For service to 1900F...

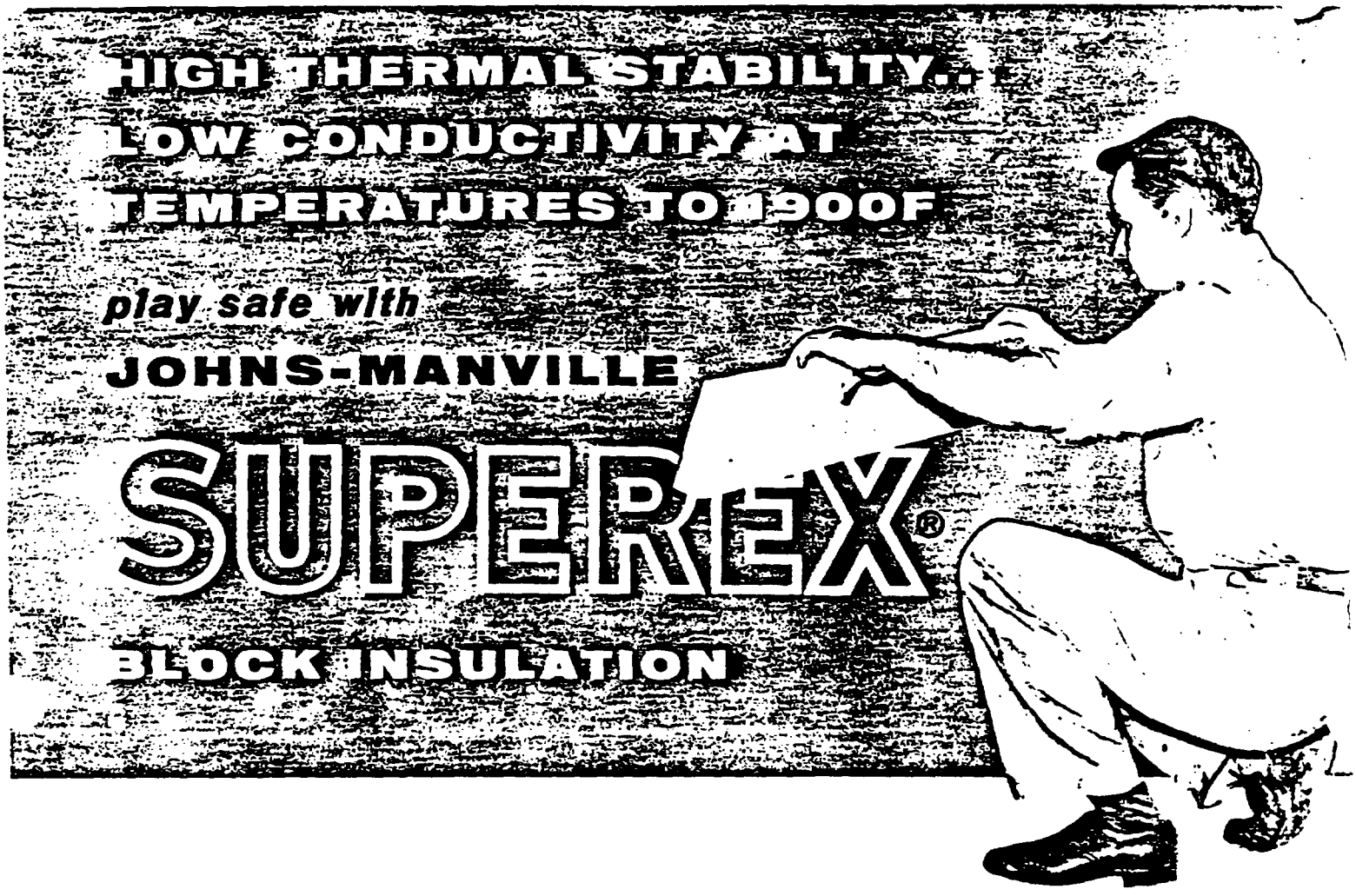
JOHNS-MANVILLE

SUPEREX®

PIPE AND BLOCK INSULATION

...with exceptional heat resistance and excellent insulating value

Wherever the job calls for



For over a quarter of a century, Johns-Manville Superex has been the leading high temperature block insulation for service to 1900F. Its unique combination of low conductivity and high stability at high temperatures provides greater operating efficiency and longer, maintenance-free service.

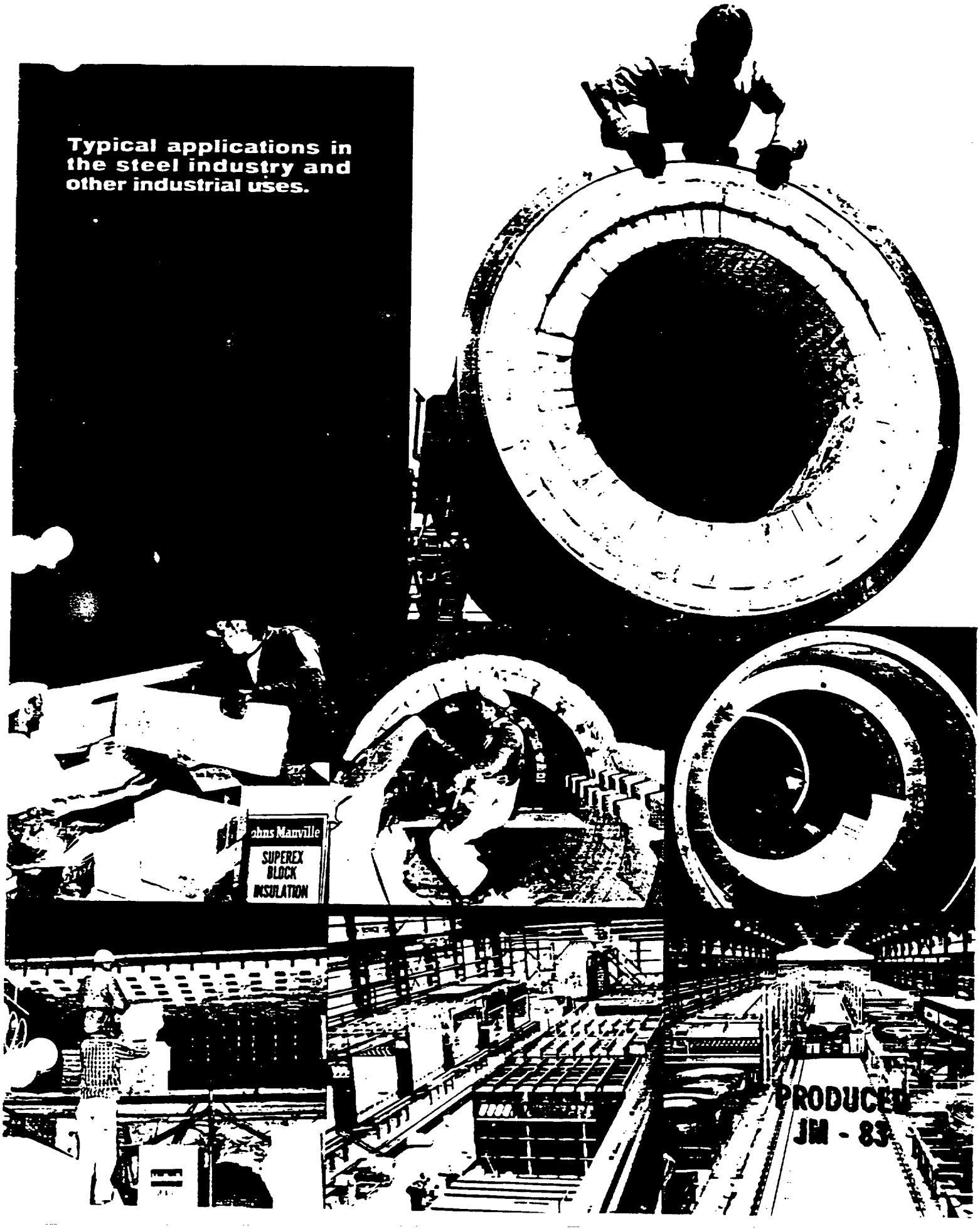
Made from diatomaceous silica and asbestos. Superex is so strong it easily withstands the daily punishment encountered in normal service. It compresses only ⅛ inch under 6 tons' pressure per square foot.

Ever since its introduction, Superex has demonstrated its versatility as a high temperature insulation. Today, for example, it economically insulates 90% of this country's hot blast stoves. In addition, it has proved its superiority as an insulation for most types of industrial and metallurgical furnaces and ovens, soaking pits, high temperature mains and flues, stationary and marine boilers, regenerators, kilns and roasters.

Superex provides major economies by reducing fuel, construction and maintenance costs.

For medium temperature applications to 1600F, Johns-Manville makes Superex-M—a diatomaceous earth block insulation possessing lower density and conductivity. Superex-M is also furnished in pipe insulation form for use in combination with other high temperature insulating materials (see page 5).

Typical applications in the steel industry and other industrial uses.



J-M SUPEREX AND SUPEREX-M

PHYSICAL AND THERMAL PROPERTIES*

Property	Value: Superex Block Insulation	Value: Superex-M Block and Pipe Insulation
Density, dry, lb per cu ft	24	21
Transverse Strength, Modulus of Rupture, psi	70	90
Compressive Strength, psi to produce 5% compression	85	70
Linear Shrinkage, percent (After 24-hr soaking heat at indicated temperature)	2.7 at 1900F	2.0 at 1600F
Maximum Service Temperature	1900F	1600F
Thermal Conductivity at Mean Temperature (Btu in. per sq ft per F per hr)	300F 0.67 / 400F 0.69 / 500F 0.71 / 600F 0.73 / 700F 0.75 / 800F 0.77 / 900F 0.79 / 1000F 0.82	300F 0.61 / 400F 0.62 / 500F 0.64 / 600F 0.66 / 700F 0.68 / 800F 0.69 / 900F 0.71 / 1000F 0.74

*The figures given in this table are average values obtained in accordance with accepted test methods.

FEDERAL SPECIFICATION COMPLIANCE:

Superex Block—MIL-I-2819D, Classes III and IV
Superex-M Pipe Insulation—MIL-I-2781D Grade III Type 2

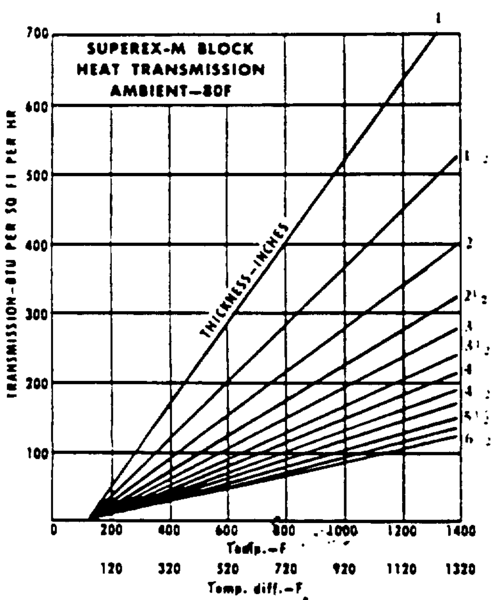
PIPE INSULATION

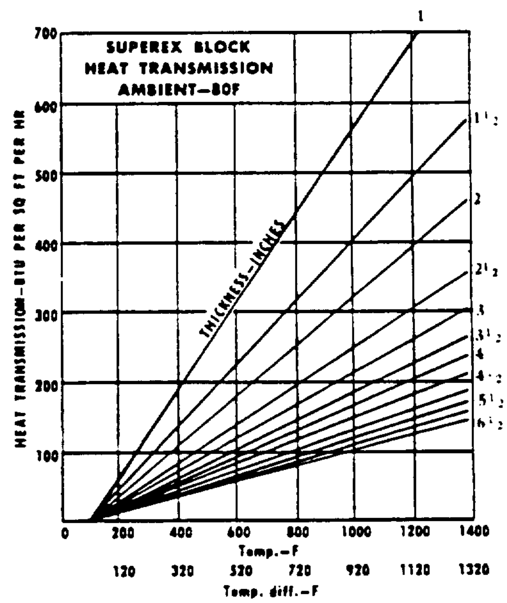
Standard Sizes		
Length	Thickness, in. (for IR standard pipe sizes)	[illegible]
3-ft sections and segments	[illegible]	[illegible] furnished for 1½" and [illegible] up to 11" pipe size

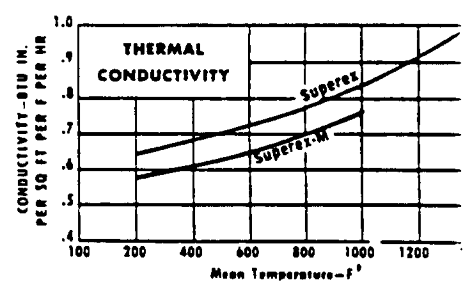
Approximate Weight [illegible]

Insulation thickness, inches	½	¾	1	1¼	1½	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10	11	12
1	2.54	2.84	3.19	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	—
1½	4.83	5.27	5.82	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	26.5
2	7.84	8.40	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2½	11.5	12.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	15.9	16.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

*Based on nominal thickness.







BLOCK INSULATION

Standard Sizes

Length, in.	Width, in.	Thickness, in.
18 and 36	3 and 6 flat or curved	1 through 4
	9 and 12 flat only	1½ through 4

NOTE: *For special sizes and curved blocks, consult your nearest Johns-Manville office.*

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J-M SUPEREX-M · COMBINATION INSULATION

Superex-M is often used in combination with other J-M insulations to give greater insulating value for a given service temperature and insulating thickness. In such cases, the Superex-M is always placed next to the hot surface in sufficient thickness to reduce the temperature on the outer layer to its safe limit. Such a combination, with its higher insulating value, serves to reduce the heat loss over that of Superex used alone.

Superex-M Combination Insulation usually consists of Superex-M and Thermobestos®. (See tables and chart below for recommended thickness of block and pipe insulation.)

BLOCK

RECOMMENDED THICKNESS IN INCHES OF BLOCK INSULATION ON METAL SURFACES

Utility—Steam Generation

Temperature of Surface F	Inner Layer: Superex-M	Outer Layer: Thermobestos	Total Thickness of Block Insulation
100-299	–	1½	1½
300-399	–	2	2
400-499	–	2½	2½
500-699	–	3	3
700-799	1½	2	3½
800-999	1½	2½	4
1000-1199	2½	2	4½
1200-1399	3	2	5

Process Industries

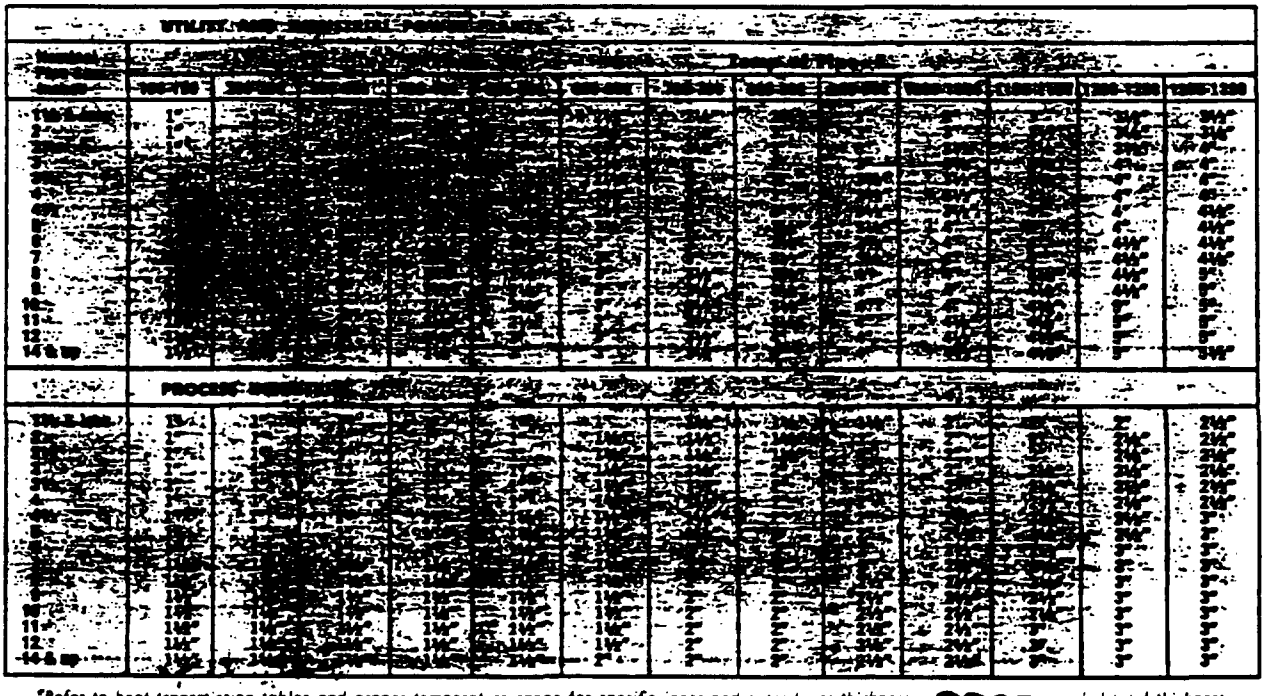
Temperature of Surface F	Inner Layer: Superex-M	Outer Layer: Thermobestos	Total Thickness of Block Insulation
100-599	–	1½	1½
600-699	–	2	2
700-899	1	1	2
900-1099	1½	1	2½
1100-1399	2	1	3

NOTE: *Up to 1200F, double layer Thermobestos can be used in place of combination materials.*

PIPE

RECOMMENDED TOTAL THICKNESS, INCHES, FOR SUPEREX-M COMBINATION PIPE INSULATION*

(Superex-M Inner Layer and J-M Thermobestos Outer Layer)



*Refer to heat transmission tables and proper temperature range for specific inner and outer layer thicknesses [illegible] thickness.

PIPE INSULATION HEAT TRANSMISSION

Expressed in Btu per linear foot per hour

Johns-Manville THERMOBESTOS...for extra strength, minimum heat loss, maximum moisture resistance

The consistently outstanding performance of Thermobestos pipe and block insulation at temperatures up to 1200F has made it an excellent outer layer when double layer construction is used. Combined with Superex-M, it provides long-lasting insulating service in the steel industry and similar applications.

The light weight of Thermobestos makes it easy to handle for fast application and its exceptional structural strength protects against breakage and hard service use. Its low conductivity makes possible accurate, uniform temperature control, helps reduce fuel costs and contributes materially to operating efficiency.

For further information on Johns-Manville Thermobestos pipe and block insulation, write for Brochure IN-169A.

Listed below and on the following pages are recommended thicknesses of J–M Superex-M and Thermobestos Combination Pipe Insulation at various service temperatures.

J-M Thermobestos

PHYSICAL AND THERMAL PROPERTIES*

Property	Value						
Density (dry)	11 lb. per cu. ft.						
Transverse Strength (modulus of rupture)	95 psi						
Compressive Strength (based on 2" thickness of block)	185 psi to produce 6% compression						
Linear Shrinkage	1.5% after 24-hr. soaking period at 1200 F						
Maximum Service Temperature	1200 F						
Conductivity at Mean Temperature	100F	200F	300F	400F	500F	600F	700F
(Btu in. per sq. ft. per F per hr.)	.33	.37	.41	.46	.50	.55	.60

*The figures given in this table are average values obtained in accordance with accepted test methods.

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J-M SUPEREX-M · THERMOBESTOS COMBINATION

Nominal Pipe Size—Inches	Pipe Temp. F.	Nominal Insulation Thickness—Inches: Superex-M	Nominal Insulation Thickness—Inches: Thermobestos	Junction Temp. F.	Outside Surface Temp. F.	Btu
1/2	700	1 1/2	...	...	153	116.
1/2	700	2	...	...	136	104.
1/2	700	2 1/2	...	...	120	92.1
1/2	800	1 1/2	...	...	163	137.
1/2	800	2	...	...	144	123.
1/2	800	2 1/2	...	...	126	109.
1/2	900	1 1/2	...	...	172	159.
1/2	900	2	...	...	152	142.
1/2	900	2 1/2	...	...	132	125.
1/2	900	1 1/2	1 1/2	438	119	104.
1/2	1000	1 1/2	...	...	181	181.
1/2	1000	2	...	...	159	162.
1/2	1000	2 1/2	...	...	138	143.
1/2	1000	1 1/2	1 1/2	481	124	120.
1/2	1100	2	...	...	167	182.
1/2	1100	2 1/2	...	...	143	161.
1/2	1100	1 1/2	1 1/2	523	129	135.
1/2	1200	2	...	...	174	203.
1/2	1200	2 1/2	...	...	149	179.
1/2	1200	1 1/2	1 1/2	566	134	152.
1/2	1200	2	1 1/2	493	127	146.
1/2	1300	2	...	...	180	225.
1/2	1300	2 1/2	...	...	155	198.
1/2	1300	1 1/2	1 1/2	608	139	169.
1/2	1300	2	1	471	141	173.
1/2	1300	2	1 1/2	529	131	163.
1/2	1400	2 1/2	...	...	160	217.
1/2	1400	2	1	503	146	191.
1/2	1400	2	1 1/2	566	136	179.
3/4	700	1 1/2	...	...	161	133.
3/4	700	2	...	...	142	117.
3/4	700	2 1/2	...	...	124	103.
3/4	800	1 1/2	...	...	171	157.
3/4	800	2	...	...	150	139.
3/4	800	2 1/2	...	...	131	121.
3/4	900	1 1/2	...	...	181	182.
3/4	900	2	...	...	159	161.
3/4	900	2 1/2	...	...	137	140.
3/4	900	1 1/2	1 1/2	465	122	115.
3/4	1000	1 1/2	...	...	190	208.
3/4	1000	2	...	...	167	183.
3/4	1000	2 1/2	...	...	143	160.
3/4	1000	1 1/2	1 1/2	511	128	131.
3/4	1100	2	...	...	174	206.
3/4	1100	2 1/2	...	...	150	180.
3/4	1100	1 1/2	1 1/2	557	133	148.
3/4	1200	2	...	...	182	230.
3/4	1200	2 1/2	...	...	156	200.
3/4	1200	1 1/2	1 1/2	602	138	167.
3/4	1200	2	1 1/2	523	131	160.
3/4	1300	2	...	...	189	255.
3/4	1300	2 1/2	...	...	162	221.
3/4	1300	1 1/2	1 1/2	648	144	186.
3/4	1300	2	1	502	145	191.
3/4	1300	2	1 1/2	562	135	178.
3/4	1400	2 1/2	...	...	187	243.
3/4	1400	2	1	536	151	211.
3/4	1400	2	1 1/2	601	140	197.
1	700	1 1/2	...	...	159	145.
1	700	1	1	380	134	111.
1	700	1 1/2	1	322	123	103.
1	800	1 1/2	...	...	169	171.
1	800	1	1	427	142	132.
1	800	1 1/2	1	380	130	122.

PIPE INSULATION HEAT TRANSMISSION

Expressed in Btu per linear foot per hour

J-M SUPEREX-M · THERMOBESTOS COMBINATION

Nominal Pipe Size—Inches	Pipe Temp. F.	Nominal Insulation Thickness—Inches		Junction Temp. F.	Outside Surface Temp. F.	Btu
		Superex-M	Thermobestos			
1	900	1½			178	198.
1	900	1	1	473	150	133.
1	900	1½	1	398	137	142.
1	900	1½	1½	446	127	129.
1	1000	1½			187	227.
1	1000	1	1	519	158	176.
1	1000	1½	1	436	144	163.
1	1000	1½	1½	489	133	148.
1	1100	1	1	565	165	200.
1	1100	1½	1	474	150	184.
1	1100	1½	1½	532	138	168.
1	1200	1	1	610	173	225.
1	1200	1½	1	511	157	206.
1	1200	1½	1½	575	144	189.
1	1200	2	1½	494	136	180
1	1300	1	1	656	180	251
1	1300	1½	1	549	163	229.
1	1300	1½	1½	619	150	210.
1	1300	2	1	462	151	216.
1	1300	2	1½	530	141	200.
1	1400	1½	1	586	169	253.
1	1400	2	1	493	157	238.
1	1400	2	1½	567	146	221.
1¼	700	1½			159	162.
1¼	700	1	1	422	141	128.
1¼	700	1	1½	459	127	112
1¼	800	1½			170	192.
1¼	800	1	1	475	150	153.
1¼	800	1	1½	518	134	133.
1¼	900	1½			179	222.
1¼	900	1	1	527	159	179.
1¼	900	1	1½	577	142	156.
1¼	900	1	1½	608	131	142
1¼	1000	1½			188	254.
1¼	1000	1	1	579	168	206.
1¼	1000	1	1½	635	149	180.
1¼	1000	1	2	670	137	164.
1¼	1000	1½	1½	518	130	158.
1¼	1100	1	1	631	176	235.
1¼	1100	1	1½	693	157	205.
1¼	1100	1½	1½	564	136	179.
1¼	1200	1	1	682	184	265.
1¼	1200	1	1½	751	164	232.
1¼	1200	1½	1	551	153	219.
1¼	1200	1½	1½	611	141	201.
1¼	1200	1½	2	652	133	188.
1¼	1300	1	1	733	192	296.
1¼	1300	1½	1	592	159	244.
1¼	1300	1½	1½	657	147	224.
1¼	1300	1½	2	701	138	209.
1¼	1300	2	1½	578	147	226.
1¼	1400	1½	1	633	165	270.
1¼	1400	1½	1½	703	152	247.
1¼	1400	2	1½	618	153	250.
1½	700	1½			187	183.
1½	700	1	1	428	132	126.
1½	700	1	1½	460	121	112.
1½	800	1½			178	216.
1½	800	1	1	482	141	150.
1½	800	1	1½	518	128	134.
1½	900	1½			188	251.
1½	900	1	1	536	149	176.
1½	900	1	1½	578	135	157.
1½	900	1	2	604	127	144.
1½	1000	1½			197	267.
1½	1000	1	1	589	157	203.
1½	1000	1	1½	636	142	180.
1½	1000	1	2	666	133	167.
1½	1100	1	1	642	164	231.
1½	1100	1	1½	695	149	206.
1½	1100	1	2	727	139	190.
1½	1200	1	1	695	172	260.
1½	1200	1	1	753	156	232.
1½	1200	1	2	788	145	215.
1½	1200	1½	1	584	158	239.
1½	1200	1½	1½	645	145	217.
1½	1200	1½	2	686	136	202.
1½	1300	1	1	747	179	290.
1½	1300	1½	1	628	164	266.
1½	1300	1½	1½	693	151	242.
1½	1300	1½	2	738	142	226.
1½	1400	1½	1	671	171	294.
1½	1400	1½	1½	742	157	268.
1½	1400	1½	2	790	147	250.
2	700	1	1	416	140	151.
2	700	1	1½	452	128	132.
2	700	1	2	416	140	151.
2	800	1	1	468	149	180.
2	800	1	1½	511	136	158.
2	800	1	2	540	126	143.
2	800	1	2½	561	119	131.
2	900	1	1	519	158	211.
2	900	1	1½	568	143	185
2	900	1	2	601	133	167.
2	900	1	2½	626	125	154.
2	1000	1	1	571	167	243.
2	1000	1	1½	626	151	213.
2	1000	1	2	663	139	193.
2	1000	1	2½	690	131	178.
2	1100	1	1	621	175	276.
2	1100	1	1½	682	158	243.
2	1100	1	2	724	146	220.
2	1100	1	2½	754	136	203.
2	1100	1½	1½	576	147	226.
2	1100	1½	2	622	137	208.
2	1100	1½	2½	658	129	193.
2	1200	1	1	672	183	311.
2	1200	1	1½	739	165	274.
2	1200	1½	1	553	167	282.
2	1200	1½	1½	623	154	254.
2	1200	1½	2	673	143	233.
2	1200	1½	2½	713	135	217.
2	1300	1½	1	593	174	314.
2	1300	1½	1½	670	160	283.
2	1300	1½	2	724	149	261.
2	1300	1½	2½	767	140	242.
2	1300	2	2	637	141	246.
2	1400	1½	1	634	181	347.
2	1400	1½	1½	716	166	313.
2	1400	1½	2	775	155	289.
2	1400	2	2	681	146	272.
2½	700	1	1	442	136	159.
2½	700	1	1½	475	125	139.
2½	700	1	2	496	117	126.
2½	800	1	1	499	145	180.
2½	800	1	1½	537	132	167.
2½	800	1	2	562	124	151.
2½	800	1	2½	580	118	140.
2½	900	1	1	555	153	222.
2½	900	1	1½	598	140	195.
2½	900	1	2	626	130	178.
2½	900	1	2½	648	123	164.
2½	1000	1	1	610	162	256.
2½	1000	1	1½	659	147	226.
2½	1000	1	2	691	137	205.
2½	1000	1	2½	715	129	190.
2½	1000	1½	2	546	130	196.
2½	1100	1	1	665	170	292.
2½	1100	1	1½	719	154	257.
2½	1100	1	2	755	143	235.
2½	1100	1½	2	595	136	223.
2½	1100	1½	2½	631	129	208.
2½	1200	1	1	720	178	329.
2½	1200	1	1½	779	161	291.
2½	1200	1	2	818	153	265.
2½	1200	1½	1	516	164	302.
2½	1200	1½	1½	589	151	273.
2½	1200	1½	2	644	141	250.
2½	1200	1½	2½	683	134	234.
2½	1200	2	2	580	135	238.
2½	1300	1½	1	554	170	336.
2½	1300	1½	1½	633	158	304.
2½	1300	1½	2	693	147	279.
2½	1300	2	2	624	140	265.
2½	1300	2	2½	667	133	250.
2½	1400	1½	1	591	177	371.
2½	1400	1½	1½	677	164	336.
2½	1400	1½	2	741	153	309.
2½	1400	2	2	668	145	293.
2½	1400	2	2½	714	138	276.
3	700	1	1	434	146	196.
3	700	1	1½	472	133	168.
3	700	1	2	498	124	150.
3	700	1	2½	518	116	136.
3	800	1	1	488	156	234.
3	800	1	1½	533	141	201.
3	800	1	2	563	131	180.
3	800	1	2½	586	123	163.
3	900	1	1	543	165	274.
3	900	1	1½	594	150	236.
3	900	1	2	628	138	211.
3	900	1	2½	654	129	191.
3	1000	1	1	596	175	316.
3	1000	1	1½	654	158	273.
3	1000	1	2	693	145	244.
3	1000	1	2½	722	136	221.
3	1000	1½	2	602	137	226.
3	1000	1½	2½	634	129	209.
3	1100	1	1	649	183	360.
3	1100	1	1½	714	166	311.
3	1100	1	2	757	153	278.
3	1100	1½	1	538	168	321.
3	1100	1½	1½	606	154	285.
3	1100	1½	2	657	143	258.
3	1100	1½	2½	692	135	238.
3	1200	1½	1	581	175	361.
3	1200	1½	1½	656	161	321.
3	1200	1½	2	711	149	290.
3	1200	1½	2½	750	140	269.
3	1200	2	1½	581	150	296.
3	1200	2	2	633	141	273.
3	1200	2	2½	673	134	255.
3	1300	1½	1	623	182	402.
3	1300	1½	1½	705	167	358.
3	1300	2	1½	624	156	329.
3	1300	2	2	681	147	304.
3	1300	2	2½	725	139	284.
3	1400	1½	1	686	189	445.
3	1400	1½	1½	755	174	397.
3	1400	2	1½	668	162	364.
3	1400	2	2	729	152	337.
3	1400	2	2½	776	144	315.
3½	700	1	1	401	143	205.
3½	700	1	1½	443	131	177.
3½	700	1	2	472	122	158.
3½	700	1	2½	493	115	144.
3½	800	1	1	451	152	244.
3½	800	1	1½	499	139	212.
3½	800	1	2	534	129	188.
3½	800	1	2½	557	122	172.
3½	900	1	1	500	161	285.
3½	900	1	1½	555	147	248.
3½	900	1	2	595	136	221.
3½	900	1	2½	622	128	202.
3½	900	1½	2½	554	122	191.
3½	1000	1	1	549	170	329.
3½	1000	1	1½	611	154	286.
3½	1000	1	2	635	143	255.
3½	1000	1	2½	685	134	233.
3½	1000	1½	2	576	135	238.
3½	1000	1½	2½	610	128	220.
3½	1100	1	1	597	178	374.
3½	1100	1	1½	666	162	325.
3½	1100	1	2	715	149	291.
3½	1100	1½	1½	581	150	296.
3½	1100	1½	2	628	141	270.
3½	1100	1½	2½	665	133	250.
3½	1200	1	1½	721	170	367.
3½	1200	1½	1½	628	157	332.
3½	1200	1½	2	681	147	304.
3½	1200	1½	2½	721	139	282.
3½	1200	2	2	615	140	287.
3½	1200	2	2½	667	131	264.
3½	1300	1	1½	776	177	411.
3½	1300	1½	1½	675	163	370.
3½	1300	1½	2	732	153	339.
3½	1300	2	1½	604	154	346.
3½	1300	2	2	662	145	320.
3½	1300	2	2½	718	136	294.
3½	1400	1	1½	830	184	456.
3½	1400	1½	1½	722	169	410.
3½	1400	2	1½	646	160	383.
3½	1400	2	2	708	151	354.
3½	1400	2	2½	769	141	326.
4	700	1	1	435	149	234.
4	700	1	1½	478	135	199.
4	700	1	2	504	125	174.
4	700	1	2½	523	118	158.
4	800	1	1	490	159	279.
4	800	1	1½	537	144	238.
4	800	1	2	570	133	209.
4	800	1	2½	592	125	189.
4	900	1	1	544	169	327.
4	900	1	1½	598	153	278.
4	900	1	2	636	140	246.
4	900	1	2½	661	132	223.
4	900	1½	2½	590	126	210.
4	1000	1	1	598	178	377.
4	1000	1	1½	659	161	323.
4	1000	1	2	701	148	284.
4	1000	1	2½	730	139	258.
4	1000	1½	2	618	140	263.
4	1000	1½	2½	651	132	242.
4	1100	1	1	651	187	430.
4	1100	1	1½	719	169	368.
4	1100	1	2	766	155	325.
4	1100	1½	1½	627	157	331.
4	1100	1½	2	675	146	300.
4	1100	1½	2½	710	138	276.
4	1100	2	2½	651	130	256.
4	1200	1	1½	779	177	416.
4	1200	1½	1½	678	164	373.
4	1200	1½	2	731	153	336.
4	1200	1½	2½	770	144	311.
4	1200	2	2	653	144	316.
4	1200	2	2½	705	135	283.
4	1300	1	1½	838	185	467.
4	1300	1½	1½	730	170	417.
4	1300	1½	2	787	159	378.
4	1300	2	1½	645	160	384.
4	1300	2	2	703	150	352.
4	1300	2	2½	759	140	321.
4	1400	1	1½	898	192	520.
4	1400	1½	1½	781	177	462.
4	1400	2	1½	689	166	424.
4	1400	2	2	752	156	390.
4	1400	2	2½	813	146	357.
4½	700	1	1½	453	132	204.

Johns-Manville

22 East 40th Street • New York, N.Y. 10016

Sales Offices in Principal Cities

IN 1904 11-68