

alkalinity: ph 10

working temperatures: 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



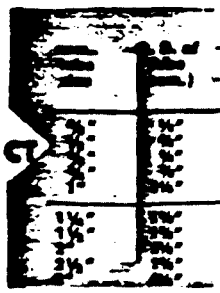
recommended thicknesses†

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.

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
5	4	4	4½	4½	5	5½	6	6½
6	4	4	4½	4½	5	5½	6	6½
8	4	4½	4½	5	5½	6	7	7
10	4½	4½	5	5	5½	6	6½	7
12	4½	5	5	5½	6	6½	7	7½
14	4½	5	5½	6	6½	7	7½	8
16	5	5	5½	6	6½	7	7½	8
18	5	5½	6	6½	7	7½	8	8½
20-22	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



nom. pipe size	O.D. of pipe	single layer nom. 1" actual	nom. 1" O.D.	nom. 1½" actual	nom. 1½" O.D.
¾"	1.05"	1.18	2.86	1.49	3.50
1"	1.32"	1.11	2.86	1.42	3.50
1¼"	1.66"	1.06	2.86	1.81	4.00
1½"	1.90"	.98	2.86	1.56	4.00
2"	2.38"	1.17	3.50	1.42	4.00
2½"	2.88"	1.05	3.50	1.85	4.00
3"	3.50"	1.17	4.00	1.42	4.38
3½"	4.00"	.91	4.00	1.41	5.00
4"	4.50"	.91	4.00	1.45	5.56
4½"	5.00"	.81	5.00	1.73	6.00

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 19.

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"	.40"	1.00	2.00	1.00	4.00	2.00	5.00	2.00	5.00	3.00	7.00	⅛"x1 / 1"x1	⅛"x1 / 1"x1½	⅛"x1½ / 1"x2	⅛"x1½ / 1"x2½	⅛"x2 / 1"x2½	⅛"x2 / 1"x3	1"x2½ / 1"x3	1"x3 / 1"x3
¼"	.54"	.98	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	¼"x1 / 1"x1½	¼"x1 / 1"x2	¼"x1½ / 1"x2½	¼"x1½ / 1"x3	¼"x2 / 1"x3	¼"x2 / 1"x3½	1"x3 / 1"x3½	1"x3 / 1"x4
⅜"	.67"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	⅜"x1 / 1"x1½	⅜"x1 / 1"x2	⅜"x1½ / 1"x2½	⅜"x1½ / 1"x3	⅜"x2 / 1"x3	⅜"x2 / 1"x3½	1"x3 / 1"x3½	1"x3 / 1"x4
½"	.84"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	½"x1 / 1"x1½	½"x1 / 1"x2	½"x1½ / 1"x2½	½"x1½ / 1"x3	½"x2 / 1"x3	½"x2 / 1"x3½	1"x3 / 1"x3½	1"x3 / 1"x4
¾"	1.05"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	¾"x1 / 1"x1½	¾"x1 / 1"x2	¾"x1½ / 1"x2½	¾"x1½ / 1"x3	¾"x2 / 1"x3	¾"x2 / 1"x3½	1"x3 / 1"x3½	1"x3 / 1"x4
1"	1.32"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	1"x1 / 1"x1½	1"x1 / 1"x2	1"x1½ / 1"x2½	1"x1½ / 1"x3	1"x2 / 1"x3	1"x2 / 1"x3½	1"x3 / 1"x3½	1"x3 / 1"x4
1¼"	1.66"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	1¼"x1 / 1"x1½	1¼"x1 / 1"x2	1¼"x1½ / 1"x2½	1¼"x1½ / 1"x3	1¼"x2 / 1"x3	1¼"x2 / 1"x3½	1"x3 / 1"x3½	1"x3 / 1"x4
1½"	1.90"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	1½"x1 / 1"x1½	1½"x1 / 1"x2	1½"x1½ / 1"x2½	1½"x1½ / 1"x3	1½"x2 / 1"x3	1½"x2 / 1"x3½	1"x3 / 1"x3½	1"x3 / 1"x4
2"	2.38"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	2"x1 / 1"x1½	2"x1 / 1"x2	2"x1½ / 1"x2½	2"x1½ / 1"x3	2"x2 / 1"x3	2"x2 / 1"x3½	2"x3 / 1"x3½	2"x3 / 1"x4
2½"	2.88"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	2½"x1 / 1"x1½	2½"x1 / 1"x2	2½"x1½ / 1"x2½	2½"x1½ / 1"x3	2½"x2 / 1"x3	2½"x2 / 1"x3½	2½"x3 / 1"x3½	2½"x3 / 1"x4
3"	3.50"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	3"x1 / 1"x1½	3"x1 / 1"x2	3"x1½ / 1"x2½	3"x1½ / 1"x3	3"x2 / 1"x3	3"x2 / 1"x3½	3"x3 / 1"x3½	3"x3 / 1"x4
3½"	4.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	3½"x1 / 1"x1½	3½"x1 / 1"x2	3½"x1½ / 1"x2½	3½"x1½ / 1"x3	3½"x2 / 1"x3	3½"x2 / 1"x3½	3½"x3 / 1"x3½	3½"x3 / 1"x4
4"	4.50"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	4"x1 / 1"x1½	4"x1 / 1"x2	4"x1½ / 1"x2½	4"x1½ / 1"x3	4"x2 / 1"x3	4"x2 / 1"x3½	4"x3 / 1"x3½	4"x3 / 1"x4
4½"	5.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	4½"x1 / 1"x1½	4½"x1 / 1"x2	4½"x1½ / 1"x2½	4½"x1½ / 1"x3	4½"x2 / 1"x3	4½"x2 / 1"x3½	4½"x3 / 1"x3½	4½"x3 / 1"x4
5"	5.56"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	5"x1 / 1"x1½	5"x1 / 1"x2	5"x1½ / 1"x2½	5"x1½ / 1"x3	5"x2 / 1"x3	5"x2 / 1"x3½	5"x3 / 1"x3½	5"x3 / 1"x4
6"	6.62"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	6"x1 / 1"x1½	6"x1 / 1"x2	6"x1½ / 1"x2½	6"x1½ / 1"x3	6"x2 / 1"x3	6"x2 / 1"x3½	6"x3 / 1"x3½	6"x3 / 1"x4
7"	7.62"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	7"x1 / 1"x1½	7"x1 / 1"x2	7"x1½ / 1"x2½	7"x1½ / 1"x3	7"x2 / 1"x3	7"x2 / 1"x3½	7"x3 / 1"x3½	7"x3 / 1"x4
8"	8.62"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	8"x1 / 1"x1½	8"x1 / 1"x2	8"x1½ / 1"x2½	8"x1½ / 1"x3	8"x2 / 1"x3	8"x2 / 1"x3½	8"x3 / 1"x3½	8"x3 / 1"x4
9"	9.62"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	9"x1 / 1"x1½	9"x1 / 1"x2	9"x1½ / 1"x2½	9"x1½ / 1"x3	9"x2 / 1"x3	9"x2 / 1"x3½	9"x3 / 1"x3½	9"x3 / 1"x4
10"	10.75"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	10"x1 / 1"x1½	10"x1 / 1"x2	10"x1½ / 1"x2½	10"x1½ / 1"x3	10"x2 / 1"x3	10"x2 / 1"x3½	10"x3 / 1"x3½	10"x3 / 1"x4
11"	11.75"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	11"x1 / 1"x1½	11"x1 / 1"x2	11"x1½ / 1"x2½	11"x1½ / 1"x3	11"x2 / 1"x3	11"x2 / 1"x3½	11"x3 / 1"x3½	11"x3 / 1"x4
12"	12.75"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	12"x1 / 1"x1½	12"x1 / 1"x2	12"x1½ / 1"x2½	12"x1½ / 1"x3	12"x2 / 1"x3	12"x2 / 1"x3½	12"x3 / 1"x3½	12"x3 / 1"x4
13"	13.88"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	13"x1 / 1"x1½	13"x1 / 1"x2	13"x1½ / 1"x2½	13"x1½ / 1"x3	13"x2 / 1"x3	13"x2 / 1"x3½	13"x3 / 1"x3½	13"x3 / 1"x4
14"	14.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	14"x1 / 1"x1½	14"x1 / 1"x2	14"x1½ / 1"x2½	14"x1½ / 1"x3	14"x2 / 1"x3	14"x2 / 1"x3½	14"x3 / 1"x3½	14"x3 / 1"x4
15"	15.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	15"x1 / 1"x1½	15"x1 / 1"x2	15"x1½ / 1"x2½	15"x1½ / 1"x3	15"x2 / 1"x3	15"x2 / 1"x3½	15"x3 / 1"x3½	15"x3 / 1"x4
16"	16.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	16"x1 / 1"x1½	16"x1 / 1"x2	16"x1½ / 1"x2½	16"x1½ / 1"x3	16"x2 / 1"x3	16"x2 / 1"x3½	16"x3 / 1"x3½	16"x3 / 1"x4
17"	17.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	17"x1 / 1"x1½	17"x1 / 1"x2	17"x1½ / 1"x2½	17"x1½ / 1"x3	17"x2 / 1"x3	17"x2 / 1"x3½	17"x3 / 1"x3½	17"x3 / 1"x4
18"	18.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	18"x1 / 1"x1½	18"x1 / 1"x2	18"x1½ / 1"x2½	18"x1½ / 1"x3	18"x2 / 1"x3	18"x2 / 1"x3½	18"x3 / 1"x3½	18"x3 / 1"x4
19"	19.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	19"x1 / 1"x1½	19"x1 / 1"x2	19"x1½ / 1"x2½	19"x1½ / 1"x3	19"x2 / 1"x3	19"x2 / 1"x3½	19"x3 / 1"x3½	19"x3 / 1"x4
IP 20"	20.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	20"x1 / 1"x1½	20"x1 / 1"x2	20"x1½ / 1"x2½	20"x1½ / 1"x3	20"x2 / 1"x3	20"x2 / 1"x3½	20"x3 / 1"x3½	20"x3 / 1"x4
21"	21.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	21"x1 / 1"x1½	21"x1 / 1"x2	21"x1½ / 1"x2½	21"x1½ / 1"x3	21"x2 / 1"x3	21"x2 / 1"x3½	21"x3 / 1"x3½	21"x3 / 1"x4
22"	22.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	22"x1 / 1"x1½	22"x1 / 1"x2	22"x1½ / 1"x2½	22"x1½ / 1"x3	22"x2 / 1"x3	22"x2 / 1"x3½	22"x3 / 1"x3½	22"x3 / 1"x4
23"	23.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	23"x1 / 1"x1½	23"x1 / 1"x2	23"x1½ / 1"x2½	23"x1½ / 1"x3	23"x2 / 1"x3	23"x2 / 1"x3½	23"x3 / 1"x3½	23"x3 / 1"x4
24"	24.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	24"x1 / 1"x1½	24"x1 / 1"x2	24"x1½ / 1"x2½	24"x1½ / 1"x3	24"x2 / 1"x3	24"x2 / 1"x3½	24"x3 / 1"x3½	24"x3 / 1"x4
25"	25.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	25"x1 / 1"x1½	25"x1 / 1"x2	25"x1½ / 1"x2½	25"x1½ / 1"x3	25"x2 / 1"x3	25"x2 / 1"x3½	25"x3 / 1"x3½	25"x3 / 1"x4
26"	26.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	26"x1 / 1"x1½	26"x1 / 1"x2	26"x1½ / 1"x2½	26"x1½ / 1"x3	26"x2 / 1"x3	26"x2 / 1"x3½	26"x3 / 1"x3½	26"x3 / 1"x4
27"	27.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	27"x1 / 1"x1½	27"x1 / 1"x2	27"x1½ / 1"x2½	27"x1½ / 1"x3	27"x2 / 1"x3	27"x2 / 1"x3½	27"x3 / 1"x3½	27"x3 / 1"x4
28"	28.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	28"x1 / 1"x1½	28"x1 / 1"x2	28"x1½ / 1"x2½	28"x1½ / 1"x3	28"x2 / 1"x3	28"x2 / 1"x3½	28"x3 / 1"x3½	28"x3 / 1"x4
29"	29.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	29"x1 / 1"x1½	29"x1 / 1"x2	29"x1½ / 1"x2½	29"x1½ / 1"x3	29"x2 / 1"x3	29"x2 / 1"x3½	29"x3 / 1"x3½	29"x3 / 1"x4
30"	30.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	30"x1 / 1"x1½	30"x1 / 1"x2	30"x1½ / 1"x2½	30"x1½ / 1"x3	30"x2 / 1"x3	30"x2 / 1"x3½	30"x3 / 1"x3½	30"x3 / 1"x4
31"	31.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	31"x1 / 1"x1½	31"x1 / 1"x2	31"x1½ / 1"x2½	31"x1½ / 1"x3	31"x2 / 1"x3	31"x2 / 1"x3½	31"x3 / 1"x3½	31"x3 / 1"x4
32"	32.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	32"x1 / 1"x1½	32"x1 / 1"x2	32"x1½ / 1"x2½	32"x1½ / 1"x3	32"x2 / 1"x3	32"x2 / 1"x3½	32"x3 / 1"x3½	32"x3 / 1"x4
33"	33.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	33"x1 / 1"x1½	33"x1 / 1"x2	33"x1½ / 1"x2½	33"x1½ / 1"x3	33"x2 / 1"x3	33"x2 / 1"x3½	33"x3 / 1"x3½	33"x3 / 1"x4
34"	34.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	34"x1 / 1"x1½	34"x1 / 1"x2	34"x1½ / 1"x2½	34"x1½ / 1"x3	34"x2 / 1"x3	34"x2 / 1"x3½	34"x3 / 1"x3½	34"x3 / 1"x4
35"	35.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	35"x1 / 1"x1½	35"x1 / 1"x2	35"x1½ / 1"x2½	35"x1½ / 1"x3	35"x2 / 1"x3	35"x2 / 1"x3½	35"x3 / 1"x3½	35"x3 / 1"x4
36"	36.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	36"x1 / 1"x1½	36"x1 / 1"x2	36"x1½ / 1"x2½	36"x1½ / 1"x3	36"x2 / 1"x3	36"x2 / 1"x3½	36"x3 / 1"x3½	36"x3 / 1"x4
37"	37.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	37"x1 / 1"x1½	37"x1 / 1"x2	37"x1½ / 1"x2½	37"x1½ / 1"x3	37"x2 / 1"x3	37"x2 / 1"x3½	37"x3 / 1"x3½	37"x3 / 1"x4
38"	38.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	38"x1 / 1"x1½	38"x1 / 1"x2	38"x1½ / 1"x2½	38"x1½ / 1"x3	38"x2 / 1"x3	38"x2 / 1"x3½	38"x3 / 1"x3½	38"x3 / 1"x4
39"	39.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	39"x1 / 1"x1½	39"x1 / 1"x2	39"x1½ / 1"x2½	39"x1½ / 1"x3	39"x2 / 1"x3	39"x2 / 1"x3½	39"x3 / 1"x3½	39"x3 / 1"x4
40"	40.00"	1.00	2.00	1.46	4.00	1.98	5.00	2.78	5.00	3.78	7.00	40"x1 / 1"x1½	40"x1 / 1"x2	40"x1½ / 1"x2½	40"x1½ / 1"x3	40"x2 / 1"x3	40"x2 / 1"x3½	40"x3 / 1"x3½	40"x3 / 1"x4

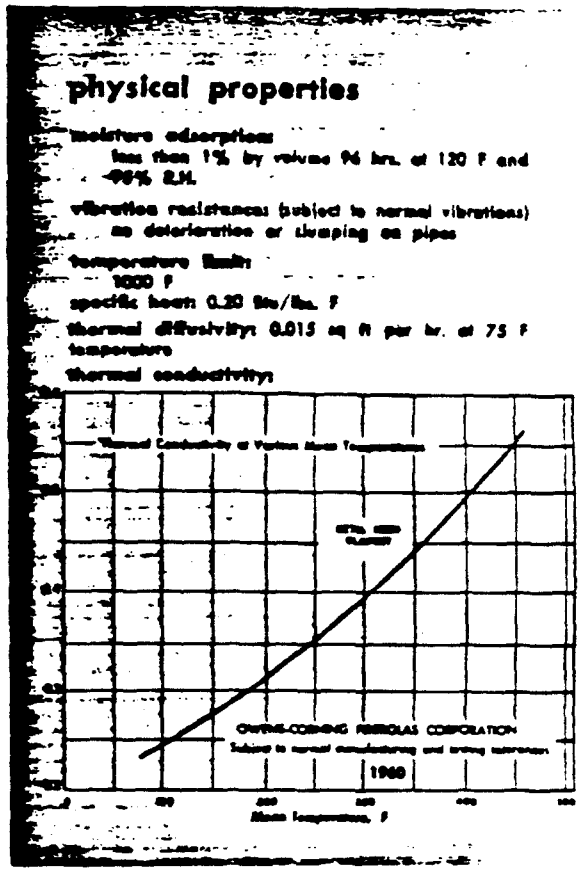
Insulation for the nominal pipe sizes range of 25"-39" is furnished in three K-Segmental curvature sizes. Approximately six to eight segments are required to enclose pipes in this size range. The last segment applied must be cut to fit accurately. Letter designates molded K-Segmental size for proper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

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"

blanket type pipe insulation

for large high pressure steam lines up to 1000 F operating temp.



Fiberglas Blanket Type Insulation consists of Fiberglas Wool faced on one side with wire mesh. This strong wire mesh, secured to the insulation by asbestos or metal yarn ties, is fabricated to the right length to fit the specified pipe size.

Selvages provided along the edges of the blanket for long lasting, easy application are fabricated from heavy-gauge sheet metal. Folded twice and crimped about the cut ends of the wire, the selvages form a ⅜ inch wide metal edge for tying blanket together about pipe. Low "k" of this insulating material averages 0.39 Btu/(hr.) (sq. ft.) (F/in.) at 300 F mean temperature.

Fiberglas Blanket Type Pipe Insulation offers the perfect solution to the insulation problems of many high pressure steam lines operating at temperatures up to 1000 F. Its flexible inner surface combined with its high thermal efficiency makes it ideal for insulating pipes of irregular shape and dimension. Incombustible blanket type pipe insulation reduces fire danger under *normal operating conditions.*

sizes

iron pipe—3" to 36" in diameter in blanket lengths 12" through 138¼" in ⅛" increments depending upon pipe size

widths—24" nominal blanket width

applied thickness—1", 1½", 2", 2½", 3" and 4"

finishes

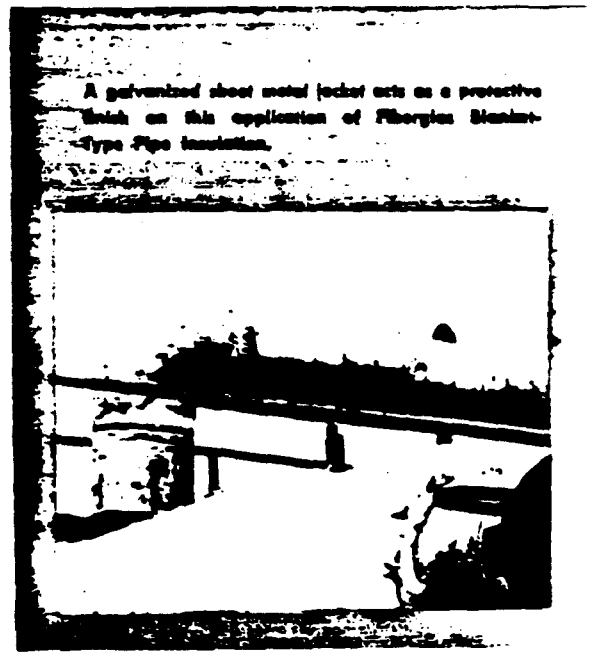
sheet metal jacket—Both indoor and outdoor piping applications of Fiberglas Blanket Type Insulation are recommended finished with sheet metal. Jacket seams are lapped 2 inches for weather protection and secured in place with sheet metal screws on 6-inch centers. An alternate method for securing the seams is the use of ½ inch galvanized or stainless steel metal bands. A sheet metal screw attached at each lap of jacket sections will prevent slippage on vertical runs of pipe.

limitations

Fiberglas Blanket Type Pipe Insulation should not be used on piping where operating temperatures exceed 1000 F.

It should be adequately protected in locations where it is subject to mechanical abuse or weathering.

All values given are subject to normal manufacturing and testing tolerances.



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recommended thicknesses*

The table below is designed to serve as a guide to recommended thicknesses of Fiberglas Blanket Type Pipe Insulation. Thicknesses are recommended for temperatures up to 1000 F and for various pipe size ranges from 3 inches to 12 inches and up. Recommended thicknesses determined by allowable surface temperature differences.

Temperature range F.	nominal pipe sizes (inches)		
	3-4½	5-10	12 and Up
Up to 200	1	1	1
201 to 400	1½	1½	1½
401 to 600	1½	2	2
601 to 700	2	2½	2½
701 to 800	3	3	3½
801 to 900	3½	4	5
901 to 1000	4	5	6
901 to 1000	5	6	7½

* The thicknesses shown here are generalized recommendations. 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.

specification

applicable specification

HH-I-552 Insulation Pipe Covering, Thermal, and Insulation Blanket, Thermal, Pipe Covering
Type II

1. Insulating materials

All piping 3 inches in diameter and over, where noted on the drawings or listed in the schedules, shall be insulated to the thickness shown in the table with Fiberglas Blanket Type Pipe Insulation, as manufactured by Owens-Corning Fiberglas Corporation. (Add ½" to all thicknesses for all lines located outdoors.)

2. Application

Fiberglas Blanket Type Pipe Insulation shall be applied over clean dry surfaces with all edges tightly fitted together. The longitudinal selvage edges shall be banded, laced or tied together with 16 ga. galvanized soft annealed wire.

Flanges, valves and fittings shall be insulated with blanket-type pipe insulation of thickness equal to that on adjacent piping. It shall be formed to fit and cut where required. All cut edges shall be laced together with 16 ga. galvanized soft annealed wire.

3. Surface finish

The finish for outdoor piping shall be a 28 gauge galvanized sheet metal jacket. Seams shall be lapped 2 inches against the weather and secured in place with sheet metal screws on 6-inch centers or ½ inch galvanized metal bands, on not over 12-inch centers. Vertical runs of pipe shall have a sheet metal screw attached at all laps between sections of jacket to prevent slippage.

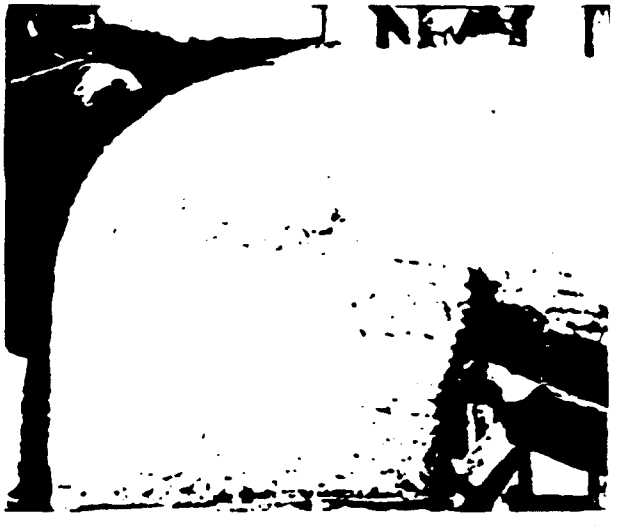
All insulation on flanges, valves and fillings located outdoors shall be covered with Foster HI Mastic or equal, reinforced with an open mesh glass fabric. Mastic shall be applied in two coats of sufficient thickness to give a ⅛" dry film and shall be troweled neatly over the fitting and lapped over the jacket on the adjacent pipe.

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.

application details

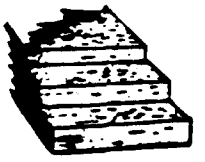
▲ Blanket Type Pipe Insulation is installed over clean dry piping. Blanket is merely wrapped around pipe. All edges are tightly fitted together for fastening.

▲ The longitudinal selvage edges are tied together with No. 16 gauge soft-iron galvanized wire. An alternate method is the use of a banding tool.

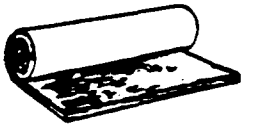


▲ On bends, the selvages are tied together on the outside radius of the bend. The wire mesh on the inside radius of the bend is shortened to conform to the contour of the pipe.

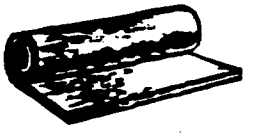
FOR WARM AIR DUCTS

requirements	service* temperature	product	available thickness	standard sizes
for external application on exposed or concealed warm air ducts	up to 250 F	 rigid duct insulation	½", ¾", 1" 1½", 2"	24" x 48"
for external application on all exposed round and concealed rectangular hot air ducts	up to 250 F	 flexible duct insulation	½", 1" 1½", 2"	width— 24", 36", 48" length— 200', 100', 50'

FOR AIR CONDITIONING AND DUAL SYSTEM

for external application on exposed or concealed dual or cold air ducts	SF-up to 150 F FF-up to 250 F	 rigid vapor-seal duct insulation	¾", 1" 1½", 2"	24" x 48" 48" x 48" 48" x 72"
for external application on all concealed and exposed round cold air ducts	up to 250 F	 flexible vapor-seal duct insulation	½", 1" 1½", 2"	width— 24", 36", 48" length— 100', 50'

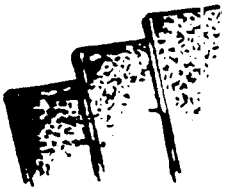
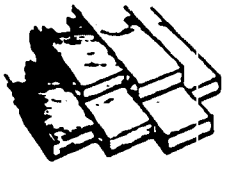
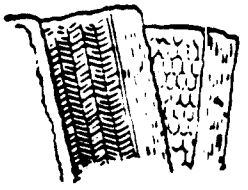
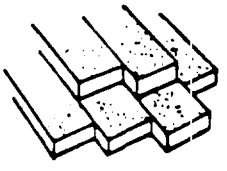
FOR DUCT LINING, ACOUSTICAL

for internal application on cold and hot air ducts	up to 250 F	 rigid coated duct liner	½", 1" 1½", 2"	24" x 48"
for internal application on all rectangular and round cold and hot air conditioning ducts	up to 250 F	 coated flexible duct liner	½", 1" 1½", 2"	width— 36", 48" length— 100', 200', 50'

*Service temperatures are for the facing and insulation for the requirements shown.

INDUSTRIAL INSULATIONS

FOR EQUIPMENT

requirements	service* temperature	product	available thickness	standard sizes
for heated or cooled equipment	up to 450 F	 rigid equipment insulation	PF 614— ¾"-4½" PF 615— ½"-3" PF 617— ½"-2¼"	width—24" length—48"
for condensers, evaporator kilns and other medium temperature equipment	up to 450 F	 block insulation	¾", 1", 1¼", 1½", 2"	widths—6", 1 length—36'
for tanks, ovens and other high temperature equipment	up to 1000 F	 metal mesh blankets	1"-6" in ½" increments	widths— 12" to 24" length— 24" to 96"
for very high temperature equipment	up to 1100 F	 Kaylo & Kaylo 20 block insulation	1", 1½", 2", 2½", 3", 3½", 4"	widths—3", 6 12" & 18" length— 18" & 36"

*Service temperatures are for the jacket and insulation for requirements shown.

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OWENS-CORNING FIBERGLAS CORP.

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

PIPE INSULATIONS FIBERGLAS

Where to buy

Fiberglas Pipe Insulations

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	HE	8-6021
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	8-4468
Omaha, Nebraska		346-2989
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	WA	2-5467
St. Louis, Missouri	PA	5-1061
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

OWENS-CORNING FIBERGLAS
INTERNATIONAL S. A.

GENERAL OFFICE:

Panama, Republic de Panama,
Apartado 6718, Phone: 5-1650

BRANCH OFFICES:

New York 22, New York, 717 Fifth Avenue,
Plaza 9-3810

San Francisco 7, Calif., 1200 17th Street,
Underhill 1-4721

San Juan, P. R., First Federal Savings,
Condominium, 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.

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