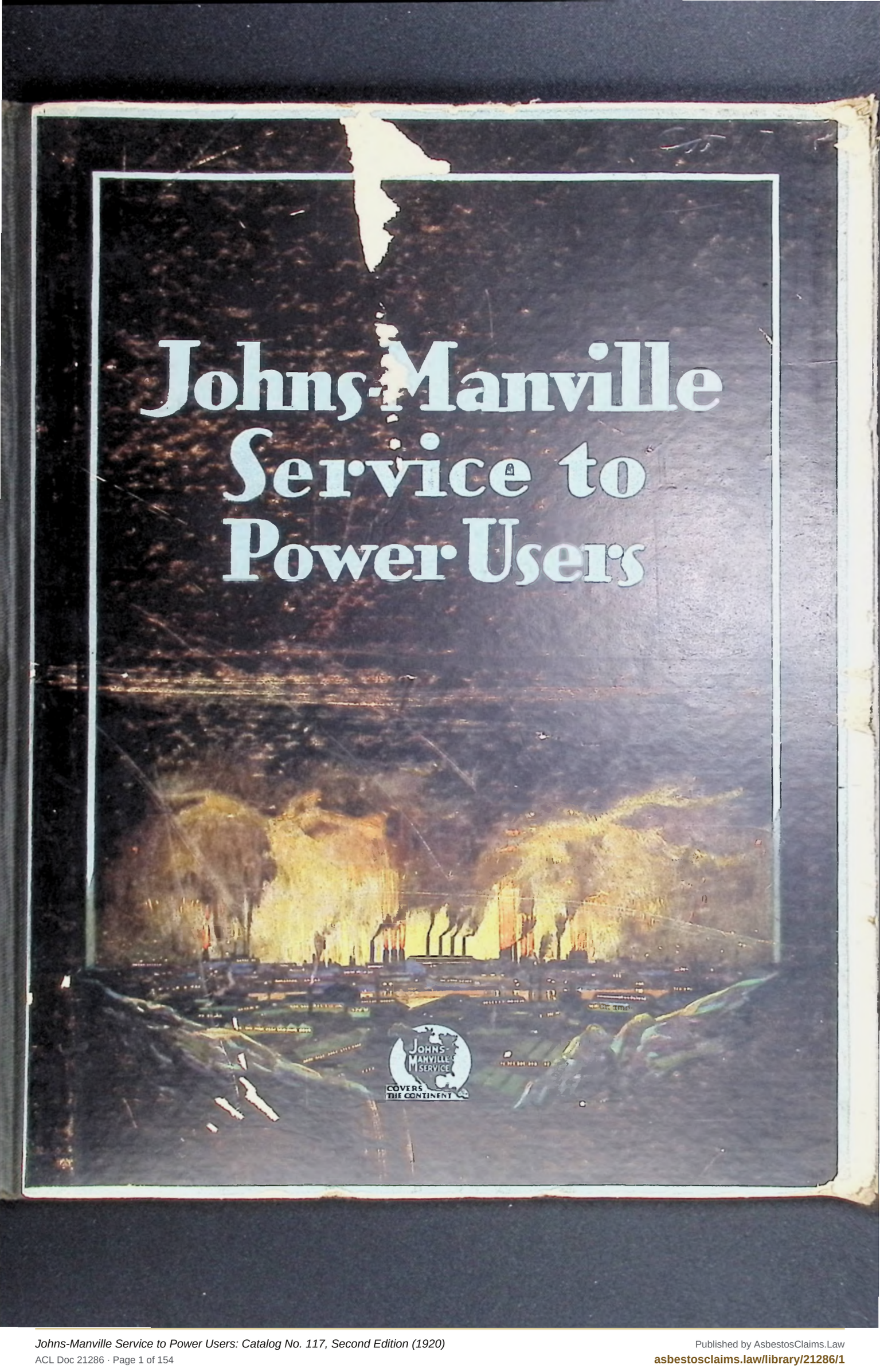
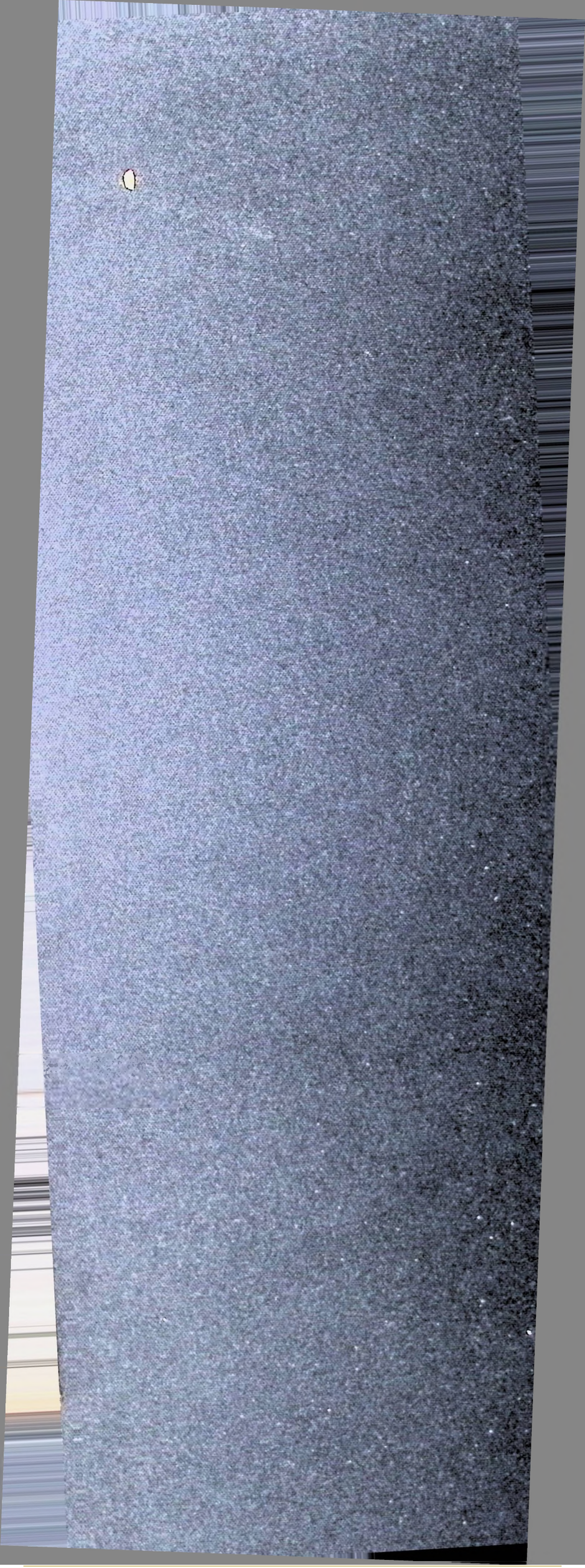
Johns-Manville Service to Power Users



Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/1



Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/2

Johns-Manville Service to Power Users



Catalog No. 117

Second Edition

H. W. Johns-Manville Co.

New York City

Akron	Columbus	Houston	Omaha	San Francisco
Albany	Dallas	Indianapolis	Philadelphia	Seattle
Atlanta	Dayton	Kansas City	Pittsburgh	Stockton
Baltimore	Denver	Los Angeles	Portland	Syracuse
Birmingham	Des Moines	Louisville	Rochester	Tacoma
Boston	Detroit	Memphis	Sacramento	Toledo
Buffalo	Duluth	Milwaukee	Saginaw	Tulsa
Canton	El Paso	Minneapolis	St. Louis	Washington
Chicago	Grand Rapids	Nashville	St. Paul	Wilkes-Barre
Cincinnati	Great Falls	Newark	Salt Lake City	Youngstown
Cleveland	Houghton	New Orleans	San Diego	Havana, Cuba

CANADIAN JOHNS-MANVILLE CO., LIMITED

Hamilton Toronto London Vancouver Montreal Winnipeg Ottawa

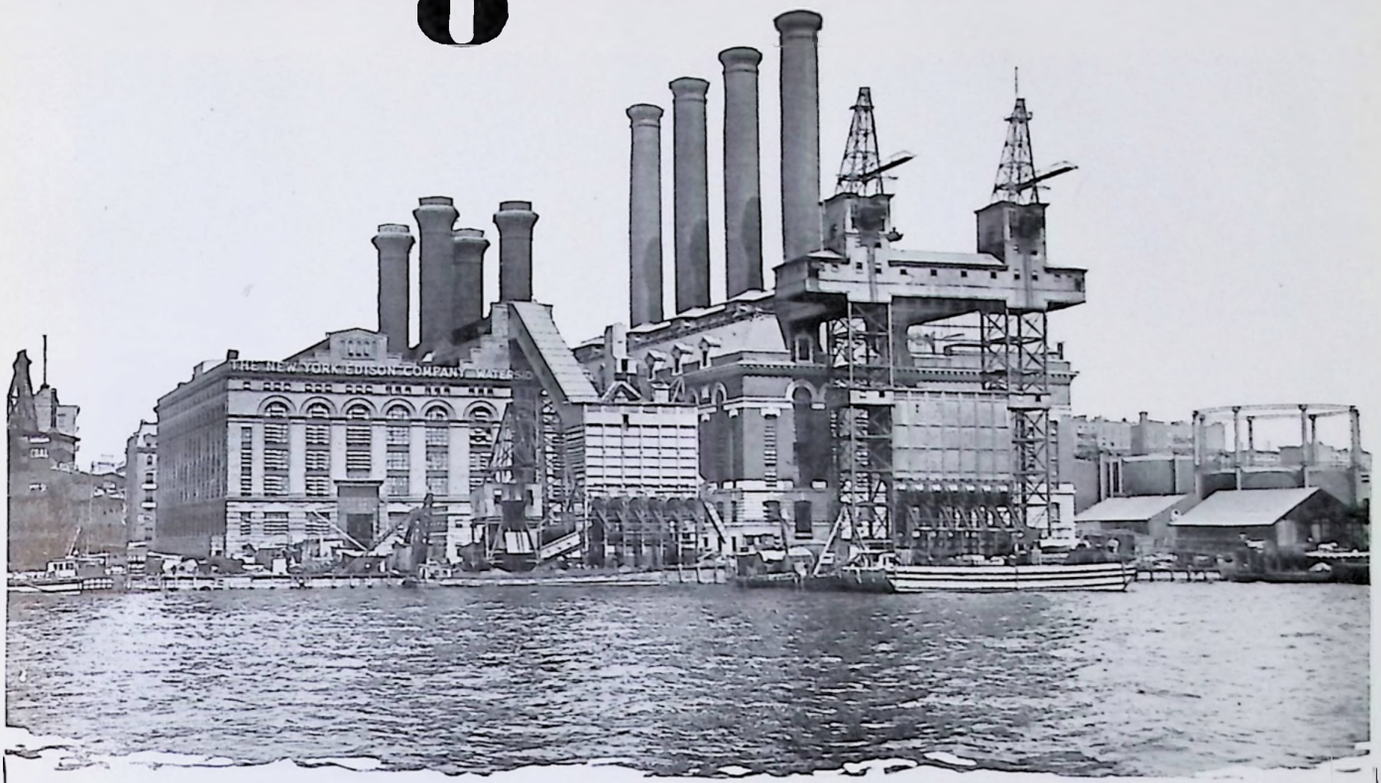
P1-20-5

Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/4

Copyright, 1920
by
H. W. Johns-Manville Co.
New York

Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/5

Cutting Power Costs



BACK of the belching chimneys, behind the throbbing engines that drive the busy plant is the big factor of plant upkeep—maintenance cost.

Johns-Manville Service to power-users has its effect in reducing this expense of plant maintenance. It acts through power conservation right back to the ultimate reduction of your bills for fuel and labor.

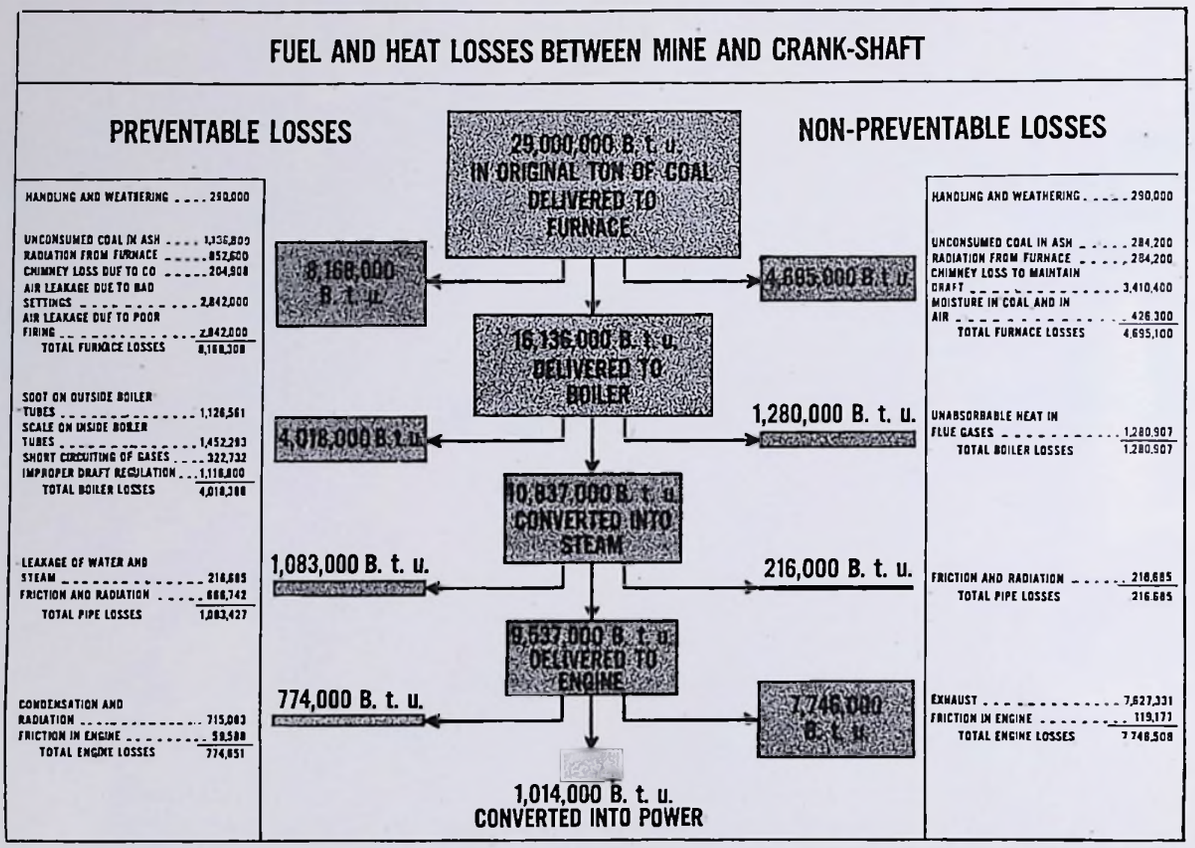
Wasted power means wasted coal. Unnecessary heat lost from bare or improperly insulated surfaces—heat units that are lost in improperly trapped steam lines or the energy that is used up in moving the piston-rod of an improperly packed engine—is just as much wasted as unburned coal that drops through your grate-bars.

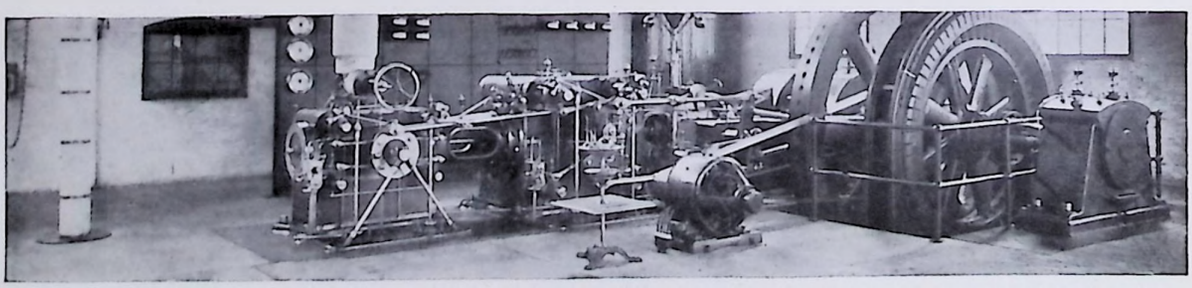
Wasted labor in packing, trap repairing or rebuilding boiler settings that break down on account of excessive heat—means a production loss that counts big on the costs ledger.

Johns-Manville Service embraces a complete line of maintenance materials designed to save heat, friction, wear and labor. The service rendered by each of these products is assured by Johns-Manville Responsibility, a business principle that places the user's satisfaction above all other considerations.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 6 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/6







Where to Cut Power Costs

Just a little over half of the total heat losses in coal are preventable. Of these useless losses, this chart shows that the furnace wastes fifty-eight per cent, the boiler is responsible for twenty-eight per cent, the piping dissipates nearly eight per cent and the engine is charged with five per cent. Bad boiler settings and poor firing are equally responsible for air leakage which is the largest single cause of wasted coal. Are there not suggested in these figures points of worth-while attack? (Reprinted from "Factory.")

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 7 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/7

Points of Worth-While Attack

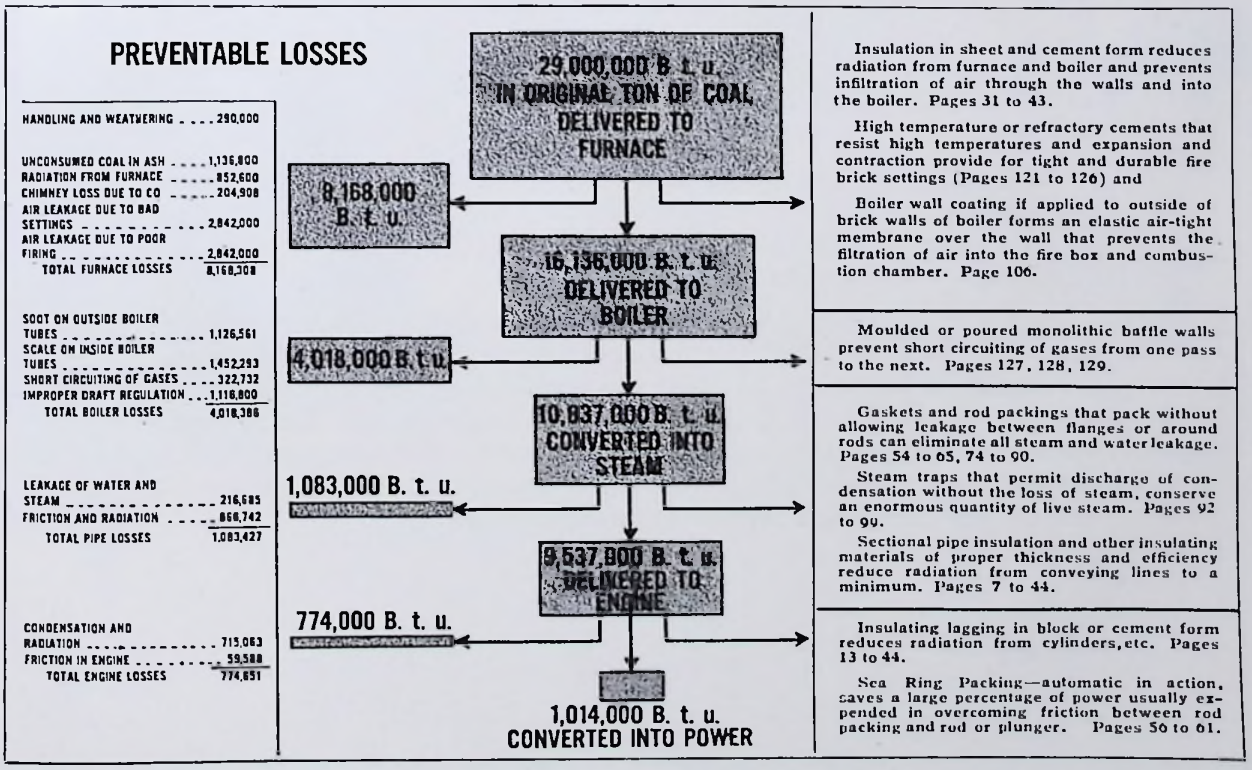
THE opposite page visualizes fuel, heat and power losses—it makes possible a realization of not only how enormous these losses may be, but also where they occur. The chart should be of material assistance in searching for preventable losses.

The following pages of this catalog are presented not only as descriptive matter pertaining to those things manufactured and offered for sale by the Johns-Manville Company, but also to assist in eliminating or at least reducing to a minimum many preventable losses by the proper application of materials and devices built to conserve a maximum of fuel, heat and power.

The cost, durability and adaptability of a material purchased to prevent loss of heat and power are important, but of equal importance is the EFFICIENCY of the material—a comparison of saving effected by a material, with what would be lost if it were not used.

It is surely worth while to compare efficiencies and to select materials that SAVE MOST—for if it is desirable to reduce a loss it is surely advisable to reduce the loss to a minimum, and generally a material or specialty that reduces loss to a minimum is far more economical than a material that saves only a part of the "preventable loss."

The chart below shows where some Johns-Manville proprietary materials may be applied to effect the elimination of preventable losses.



Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 8 of 154
asbestosclaims.law/library/21286/8

More Horsepower from America's Coal Pile

MORE horsepower from America's coal pile is one of the big problems of industry that touches us all. The economy with which coal is burned is as important in regulating the price of life's necessities as the cost of raw material or the price of labor.

"More power delivered per pound of coal" is the aim of every manufacturer as he strives for industrial economy. "More heat delivered per ton of coal" is the aim of every fuel-user, whether in home, church, school or workshop.

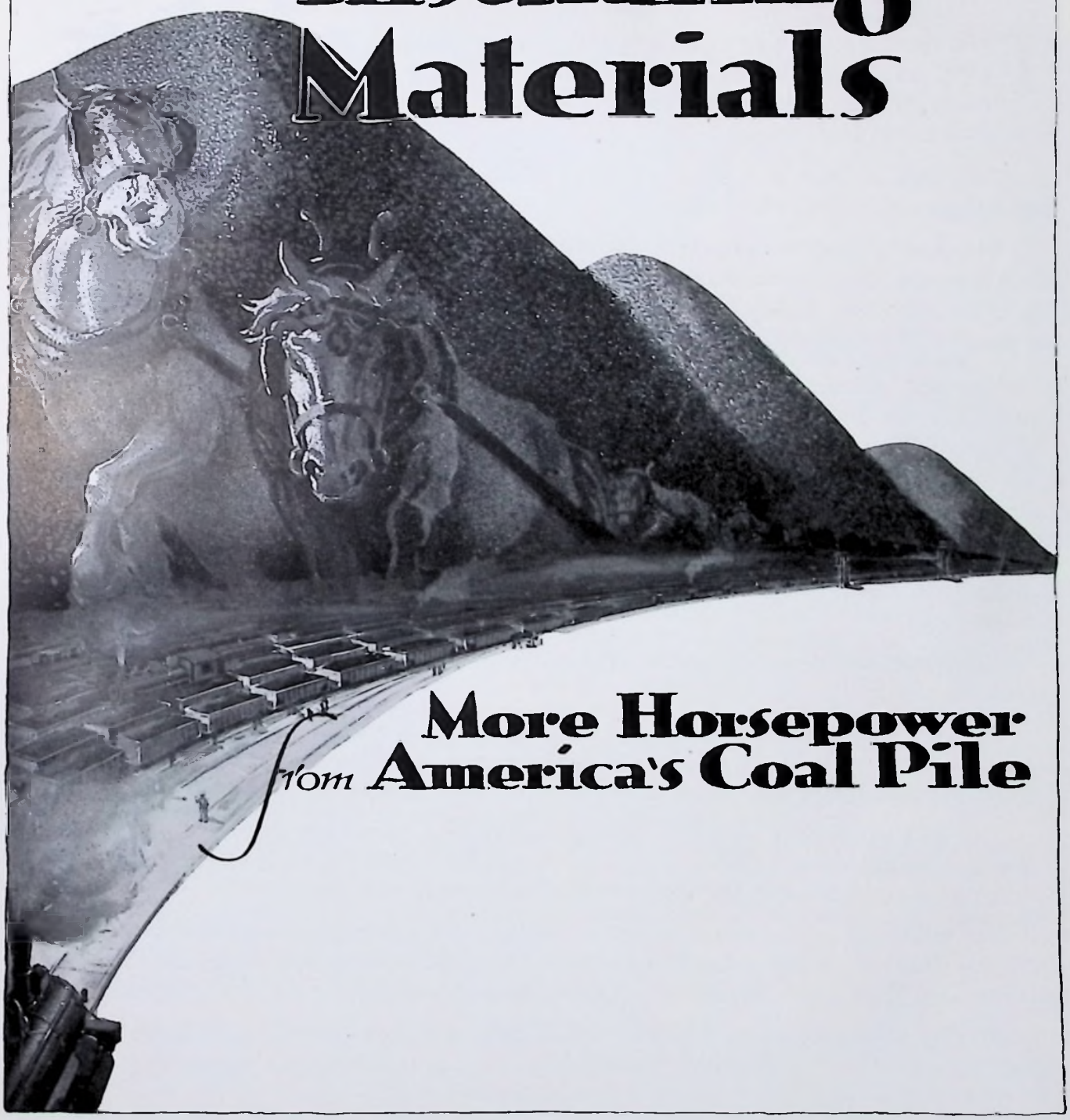
One of the most important results of the development of Asbestos by Johns-Manville has been the saving of heat through insulation. Johns-Manville have developed materials, built on asbestos as a base, that retard the escape of heat from boilers, furnaces, pipes and flues. Johns-Manville Insulation Service, the perfecting of these heat insulations and their application to thousands of America's power plants, is saving power by saving fuel—millions of dollars worth annually; nor does this include countless other installations on the heating systems of homes and buildings generally, where coal is burned for human comfort.

Twenty-five years' specialization, directed by the highest engineering talent, has enabled Johns-Manville to develop and produce insulations of exceptional efficiency and durability under every service condition.

Asbesto-Sponge, for example—a remarkable felt which combines the "dead air-cell" insulation of sponge with the endurance of asbestos—is ranked first in efficiency by independent investigators. Or 85% Magnesia—or Asbestocel, Zero, Anti-Sweat, or Brine and Ammonia Insulations—whatever your needs, you can meet them efficiently with one of the Johns-Manville Insulations described on the following pages.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 9 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/9

Johns-Manville Insulating Materials



More Horsepower from America's Coal Pile

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 10 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/10

Insulation

THE real object of insulation is to prevent the flow of heat to the outside surrounding air from a boiler, apparatus or pipe in which it may be generated, stored or conveyed, or to prevent the flow of heat from the outside to fluids or solids which should be kept cool or at low temperatures.

The unit of heat is a B.t.u. (British Thermal Unit)—just as a gallon is a unit of liquid measure, a foot a unit of linear measure or an ampere a unit of electrical current flow.

The flow of heat from the fluid in a bare or insulated pipe to the outside surrounding air is measured by the number of heat units that flow through the walls of the pipe, or insulation, or both, and is usually expressed in the number of B.t.u. that flow through an area of one square foot in one hour—(B.t.u. per square foot per hour).

The rate of flow through a certain thickness and at a certain difference in temperature determines the conductivity of the material through which the heat flows. A smaller number of heat units flow through a material with a low conductivity than one with a high conductivity.

The relative efficiencies of various insulating materials may be appreciated by comparing their conductivities under similar conditions.

An insulation that would allow no flow of heat through it would be 100 per cent. efficient.

Material that offered no resistance to the flow of heat would have an efficiency of 0 (zero).

The two examples above are the two extremes that do not exist, but the 100 per cent efficient insulation is nearly obtained by the application of any one of several Johns-Manville forms of insulation.

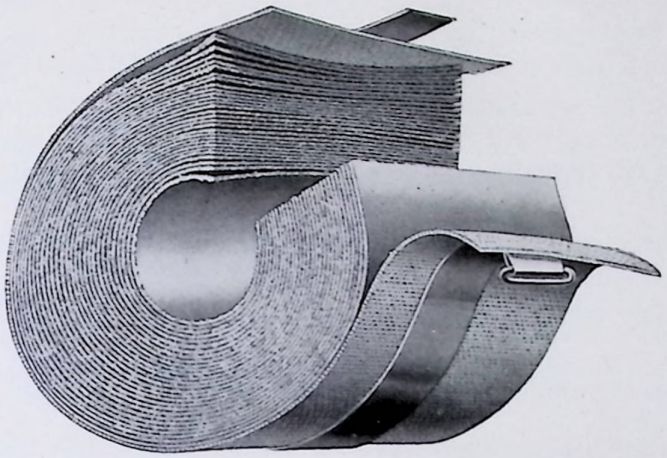
The EFFICIENCY of an insulating material is expressed by a percentage which is the per cent saving which would be effected by insulating a pipe with that material, over what would be lost if the pipe were left bare or uninsulated.

The efficiency per cent is obtained by subtracting the heat loss of the insulated pipe from the heat loss of the uninsulated or bare pipe and dividing the difference by the heat loss from the bare pipe. See How to Use Efficiency Tables on page 132 of Appendix.

On the following pages are tables and technical data pertaining to Johns-Manville Insulations, and on page 137 of Appendix is table showing thickness of steam pipe insulation recommended for various temperatures and pressures.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 11 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/11

Johns-Manville Asbesto-Sponge Felted Sectional Pipe Insulation



The most durable, efficient and adaptable insulation known for insulating pipes conveying steam at any pressure or temperature.

JOHNS-MANVILLE Asbesto-Sponge Felted Insulation is made of layers of thin felt composed of asbestos fibre and particles of finely ground spongy material forming an extremely cellular felt—built up like a book in laminated form, thereby confining a large volume of minute dead air cells in the felt and between the layers.

Johns-Manville Asbesto-Sponge Felted Insulation possesses not only very high initial efficiency as shown on the following pages, but permanent efficiency year after year because of its extremely durable construction.

Because of its construction and unlike insulations of the moulded type, Johns-Manville Asbesto-Sponge Felted is tough, flexible and practically indestructible. Pipe vibration and the general wear and tear to which insulation in factories is subjected will not pulverize Sponge Felted Insulation or break it away from the pipe. Even if subjected to excessive moisture or saturated with water it will dry out and regain its initial efficiency. Whenever necessary it can be removed from the pipes and replaced without injury.

Expansion and contraction of pipes will not wear away or harm the inside of Asbesto-Sponge Felted Insulation. Because of its durability, adaptability and permanent efficiency it provides exceptional economy. Sections are cut entirely through on one side only, which is a distinct advantage from an insulating standpoint.

Johns-Manville Asbesto-Sponge Felted Sectional Pipe Insulation is furnished in thicknesses from ½" to 3", in 3-foot sections with canvas jacket and brass-lacquered bands, to fit standard pipe sizes. Specifications for Johns-Manville Asbesto-Sponge Felted Insulation will be found on page 12.

Also furnished in sheets and blocks for boilers, flues and other large regular surfaces. Sheets 24" x 36", and blocks 6" x 36", in thicknesses from ½" to 4".

For descriptive data on this insulation in sheet and block form, see page 32.

See approximate weights and price list on page 30.

For Insulating Steam Train Pipes of Passenger Equipment.

This insulation, on account of its efficiency and durability, is the best material obtainable for this service. We also furnish Fire-Felt Train Pipe Insulation.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 12 of 154
asbestosclaims.law/library/21286/12

What Insulation Efficiency Means

The efficiency of an insulating material is expressed by a percentage, which is the per cent of heat saved by using the insulation as compared to what would be lost if no insulation were used and the pipe left bare or uninsulated.

The efficiency of all insulations varies according to the size of pipe to which they are applied and according to the difference in temperature between steam in the pipe and air surrounding the pipe, as well as according to thickness of insulation.

Complete information regarding the use of efficiency tables with examples to illustrate will be found on page 132.

For table showing total heat loss from BARE pipes, see page 133.

Efficiencies of Standard Thick Johns-Manville Asbesto-Sponge Felted Sectional Pipe Insulation on Various Sizes of Pipes

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500
	Per Cent Efficiencies									
½	68.5%	71.2%	73.3%	75.5%	77.1%	78.7%	80.4%	81.9%	83.1%	84.5%
¾	71.9	74.3	76.2	78.1	79.6	81.	82.6	83.8	85.	86.2
1	74.3	76.5	78.2	79.9	81.3	82.6	84.	85.2	86.2	87.4
1¼	75.7	77.7	79.5	81.	82.3	83.5	84.9	86.	86.9	88.
1½	77.	79.	80.5	82.	83.2	84.4	85.7	86.7	87.6	88.6
2	78.6	80.4	81.9	83.3	84.4	85.5	86.7	87.6	88.5	89.3
2½	79.8	81.5	82.9	84.3	85.3	86.3	87.5	88.4	89.2	90.3
3	80.6	82.2	83.6	84.9	85.9	86.8	87.9	88.8	89.6	90.3
3½	81.2	82.8	84.1	85.4	86.3	87.3	88.3	89.2	89.9	90.6
4	81.8	83.3	84.5	85.8	86.7	87.6	88.7	89.5	90.2	90.9
4½	82.1	83.6	84.8	86.	87.	87.9	88.9	89.7	90.4	91.1
5	82.3	83.8	85.	86.2	87.1	88.	89.	89.8	90.5	91.2
6	82.7	84.2	85.4	86.5	87.4	88.3	89.3	90.1	90.7	91.4
7	83.	84.5	85.6	86.8	87.6	88.5	89.5	90.2	90.9	91.6
8	83.4	84.8	85.9	87.	87.9	88.7	89.7	90.4	91.1	91.7
9	83.5	84.9	86.	87.2	88.	88.8	89.8	90.5	91.2	91.8
10	83.8	85.1	86.2	87.3	88.2	89.	89.9	90.6	91.3	91.9

Efficiencies of 1½" Thick Johns-Manville Asbesto-Sponge Felted Sectional Pipe Insulation on Various Sizes of Pipe

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
½	70.3%	72.9%	75. %	76.8%	78.4%	80. %	81.5%	82.9%	84.2%	85.2%
¾	73.7	75.9	77.7	79.4	80.9	82.4	83.5	84.9	86.	87.
1	76.1	78.1	79.8	81.3	82.7	84.1	85.1	86.3	87.3	88.1
1¼	77.8	79.7	81.2	82.5	83.8	85.1	86.1	87.2	88.2	89
1½	79.	80.7	82.3	83.5	84.7	86.	86.9	88.	88.8	89.9
2	81.	82.7	84.	85.2	86.2	87.2	88.1	89.1	89.9	90.6
2½	82.1	83.7	85.1	86.1	87.	88.1	88.8	89.8	90.5	91.1
3	83.	84.5	85.7	86.8	87.7	88.7	89.4	90.3	91.	91.6
3½	83.6	85.	86.2	87.2	88.1	89.1	89.8	90.6	91.3	91.9
4	84.2	85.5	86.7	87.7	88.5	89.5	90.1	91.	96.	92.1
4½	84.6	85.9	87.1	88.	88.8	89.8	90.4	91.2	91.8	92.3
5	85.	86.3	87.4	88.3	89.1	90.	90.6	91.4	91.2	92.5
6	85.4	86.7	87.8	88.6	89.4	90.3	90.9	91.7	92.2	92.7
7	85.9	87.1	88.1	89.	89.8	90.6	91.2	91.9	92.5	92.9
8	86.2	87.5	88.4	89.1	90.	90.8	91.4	92.1	92.7	93.1
9	86.4	87.7	88.6	89.3	90.1	90.9	91.5	92.2	92.8	93.2
10	86.6	87.8	88.8	89.6	90.3	91.	91.6	92.3	92.9	93.4

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 13 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/13

Efficiencies of 2" Thick Johns-Manville Asbesto-Sponge Felted Sectional Pipe Insulation on Various Sizes of Pipe

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
½	73.2%	75.6%	77.5%	79.2%	80.7%	82. %	83.5%	84.6%	86.1%	87.4%
¾	76.5	78.6	80.3	81.8	83.1	84.2	85.5	86.5	87.8	88.8
1	78.8	80.7	82.2	83.6	84.8	85.8	87.	87.8	89.	90.
1¼	80.5	82.	83.6	84.9	86.	87.1	88.	88.8	89.8	90.8
1½	81.7	83.4	84.7	85.9	86.9	87.8	88.7	89.5	90.4	91.2
2	83.6	85.1	86.2	87.2	88.1	89.	89.9	90.6	91.4	92.1
2½	84.3	86.1	87.2	88.2	89.	89.7	90.5	91.2	92.	92.7
3	85.6	86.8	87.9	88.8	89.6	90.3	91.1	91.7	92.5	93.2
3½	86.2	87.4	88.4	89.3	90.1	90.8	91.5	92.1	92.8	93.5
4	86.7	87.9	88.8	89.7	90.5	91.1	91.8	92.4	93.1	93.7
4½	87.1	88.3	89.2	90.	90.7	91.3	92.1	92.6	93.3	93.9
5	87.5	88.6	89.5	90.3	91.	91.6	92.3	92.8	93.5	94.1
6	88.	89.1	89.9	90.7	91.3	91.9	92.6	93.1	93.8	94.3
7	88.4	89.4	90.2	91.	91.6	92.2	92.8	93.3	94.	94.5
8	88.6	89.6	90.4	91.2	91.8	92.4	93.	93.4	94.1	94.6
9	88.9	89.9	90.6	91.4	92.	92.5	93.1	93.6	94.2	94.7
10	89.1	90.1	90.8	91.5	92.2	92.7	93.3	93.7	94.3	94.8

Efficiencies of 2½" Thick Johns-Manville Asbesto-Sponge Felted Sectional Pipe Insulation on Various Sizes of Pipe

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
½	75. %	77.3%	78.9%	80.7%	82.1%	83.7%	84.8%	85.9%	87. %	88.%
¾	78.2	80.	81.6	83.2	84.4	85.7	86.7	87.7	88.5	89.3
1	80.5	82.2	83.5	85.	86.	87.2	88.1	89.	89.7	90.4
1¼	82.2	83.8	84.9	86.2	87.2	88.3	89.1	90.	90.6	91.3
1½	83.4	84.9	86.	87.2	88.1	89.1	89.9	90.6	91.2	91.9
2	85.2	86.5	87.5	88.6	89.4	90.3	91.	91.7	92.2	92.8
2½	86.3	87.5	88.4	89.4	90.2	91.	91.7	92.3	92.8	93.3
3	87.1	88.3	89.1	90.1	90.8	91.6	92.2	92.7	93.2	93.7
3½	87.8	88.9	89.7	90.6	91.2	92.	92.6	93.1	93.5	94.
4	88.3	89.3	90.1	90.9	91.6	92.3	92.9	93.4	93.8	94.3
4½	88.7	89.7	90.4	91.2	91.9	92.6	93.1	93.6	94.	94.5
5	89.	90.	90.7	91.5	92.	92.8	93.3	93.8	94.2	94.6
6	89.5	90.4	91.1	91.9	92.	93.1	93.6	94.1	94.5	94.8
7	89.9	90.8	91.4	92.2	92.7	93.4	93.8	94.3	94.7	95.
8	90.1	91.	91.6	92.4	92.9	93.5	94.	94.4	94.8	95.1
9	90.3	91.2	91.8	92.5	93.1	93.7	94.1	94.6	94.9	95.2
10	90.5	91.4	92.	92.7	93.2	93.8	94.2	94.7	95.	95.3

Efficiencies of 3" Thick Johns-Manville Asbesto-Sponge Felted Sectional Pipe Insulation on Various Sizes of Pipe

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
½	76.8%	78.9%	80.6%	82.1%	83.4%	84.6%	85.8%	87. %	88.1%	89.1%
¾	79.7	81.7	83.1	84.5	85.6	86.6	87.6	88.6	89.6	90.5
1	81.9	83.5	84.8	86.1	87.1	88.	88.9	89.8	90.7	91.5
1¼	83.5	85.	86.2	87.3	88.2	89.1	89.9	90.8	91.6	92.3
1½	84.7	86.1	87.2	88.3	89.1	89.9	90.6	91.4	92.2	92.8
2	86.5	87.7	88.7	89.6	90.3	91.	91.7	92.4	93.1	93.7
2½	87.5	88.7	89.6	90.5	91.1	91.7	92.4	93.	93.5	94.2
3	88.4	89.5	90.3	91.2	91.7	92.3	92.9	93.5	94.1	94.6
3½	89.	90.	90.8	91.6	92.1	92.7	93.3	93.8	94.4	94.8
4	89.5	90.5	91.2	92.	92.5	93.	93.6	94.1	94.6	95.1
4½	89.9	90.8	91.5	92.2	92.8	93.3	93.8	94.3	94.8	95.2
5	90.2	91.1	91.8	92.5	93.	93.5	94.	94.5	95.	95.4
6	90.7	91.5	92.2	92.9	93.3	93.8	94.3	94.8	95.2	95.6
7	91.1	91.9	92.5	93.2	93.6	94.1	94.5	95.	95.4	95.8
8	91.3	92.1	92.7	93.4	93.8	94.2	94.7	95.1	95.5	95.9
9	91.5	92.3	92.9	93.5	93.9	94.4	94.8	95.2	95.6	96.
10	91.7	92.5	93.	93.6	94.	94.5	94.9	95.3	95.7	96.1

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 14 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/14

Standard Specifications for Insulating Steam Pipes with Johns-Manville Asbesto-Sponge Felted Sectional Insulation

ALL steam piping shall be insulated with Johns-Manville Asbesto-Sponge Felted Sectional Insulation of proper size and thickness. (See note "A.")

Have the ends and edges of all insulation butt tightly together, and for high temperatures or super-heated steam use no canvas or cotton sheeting around section, except that on outside section applied last, and see that none of this is allowed to work into joints of the insulation.

If job is to be re-canvased, use no cotton sheeting or canvas underneath the canvas that is sewed on and use asbestos paper underneath the sewed-on canvas.

Make every joint tight as possible.

Fasten each section with copperized staples and rings of No. 18 or No. 19 wire, wrapping same around insulation and twisting ends together.

After first layer is applied fill and point up all joints with insulating cement.

Apply each succeeding layer in same manner, breaking or staggering joints.

Where pipe fittings—valves, ells, tees, etc.,—are encountered, leave a space of about three inches, or enough to allow flange bolt to be withdrawn, between end of sectional insulation and face of fitting. Seal the end of sectional insulation with insulating cement and finish cement with a bevel or taper from outside of insulation to surface of pipe.

Insulate all flanges, fittings, etc., separately and use same care in eliminating joints or open spaces.

All fittings and valves shall be insulated with Johns-Manville Cement Felting, to be applied to a thickness equal to the adjoining pipe insulation.

All flanges shall be insulated by Method A or B, depending upon whether flange insulation is to be removable and replaceable, or non-replaceable.

METHOD "A"

Use suitable size and length of Johns-Manville Asbesto-Sponge Felted Sectional Insulation to completely encircle flange and overlap the adjoining pipe insulation at least two inches (2″) on each side of the flange. Secure this flange insulation with wire, and fill space between pipe and flange insulation with Johns-Manville Cement Felting.

METHOD "B"

First prime flange surface with a thin coat of Johns-Manville Cement Felting, applied so as to leave a rough surface. When dry, follow with successive one-half inch (½″) coats of Johns-Manville Cement Felting, until a thickness equal to that of the pipe insulation is obtained.

Each coat of this cement should be allowed to dry before the next coat is applied, and each coat should have a rough surface, except the final coat, which should be trowelled down to a smooth finish.

All of the above insulation, including fittings, valves and flanges, shall be finally finished and additionally protected with 8-ounce canvas, neatly sewed on, over asbestos paper, and this canvas painted with fireproof paint, or lead and oil paint, of the color desired. This extra canvas cover to be placed over the canvas jacket furnished with the insulation. (When re-canvasing is not desired or considered unnecessary, see note "B.")

If piping is located out-of-doors and exposed to the weather, the additional protection of 8-ounce canvas and paint may be omitted and in its place the insulation shall be protected with a Johns-Manville Asbestos Weather-proof Pipe Insulation Jacket secured with copper wire, No. 18 gauge, wound spirally at three-inch (3″) centers, and this spiral winding additionally secured with rings formed of No. 18 copper wire wound once around the jacket and ends twisted tightly together. These wire rings to be placed on four inch (4″) centers. The jacket to lap at least three inches (3″) in all directions, and all horizontal laps to be located on the side of the insulation and to look downward in order to shed all water from the surface. (See note "C.")

NOTE "A"—Johns-Manville maintains an engineering department at each of its branches, which will on request recommend proper thickness for various pressures and temperatures.

NOTE "B"—If insulation is not to be re-canvased, lacquered bands furnished with the insulation are to be applied, at 18-inch intervals, on all sectional insulation.

NOTE "C"—When extremely low temperatures are encountered out-of-doors, special recommendations will be given by any of our Branch Engineering Departments.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 15 of 154
asbestosclaims.law/library/21286/15

A Few Prominent Users of Johns-Manville Asbesto-Sponge Felted Sectional Pipe Insulation

Canadian

Dominion Gov't. Custom House, Toronto, Ont.
Parliament Bldgs., Toronto, Ont.
Dominion Bank Bldg., Toronto, Ont.
Royal Bank Bldg., Toronto, Ont.
Canadian Pacific Rwy. Office Bldg., Toronto, Ont.
Regina Power House, Regina, Sask.
Winnipeg Electric Rwy. Power House, Winnipeg, Man.
Canadian Explosives, Ltd., Montreal, Que.
Pacific Mills, Ltd., Ocean Falls, B. C.

New England States

Bridgeport Brass Co., Bridgeport, Conn.
Stanley Works, New Britain, Conn.
Scoville Mfg. Co., Waterbury, Conn.
American Brass Co., Waterbury, Conn.
J. E. Henry & Sons Co., Lincoln, N. H.
Fiberloid Co., Indian Orchard, Mass.
W. H. McElwain Co., Manchester, N. H.
Eastern Electric Chemical Co., South Brewster, Me.
University of Maine, Orono, Me.

Middle Atlantic States

Wilmington Steel Co., Wilmington, Del.
Baltimore Copper Smelting & Refining Co., Baltimore, Md.
Elk Tanning Co., New York City, N. Y.
Vacuum Oil Co., New York City, N. Y.
American Can Co., New York City, N. Y.
New York & Penn. Co., New York City, N. Y.
Borden's Condensed Milk Co., New York City, N. Y.
International Paper Co., New York City, N. Y.
Mexican Petroleum Co., New York City, N. Y.
British-American Chemical Co., New York City, N. Y.
Remington Arms & Ammunition Co., Ilion, N. Y.
Calco Chemical Co., Bound Brook, N. J.
United Piece Dye Works, Lodi, N. J.
New Jersey State Home for Girls, Trenton, N. J.
Carnegie Steel Co., Bessemer, Pa.
Berwind-White Coal Mining Co., Philadelphia, Pa.
T. A. Harris Co., Philadelphia, Pa.
Upper Union Mill, Pittsburgh, Pa.
Crucible Steel Co., Pittsburgh, Pa.
Spang, Chalfant Co., Pittsburgh, Pa.
Diamond Alkali Co., Pittsburgh, Pa.
Colonial Steel Co., Pittsburgh, Pa.

Southern States

Swift & Co., Andalusia, Ala.
Savannah River Lumber Co., Savannah, Ga.
West Point Mfg. Co., West Point, Ga.
Pensacola Water Works, Pensacola, Fla.
Hattiesburg Traction Co., Hattiesburg, Miss.
Meridian Lt. & Traction Co., Meridian, Miss.
R. J. Reynolds Tobacco Co., Winston-Salem, N. C.
Richmond Cedar Works, Norfolk, Va.
Eastern State Hospital, Williamsburg, Va.

Central States

Illinois Steel Co., Chicago, Ill.
Commonwealth Edison Co., Chicago, Ill.
Armour & Co., Chicago, Ill.
International Harvester Corp., Chicago, Ill.
Union Stock Yards & Transit Co., Chicago, Ill.
Sherwin-Williams Co., Kensington, Ill.
University of Illinois, Urbana, Ill.
Van Camp Packing Co., Indianapolis, Ind.
Merchants Heat & Light Co., Indianapolis, Ind.
Inland Steel Co., Chicago, Ill., and Indiana Harbor, Ind.
Terre Haute Paper Co., Terre Haute, Ind.
Detroit Edison Co., Detroit, Mich.
Dow Chemical Co., Midland, Mich.
Champion Copper Co., Houghton, Mich.
Firestone Tire & Rubber Co., Akron, O.
United Alloy Steel Co., Canton, O.
American Steel & Wire Co., Cleveland, O.
Cleveland Electric Ill. Co., Cleveland, O.
Grasselli Chemical Co., Cleveland, O.
Swift & Co., Cleveland O.
Youngstown Sheet & Tube Co., Youngstown, O.
National Tube Works, Benwood, W. Va.
American Sheet & Tin Plate Co., Wheeling, W. Va.
Goodman Lumber Co., Goodman, Wis.
Allis-Chalmers Co., West Allis, Wis.
Wausau Sulphite Fibre Co., Mosinee, Wis.

Southwestern States

Texas Co., Port Arthur, Tex.
Hammond Packing Co., St. Joseph, Mo.
Swift & Co., St. Joseph, Mo.
Terminal Oil Mill, New Orleans, La.
Missouri Pacific Railroad Co., St. Louis, Mo.
Tidal Gasoline Co., Drumright, Okla.
Cosden & Co., West Tulsa, Okla.
Chino Copper Co., Hurley, N. M.

Northwestern States

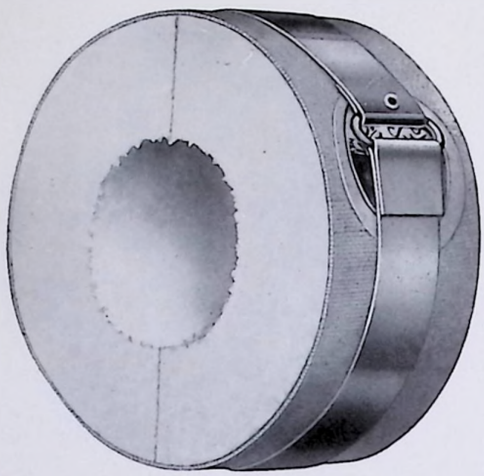
Rutledge Timber Co., Coeur d'Alene, Idaho.
Blackwell Lumber Co., Fernwood, Idaho.
Armour & Co., Omaha, Neb.
Anaconda Copper Mining Co., Butte, Mont.
Montana Power Co., Butte, Mont.

Pacific States

Cal. Hawaiian Sugar Co., Crockett, Cal.
Union Lumber Co., Fort Braff, Cal.
G. W. Electro-Chemical Co., Pittsburgh, Cal.
Libby, McNeill & Libby, San Francisco, Cal.
Standard Lumber Co., Sonora, Cal.
Pinal Dome Oil Co., Santa Maria, Cal.
Ventura Refining Co., Ventura, Cal.
Booth-Kelly Lumber Co., Eugene, Ore.
Weyerhaeuser Lumber Co., Everett, Wash.
Onalaska Lumber Co., Onalaska, Wash.
Seattle Cedar Lumber Mfg. Co., Seattle, Wash.
Canal Lumber Co., Seattle, Wash.
Spokane Heat, Light and Power Co., Spokane, Wash.
St. Paul & Tacoma Lumber Co., Tacoma, Wash.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 16 of 154
asbestosclaims.law/library/21286/16

Johns-Manville 85% Magnesia Sectional Pipe Insulation



For the insulation of pipes conveying steam.

JOHNS-MANVILLE 85% Magnesia Pipe Insulation combines the high non-conducting qualities of carbonate of magnesia and asbestos, affording a light, efficient insulation. Under actual service conditions, Johns-Manville 85% Magnesia has proven itself to be the most durable and efficient insulation of the moulded type. Our manufacturing process produces an 85% Magnesia with a maximum number of voids or minute dead-air cells which increase its natural resistance to heat transmission, reduce its weight, and add greatly to its mechanical strength.

The efficiencies of Johns-Manville 85% Magnesia are given on the opposite page.

Johns-Manville 85% Magnesia Sectional Pipe Insulation is made in various thicknesses from standard (approximately 1″ thick) to 3″ thick, in 3-foot sections with canvas jacket and brass-lacquered bands, to fit standard pipe sizes up to and including 12″ in diameter. For larger pipes, curved segments or blocks are supplied.

Also furnished in blocks for covering boilers, boiler flues and other large regular surfaces. Blocks 3″ x 18″ or 6″ x 36″, in thicknesses from ½″ to 4″.

Specifications for Johns-Manville 85% Magnesia Insulation will be found on page 17.

For descriptive data on this insulation in sheet and block form, see page 33.

See approximate weights and price list on page 30.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 17 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/17

What Insulation Efficiency Means

The efficiency of an insulating material is expressed by a percentage, which is the per cent of heat saved by using the insulation as compared to what would be lost if no insulation were used and the pipe left bare or uninsulated.

The efficiency of all insulations varies according to the size of pipe to which they are applied and according to the difference in temperature between steam in the pipe and air surrounding the pipe, as well as according to thickness of insulation.

Complete information regarding the use of efficiency tables with examples to illustrate will be found on page 132.

For table showing total heat loss from BARE pipes, see page 133.

Efficiencies of Standard Thick Johns-Manville 85% Magnesia Sectional Pipe Insulation on Various Sizes of Pipes

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
½	58.1%	61.7%	64.8%	67.9%	70.5%	72.7%	74.9%	76.8%	78.7%	80.6%
¾	62.6	65.8	68.6	71.3	73.7	75.7	77.7	79.3	81.1	82.7
1	65.8	68.7	71.2	73.7	75.9	77.7	79.5	81.1	82.6	84.
1¼	67.7	70.3	72.9	75.1	77.2	78.9	80.6	82.1	83.5	85.
1½	69.6	72.1	74.3	76.4	78.3	80.	81.7	83.	84.4	85.7
2	74.3	76.7	78.6	80.5	82.1	83.3	84.5	85.7	87.	88.2
2½	75.8	78.	79.8	81.6	82.9	84.2	85.5	86.7	87.9	88.9
3	76.7	78.8	80.6	82.3	83.6	84.8	86.	87.1	88.2	89.3
3½	77.4	79.5	81.2	82.9	84.2	85.4	86.5	87.6	88.7	
4	80.4	81.7	83.1	84.5	85.8	86.9	88.1	89.1	90.	90.8
4½	80.7	82.	83.5	84.8	86.	87.1	88.3	89.3	90.1	91.
5	81.	82.3	83.7	85.	86.2	87.3	88.4	89.4	90.3	91.2
6	81.4	82.7	84.1	85.4	86.4	87.6	88.7	89.7	90.5	91.3
7	82.	83.4	84.7	86.	87.1	88.2	89.2	90.1	91.	91.8
8	82.3	83.7	85.1	86.2	87.3	88.4	89.4	90.2	91.1	91.9
9	82.5	84.	85.2	86.4	87.5	88.5	89.5	90.3	91.2	92.
10	82.8	84.2	85.4	86.5	87.6	88.7	89.6	90.4	91.3	92.1

Efficiencies of 1½" Thick Johns-Manville 85% Magnesia Sectional Pipe Insulation on Various Sizes of Pipes

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
½	66.4%	69.4%	71.8%	74.2%	76.2%	78.1%	80. %	81.7%	83.5%	85.2%
¾	70.3	72.8	74.9	77.1	79.	80.6	82.2	83.8	85.4	87.
1	73.	75.3	77.3	79.2	81.	82.5	84.	85.3	86.7	88.1
1¼	74.9	77.1	78.9	80.6	82.2	83.6	85.	86.3	87.6	89.
1½	76.3	78.2	80.	81.7	83.2	84.6	85.9	87.2	88.5	89.9
2	78.5	80.5	82.	83.6	84.8	85.9	87.1	88.3	89.5	90.6
2½	79.8	81.6	83.2	84.6	85.7	86.9	88.	89.1	90.1	91.1
3	80.8	82.5	83.9	85.3	86.5	87.6	88.7	89.6	90.6	91.6
3½	81.5	83.	84.4	85.8	86.9	88.	89.	90.	91.	91.9
4	82.1	83.6	85.	86.3	87.3	88.3	89.3	90.3	91.3	92.1
4½	82.6	84.1	85.4	86.7	87.7	88.7	89.7	90.6	91.5	92.3
5	83.	84.5	85.8	87.	88.	89.	90.	90.8	91.7	92.5
6	83.5	85.	86.2	87.3	88.3	89.3	90.2	91.1	91.9	92.7
7	84.1	85.4	86.6	87.8	88.8	89.7	90.5	91.3	92.1	92.9
8	84.4	85.8	86.9	87.9	88.9	89.9	90.8	91.5	92.4	93.1
9	84.6	86.	87.1	88.1	89.1	90.	90.9	91.7	92.5	93.2
10	84.9	86.2	87.3	88.3	89.2	90.1	91.	91.8	92.6	93.4

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 18 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/18

Efficiencies of 2" Thick Johns-Manville 85% Magnesia Sectional Pipe Insulation on Various Sizes of Pipe

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
¼	69.4%	72.9%	75.2%	77.1%	79. %	80.7%	82.3%	84. %	85.3%	86.8%
¾	73.2	76.	78.3	80.	81.6	83.1	84.5	86.	87.1	88.2
1	75.8	78.4	80.4	82.	83.4	84.8	86.1	87.3	88.3	89.5
1¼	77.8	79.8	82.	83.4	84.7	86.	87.2	88.4	89.2	90.2
1½	79.1	81.4	83.2	84.5	85.7	86.9	87.9	89.1	89.8	90.8
2	81.3	83.3	84.8	85.9	87.	88.2	89.2	90.2	90.9	91.7
2½	82.1	84.4	85.9	87.	88.	89.	89.8	90.8	91.5	92.3
3	83.6	85.2	86.7	87.7	88.7	89.6	90.5	91.4	92.	92.9
3½	84.3	86.	87.2	88.2	89.2	90.2	90.9	91.8	92.4	93.2
4	84.8	86.4	87.8	88.7	89.6	90.5	91.2	92.1	92.7	93.4
4½	85.3	86.9	88.1	89.	89.9	90.7	91.5	92.3	92.9	93.6
5	85.7	87.2	88.4	89.3	90.2	91.	91.8	92.5	93.1	93.8
6	86.3	87.8	88.9	89.8	90.5	91.3	92.1	92.8	93.4	94.
7	86.8	88.1	89.2	90.1	90.8	91.6	92.3	93.	93.6	94.2
8	87.	88.4	89.4	90.3	91.1	91.8	92.5	93.1	93.7	94.3
9	87.3	88.7	89.7	90.5	91.3	92.	92.6	93.3	93.9	94.4
10	87.6	88.9	89.9	90.7	91.5	92.2	92.8	93.4	94.	94.5

Efficiencies of 2½" Thick Johns-Manville 85% Magnesia Sectional Pipe Insulation on Various Sizes of Pipe

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500
	Per Cent Efficiencies									
¼	71.7%	74.6%	76.6%	78.4%	80.3%	82.1%	83.6%	84.9%	86.3%	87.7
¾	75.4	77.6	79.6	81.2	82.8	84.3	85.6	86.8	87.9	89.1
1	78.	80.1	81.7	83.2	84 6	85.9	87.1	88.2	89.2	90.2
1¼	79.9	81.9	83.2	84.5	85.9	87.1	88.2	89.3	90.1	91.1
1½	81.2	83.1	84.5	85.7	86.9	88.	89.1	89.9	90.8	91.7
2	83.3	84.9	86.1	87.2	88.3	89.3	90.3	90.	91.8	92.6
2½	84.5	86.	87.1	88.1	89.1	90.1	91.	91.8	92.5	93.2
3	85.4	86.9	87.9	88.9	89.9	90.8	91.6	92.2	92.9	93.6
3½	86.2	87.6	88.6	89.5	90.3	91.2	92.	92.6	93.2	93.9
4	86.8	88.	89.	89.8	90.7	91.6	92.3	92.9	93.5	94.2
4½	87.2	88.5	89.3	90.2	91.1	91.9	92.5	93.2	93.7	94.4
5	87.6	88.8	89.7	90.5	91.3	92.1	92.8	93.4	93.9	94.5
6	88.1	89.2	90.1	90.9	91.7	92.4	93.1	93.7	94.2	94.7
7	88.6	89.7	90.5	91.3	92.	92.6	93.3	93.9	94.4	94.9
8	88.8	89.9	90.7	91.5	92.2	92.8	93.5	94.	94.5	95.
9	89.	90.1	90.9	91.6	92.4	93.1	93.6	94.1	94.6	95.1
10	89.3	90.4	91.1	91.8	92.5	93.2	93.7	94.2	94.7	95.2

Efficiencies of 3" Thick Johns-Manville 85% Magnesia Sectional Pipe Insulation on Various Sizes of Pipe

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
¼	73.7%	76.3%	78.5%	80.2%	81.7%	83.4%	84.8%	86.1%	87.3%	88.4%
¾	77.	79.4	81.2	82.8	84.2	85.5	86.7	87.8	88.9	89.9
1	79.5	81.4	83.1	84.6	85.8	87.	88.1	89.1	90.	90.9
1¼	81.3	83.1	84.7	85.9	87.	88.2	89.2	90.1	91.	91.8
1½	82.8	84.4	85.8	87.1	88.	89.1	89.9	90.8	91.7	92.3
2	84.7	86.2	87.5	88.5	89.3	90.2	91.1	91.9	92.6	93.3
2½	85.8	87.3	88.5	89.5	90.2	91.	91.8	92.5	93.1	93.8
3	86.8	88.2	89.2	90.2	90.9	91.7	92.4	93.	93.7	94.2
3½	87.5	88.8	89.8	90.7	91.4	92.1	92.8	93.4	94.	94.5
4	88.1	89.3	90.2	91.1	91.7	92.4	93.1	93.7	94.2	94.8
4½	88.5	89.7	90.6	91.4	92.1	92.8	93.4	93.9	94.4	94.9
5	88.9	90.	90.9	91.7	92.3	93.	93.6	94.1	94.6	95.1
6	89.5	90.4	91.3	92.1	92.7	93.3	93.9	94.4	94.9	95.3
7	89.9	90.9	91.7	92.5	93.1	93.6	94.1	94.6	95.1	95.5
8	90.1	91.1	91.9	92.7	93.2	93.7	94.3	94.8	95.2	95.6
9	90.4	91.3	92.1	92.8	93.3	93.9	94.4	94.9	95.3	95.7
10	90.6	91.5	92.2	92.9	93.4	94.	94.5	95.	95.4	95.8

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 19 of 154
asbestosclaims.law/library/21286/19

Standard Specifications for Insulating Steam Pipes with Johns-Manville 85% Magnesia Sectional Insulation

ALL steam piping shall be insulated with Johns-Manville 85% Magnesia Sectional Insulation of proper size and thickness. (See note "A" below.)

All fittings and valves shall be insulated with Johns-Manville Cement Feltings, to be applied to a thickness equal to the adjoining pipe insulation.

All flanges shall be insulated by method "A" or "B," depending upon whether flange insulation is to be removable and replaceable or non-replaceable.

METHOD "A"

Use No. 19 half-inch mesh galvanized iron wire netting for forming frame for the removable and replaceable flange.

This wire meshing should be cut into two pieces of such a size that each piece will encircle one-half (½) the flange, and with the ends turned in towards the pipe so that it will meet and come in contact with the insulation on the pipe.

Attach to this wire mesh frame Johns-Manville 85% Magnesia blocks or sectional insulation of proper size and length and wire in place with wire lacing.

Apply on the ends of this removable frame one and one-half inch and over the blocks one-half inch finish of Johns-Manville Cement Felting.

METHOD "B"

First prime flange surface with a thin coat of Johns-Manville Cement Felting, applied so as to leave a rough surface. When dry follow with successive one-half inch (½") coats of Johns-Manville Cement Felting, until a thickness equal to that of the pipe insulation is obtained.

Each coat of this cement should be allowed to dry before next coat is applied, and each coat should have a rough surface, except the final coat, which should be trowelled down to a smooth finish.

All of the above insulation, including fittings, valves and flanges, shall be finally finished and additionally protected with 8-ounce canvas, neatly sewed on, over rosin-sized paper, and this canvas painted either with fireproof paint, or lead and oil paint, of the color desired. This extra canvas covering to be placed over the canvas jacket furnished with this insulation. (When re-canvasing is not desired or considered unnecessary, see note "B.")

If piping is located out-of-doors and exposed to the weather, the additional protection of 8-ounce canvas and paint may be omitted and in its place the insulation shall be protected with a Johns-Manville Asbestos Weather-proof Pipe Insulation Jacket secured with copper wire, No. 18 gauge, wound spirally at three-inch (3") centers, and this spiral winding additionally secured with rings formed of No. 18 copper wire wound once around the jacket and ends twisted tightly together. These wire rings to be placed on four-inch (4") centers. The jacket to lap at least three inches (3") in all directions, and all horizontal laps to be located on the side of the insulation and to look downward in order to shed all water from the surface. (See note "C.")

NOTE "A"—Johns-Manville maintains an engineering department at each of its branches, which will, on request, recommend proper thickness for various pressures and temperatures.

NOTE "B"—If insulation is not to be re-canvased, lacquered bands furnished with the insulation are to be applied, at 18" intervals, on all sectional insulation.

NOTE "C"—When extremely low temperatures are encountered out-of-doors, special recommendations will be given by any of our Branch Engineering Departments.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 20 of 154
asbestosclaims.law/library/21286/20

A Few Prominent Users of Johns-Manville 85% Magnesia Sectional Pipe Insulation

Canadian

Yarrows, Ltd., Victoria, B. C.
Steel Co. of Canada, Ltd., Hamilton, Ont.
Dominion Cartridge Co., Brownsburg, Que.
John Coughlin & Sons, Vancouver, B. C.

New England States

Remington Arms U. M. C. C., Bridgeport, Conn.
Bigelow-Hartford Carpet Corp., Thompsonville, Conn.
Great Northern Paper Co., Millinocket and Madison, Me.
American Woolen Co., Boston, Mass.
Boston Elev. Ry. Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Fore River Shipbuilding Co., Quincy, Mass.
Brown Co., Berlin, N. H.
Sayles Finishing Plants, Saylesville, R. I.
General Fire Extinguisher Co., Providence, R. I.
Fisk Rubber Co., Chicopee Falls, Mass.

Middle Atlantic States

Standard Oil Co., Baltimore, Md.
Isabell Furnaces, Pittsburgh, Pa.
Lindsay-McCutcheon, Pittsburgh, Pa.
H. J. Heinz Co., Pittsburgh, Pa.
Atlantic Refining Co., Pittsburgh, Pa.
Pennsylvania Works, Pittsburgh, Pa.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
McKeesport Tin Plate Co., McKeesport, Pa.
National Works, McKeesport, Pa.
Bethlehem Steel Works, South Bethlehem, Pa.
New York Shipbuilding Co., Camden, N. J.
Henry R. Worthington, Harrison, N. J.
John A. Roebling's Sons Co., Trenton, N. J.
Baker, Smith & Co., New York City, N. Y.
Westinghouse, Church, Kerr Co., New York City, N. Y.
Thompson-Starrett Co., New York City, N. Y.
Standard Oil Co. of N. J., New York City, N. Y.
International Paper Co., New York City, N. Y.
Tide Water Oil Co., New York City, N. Y.
Semet-Solvay Co., Syracuse, N. Y.
Champlain Silk Co., Whitehall, N. Y.

Southern States

General Fire Extinguisher Co., Atlanta, Ga.
General Fire Extinguisher Co., Charlotte, N. C.

Central States

Crane Co., Chicago, Ill.
American Can Co., Chicago, Ill.
International Harvester Co., Chicago, Ill.
Illinois Steel Co., Chicago, Ill.
Swift & Co., Chicago, Ill.
Cudahy Packing Co., Chicago, Ill.
Citizens' Gas Co., Indianapolis, Ind.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Pere Marquette Co., Detroit, Mich.
Ford Motor Co., Detroit, Mich.
Detroit Edison Co., Detroit, Mich.
B. F. Goodrich Co., Akron, O.
Babcock & Wilcox Co., Barberton, O.
General Fire Extinguisher Co., Warren, O.
Youngstown Sheet & Tube Co., Youngstown, O.
Marion Extract Co., Chattanooga, Tenn.

Southwestern States

Calumet & Arizona Mining Co., Calumet, Ariz.
Kansas Gas & Elec. Co., Wichita, Kan.
Johnson Iron Works, New Orleans, La.
Anheuser-Busch Brewing Co., St. Louis, Mo.
American Car & Foundry Co., St. Louis, Mo.
Empire Refining Co., Bartlesville, Okla.
Armour & Co., Ft. Worth, Tex.
Gulf Pipe Line Co., Houston, Tex.

Northwestern States

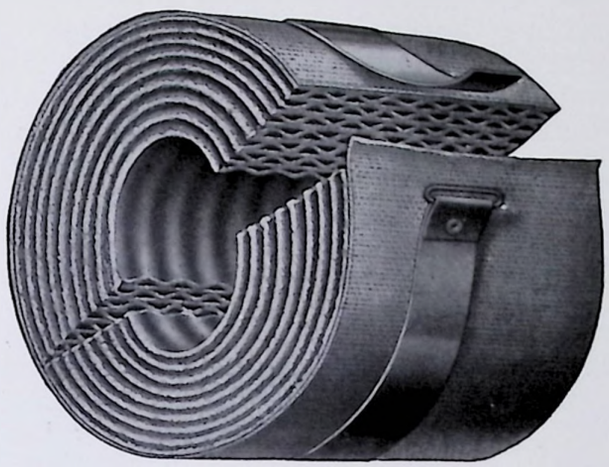
T. M. Sinclair Co., Cedar Rapids, Ia.
United Light & Railways Co., Davenport, Ia.
Leighton Supply Co., Fort Dodge, Ia.
Waterloo, Cedar Falls & Western Ry. Co., Waterloo, Ia.
Northwestern States Portland Cement Co., Mason City, Ia.
Loose-Wiles Biscuit Co., Minneapolis, Minn.
State University, Minneapolis, Minn.
Washburn Crosby Co., Minneapolis, Minn.
Omaha & Council Bluffs St. Rwy., Omaha, Neb.
Nebraska Gas & Elec. Co., Omaha, Neb.

Pacific States

Cal.-Hawaiian Sugar Co., Crockett, Cal.
Hercules Power Co., San Diego, Cal.
Shell Oil Co., San Francisco, Cal.
Libby, McNeill & Libby, San Francisco, Cal.
Spreckels Sugar Co., Spreckels, Cal.
Todd Dry Dock & Const. Co., Tacoma, Wash.
Skinner & Eddy Corp., Seattle, Wash.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 21 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/21

Johns-Manville Asbestocel Sectional Pipe Insulation



For insulating pipes conveying steam at medium or low pressures or for pipes conveying hot water.

JOHNS-MANVILLE Asbestocel is a cellular type of pipe insulation composed of alternate layers of plain and corrugated asbestos felt, built up in cylindrical form so that the air cells formed by the corrugations run *around* the pipe instead of parallel to the pipe.

Because of its circumferential cellular structure, longitudinal circulation of air is absolutely prevented.

Asbestocel is strong and durable because the cells form numerous arches which give the insulation strength, and this construction accounts for its ability to withstand vibration and wear and tear.

Johns-Manville Asbestocel Sectional Pipe Insulation is furnished in thicknesses from ½" to 3", in 3-foot sections with canvas jacket and brass-lacquered bands, to fit standard sizes of pipe. The ½", ¾" and 1" thicknesses are most generally used and efficiency tables are shown for these thicknesses only.

Specifications for Johns-Manville Asbestocel Insulation will be found on page 21.

Also furnished in sheet and block form for boilers, flues and other large regular surfaces. Sheets, 36" x 36" and blocks, 6" x 36", or special sizes, in thicknesses from ½" to 4".

For descriptive data on this insulation in sheet and block form, see page 37.

See approximate weights and price list on page 30.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 22 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/22

What Insulation Efficiency Means

The efficiency of an insulating material is expressed by a per cent, which is the per cent of heat saved by using the insulation as compared to what would be lost if no insulation were used and the pipe left bare or uninsulated.

The efficiency of all insulations varies according to the size of pipe to which they are applied and according to the difference in temperature between steam in the pipe and air surrounding the pipe, as well as according to thickness of insulation.

Complete information regarding the use of efficiency tables with examples to illustrate will be found on page 132.

For table showing total heat loss from BARE pipe, see page 133.

Efficiencies of ½" Thick Johns-Manville Asbestocel Sectional Pipe Insulation

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
½	36.4%	41.2%	45.2%	49. %	52.4%	55.6%	58. %	60.5%	62.9%	65.1%
¾	43.4	47.5	51.1	54.6	57.6	60.2	62.7	64.7	66.8	69.
1	48.2	52.1	55.4	58.4	61.	63.5	65.7	67.8	69.6	71.6
1¼	51.	54.6	57.9	60.7	63.2	65.5	67.6	69.5	71.1	72.9
1½	53.6	57.2	60.	62.7	65.	67.3	69.3	70.9	72.6	74.4
2	56.9	60.	62.9	65.4	67.5	69.6	71.4	72.9	74.6	75.9
2½	59.2	62.2	64.9	67.3	69.5	71.3	73.1	74.7	76.1	77.4
3	69.9	63.7	66.3	68.7	70.6	72.3	73.9	75.6	76.9	78.2
3½	62.2	64.7	67.3	69.6	71.4	73.3	74.9	76.4	77.5	78.9
4	63.4	65.8	68.1	70.3	72.3	73.9	75.6	77.1	78.2	79.5
4½	64.	66.5	68.8	71.	72.8	74.6	76.1	77.4	78.7	80.
5	64.5	67.	69.3	71.5	73.3	74.9	76.4	77.7	79.	80.2
6	65.2	67.8	69.9	71.9	73.8	75.6	77.1	78.4	79.5	80.7
7	65.8	68.5	70.4	72.4	74.4	75.9	77.5	78.7	79.9	81.2
8	66.5	69.	70.9	72.9	74.7	76.4	77.9	79.	80.2	81.4
9	67.	69.3	71.3	73.4	75.1	76.6	78.1	79.3	80.5	81.5
10	67.3	69.6	71.6	73.8	75.4	76.9	78.4	77.5	80.7	81.7

Efficiencies of ¾" Thick Johns-Manville Asbestocel Sectional Pipe Insulation

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
½	54.4%	56.8%	59.8%	62.7%	65.2%	67.5%	69.3%	71.1%	72.8%	74.5%
¾	58.4	61.5	64.1	66.7	68.9	70.8	72.6	74.1	75.7	77.2
1	62	64.9	67.3	69.5	71.5	73.3	74.8	76.4	77.7	79.2
1¼	64.	66.7	69.1	71.2	73.	74.7	76.3	77.6	78.8	80.2
1½	66.	68.6	70.7	72.7	74.4	76.	77.5	78.7	79.9	81.2
2	68.4	70.7	72.7	74.6	76.2	77.7	79.1	80.2	81.4	82.7
2½	70.1	72.3	74.2	76.	77.6	79.	80.3	81.5	82.5	83.4
3	71.3	73.4	75.3	77.	78.5	79.7	80.9	82.1	83.1	84.
3½	72.2	74.1	76.	77.7	79.1	80.4	81.6	82.7	83.6	84.5
4	73.1	74.9	76.6	78.2	79.7	80.9	82.1	83.2	84.	85.
4½	73.6	75.4	77.1	78.7	80.1	81.3	82.4	83.4	84.3	85.3
5	74.	75.8	77.5	79.1	80.4	81.6	82.7	83.7	84.6	85.5
6	74.5	76.4	77.9	79.4	80.8	82.1	83.2	84.2	85.	85.8
7	74.9	76.9	78.3	79.8	81.1	82.4	83.5	84.4	85.3	86.2
8	75.4	77.2	78.7	80.1	81.5	82.7	83.8	84.6	85.5	86.4
9	75.8	77.5	78.9	80.5	81.8	82.9	83.9	84.8	85.7	86.5
10	76.	77.7	79.2	80.8	82.	83.1	84.1	85.	85.9	86.6

Efficiencies of 1" Thick Johns-Manville Asbestocel Sectional Pipe Insulation

Pipe Size, Inches	Temperature Difference Between Steam in Pipe and Air Surrounding Pipe									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
½	61.5%	64.4%	66.8%	69.2%	71.2%	73.1%	74.6%	76.1%	77.5%	78.9%
¾	65.7	68.2	70.4	72.5	74.3	75.9	77.4	78.6	79.9	81.2
1	68.6	71.	73.	74.8	76.4	77.9	79.2	80.5	81.6	82.8
1¼	70.3	72.5	74.5	76.2	77.7	79.1	80.4	81.5	82.5	83.6
1½	71.9	74.1	75.8	77.4	78.8	80.2	81.4	82.4	83.4	84.5
2	73.9	75.8	77.5	79.	80.3	81.6	82.7	83.6	84.6	85.4
2½	75.3	77.1	78.7	80.2	81.5	82.6	83.7	84.7	85.5	86.3
3	76.3	78.	79.6	81.	82.2	83.2	84.2	85.2	86.	86.8
3½	77.1	78.6	80.2	81.6	82.7	83.8	84.8	85.7	86.4	87.2
4	77.8	79.3	80.7	82.	83.2	84.2	85.2	86.1	86.8	87.6
4½	78.2	79.7	81.1	82.4	83.5	84.6	85.5	86.3	87.1	87.9
5	78.5	80.	81.4	82.7	83.8	84.8	85.7	86.5	87.3	88.
6	78.9	80.5	81.8	83.	84.1	85.2	86.1	86.9	87.6	88.3
7	79.3	80.9	82.1	83.3	84.4	85.4	86.4	87.1	87.8	88.6
8	79.7	81.2	82.4	83.6	84.7	85.7	86.6	87.3	88.	88.7
9	80.	81.4	82.6	83.9	84.9	85.8	86.7	87.5	88.2	88.8
10	80.2	81.6	82.8	84.1	85.1	86.	86.9	87.6	88.3	88.9

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 23 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/23

Standard Specifications for Insulating Pipes Conveying Low Pressure Steam or Hot Water with Johns-Manville Asbestocel Insulation

ALL pipes conveying low-pressure steam or hot water shall be insulated with Johns-Manville Asbestocel Insulation of proper size and thickness. (See note "A.")

All fittings and valves shall be insulated with Johns-Manville Cement Felting, to be applied to a thickness equal to the adjoining pipe insulation.

All flanges shall be insulated by method "A" or "B," depending upon whether flange insulation is to be removable and replaceable or non-replaceable.

METHOD "A"

Use suitable size and length of Johns-Manville Asbestocel Sectional Insulation to completely encircle flanges and overlap the adjoining pipe insulation at least two inches (2″) on each side of the flange. Secure this flange covering with wire and fill space between pipe and flange insulation with Johns-Manville Cement Felting.

METHOD "B"

First prime flange surface with a thin coat of Johns-Manville Cement Felting applied so as to leave a rough surface. When dry follow with successive one-half inch coats of Johns-Manville Cement Felting until a thickness equal to that of the pipe insulation is obtained.

Each coat of this cement should be allowed to dry before the next coat is applied, and each coat should have a rough surface, except the final coat, which should be trowelled down to a smooth finish.

All of the above insulation, including fittings, valves and flanges, shall be finally finished and additionally protected with 8-ounce canvas neatly sewed on, over rosin-sized paper, and this canvas painted with either fireproof paint, or lead and oil paint, of the color desired. This extra canvas cover to be placed over the canvas jacket furnished with the insulation. (When re-canvasing is not desired or considered unnecessary, see note "B.")

If piping is located out-of-doors and exposed to the weather, the additional protection of 8-ounce canvas and paint may be omitted and in its place the insulation shall be protected with a Johns-Manville Asbestos Weather-proof Pipe Insulation Jacket, secured with copper wire, No. 18 gauge, wound spirally at 3″ centers, and this spiral winding additionally secured with rings formed of No. 18 copper wire wound once around the jacket and ends twisted tightly together. These wire rings to be placed on 4″ centers. The jacket to lap at least 3″ in all directions, and all horizontal laps to be located on the side of the insulation and to look downward in order to shed all water from the surface. (See note "C.")

NOTE "A"—Johns-Manville maintains an engineering department at each of its branches, which will, on request, recommend proper thickness for various pressures and temperatures.

NOTE "B"—If insulation is not to be re-canvased, lacquered bands furnished with the insulation are to be applied, at 18″ intervals, on all sectional covering.

NOTE "C"—When extremely low temperatures are encountered out-of-doors, special recommendations will be given by any of our Branch Engineering Departments.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 24 of 154
asbestosclaims.law/library/21286/24

A Few Prominent Users of Johns-Manville Asbestocel Sectional Pipe Insulation

Canadian

Dominion Government House, Toronto, Ont.
Canada Life Bldg., Toronto, Ont.
Polson Iron Works, Toronto, Ont.
Gutta Percha & Rubber, Ltd., Toronto, Ont.
W. K. Kellogg Co., Toronto, Ont.
Grand Trunk Railway, Montreal, Que.
Canadian Pacific Railway, Winnipeg, Man.
Canadian Northern Railway, Winnipeg, Man.
Normal School, Regina, Sask.
Telephone Exchange, Regina, Sask.

New England States

New Departure Mfg. Co., Bristol, Conn.
C. S. Mersick Co., New Haven, Conn.
H. L. Judd Co., Wallingford, Conn.
M. J. Daly & Sons, Waterbury, Conn.
Standard Fabric Co., Fall River, Mass.
Fabyan Woolen Co., Medway, Mass.
Woonsocket Rubber Co., Millville, Mass.
Centredale Worsted Mills, Centredale, R. I.
D. Goff & Sons, Pawtucket, R. I.
Taft-Pierce Co., Woonsocket, R. I.
Eastern Mfg. Co., South Brewer, Me.

Middle Atlantic States

Pierre S. Du Pont Residence, Wilmington, Del.
Grasselli Chemical Co., Grasselli, N. J.
Merck & Co., Rahway, N. J.
Sussex Print Works, Sussex, N. J.
Empire State Dairy Co., Brooklyn, N. Y.
Robert Gair Co., Brooklyn, N. Y.
Mohawk Valley Paper Co., Little Falls, N. Y.
Geo. A. Swalm & Son Co., Middletown, N. Y.
Witherbee-Sherman Co., Minersville, N. Y.
Eugene Meyer, Jr., Residence, Mt. Kisco, N. Y.
Hotaling-Warner Co., New York City, N. Y.
Thompson-Starrett Co., New York City, N. Y.
Dept. of Health, New York City, N. Y.
Elk Tanning Co., New York City, N. Y.
Diamond Match Co., New York City, N. Y.
Standard Oil Co. of N. J., New York City, N. Y.
American Can Co., New York City, N. Y.
Edward P. Bates Co., Inc., Syracuse, N. Y.
New Process Gear Corp., Syracuse, N. Y.
Bucknell University, Lewisburg, Pa.
Blumenthal Brothers, Philadelphia, Pa.
Bethlehem Steel Co., Steelton, Pa.
William Penn Hotel, Pittsburgh, Pa.

Southern States

Mobile Gas Co., Mobile, Ala.
Gulf City Gas Co., Biloxi, Miss.
Anderson-Tully Lbr. Co., Vicksburg, Miss.
Leonard Tufts, Pinehurst, N. C.
S. J. Basseler, Columbia, S. C.
Central States Hospital, Petersburg, Va.

Central States

Illinois Glass Co., Alton, Ill.
Continental Can Co., Chicago, Ill.
Advance Rumely Co., Laporte, Ind.
East St. Louis & Suburban Rwy., E. St. Louis, Ill.
American Carbon & Battery Co., E. St. Louis, Ill.
General Roofing Mfg. Co., E. St. Louis, Ill.
East Side Packing Co., E. St. Louis, Ill.
Oliver Chilled Plow Co., South Bend, Ind.
Studebaker Corporation, South Bend, Ind.
Grasselli Chemical Co., Grasselli, Ind.
Rockwood Mfg. Co., Indianapolis, Ind.
Crane Co., Indianapolis, Ind.
Larrowe Const. Co., Detroit, Mich.
Grasselli Chemical Co., Canton, O.
Grasselli Chemical Co., Cleveland, O.
Pennsylvania Ore Dock & Unloading Station, Cleveland, O.
Mechanical Rubber Co., Cleveland, O.
Ohio State University, Columbus, O.
George Peabody College, Nashville, Tenn.
Noel & Co., Nashville, Tenn.
Grasselli Chemical Co., Meadow Brook, W. Va.
Diamond Lumber Co., Green Bay, Wis.
Nash Motors Co., Kenosha, Wis.
Crosby Transportation Co., Milwaukee, Wis.
Morgan Co., Oshkosh, Wis.

Southwestern States

Midwest Refining Co., Denver, Col.
United Oil Co., Denver, Col.
Greybull Refining Co., Denver, Col.
Webster School Bldg., Wichita, Kan.
Swift & Co., Fort Worth, Tex.
Wichita Pipe Line Co., Drumright, Okla.
J. L. Moore Residence, Tulsa, Okla.
Cosden & Co., West Tulsa, Okla.

Northwestern States

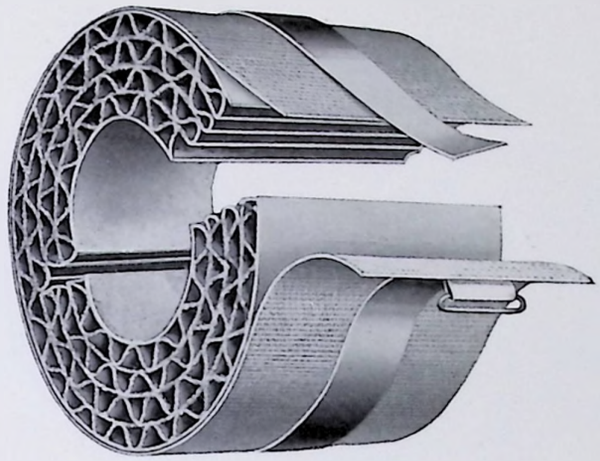
Larrowe Const. Co., Paul, Idaho.
Carr, Ryder & Adams Co., Dubuque, Ia.
Anaconda Copper Mining Co., Butte, Mont.
Hord Alkali Products Co., Lakeside, Neb.
Midwest Refining Co., Casper, Wyo.
Larrowe Const. Co., Worland, Wyo.

Pacific States

Northwestern Fisheries Co., Nushagak, Alaska.
State Home of the Blind, Berkeley, Cal.
C. Swanston & Sons, Sacramento, Cal.
Sanborn Cutting Co. Cannery, Astoria, Ore.
East Oregon Lumber Co., Enterprise, Ore.
Everett Public Schools, Everett, Wash.
Ames Shipbuilding & Drydock Co., Seattle, Wash.
Arctic Club Bldg., Seattle, Wash.
Frye & Co. Markets, Seattle, Wash.
Spokane Public Schools, Spokane, Wash.
Tacoma Smelting Co., Tacoma, Wash.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 25 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/25

Johns-Manville Air-Cell Sectional Pipe Insulation



For low pressure steam and hot water pipes.

JOHNS-MANVILLE Air-Cell is a cellular insulation constructed of layers of plain and corrugated asbestos paper, with the channels running parallel with the length of the pipe.

Johns-Manville Air-Cell Sectional Pipe Insulation is furnished in thicknesses from ½″ to 3″; in 3-foot sections with canvas jacket and brass-lacquered bands, to fit standard pipe sizes. ¾″ and 1″ thicknesses are most commonly used.

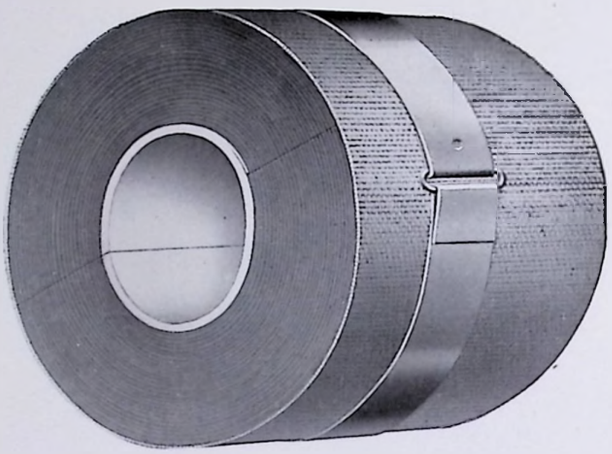
Also furnished in sheet and block form for boilers, flues and other large regular surfaces. Sheets 36″ x 36″ and blocks 6″ x 36″, or in special sizes, in thicknesses from ¼″ to 4″.

For descriptive data on this insulation in sheet and block form, see page 37.

See approximate weights and price list on page 30.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 26 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/26

Johns-Manville Wool Felt Sectional Pipe Insulation



For low pressure steam and hot water heating systems.

THESE coverings are made of wool felt, lined with asbestos felt and are recommended as an inexpensive covering for low pressure steam and hot water heating systems.

Made in sections three feet long and manufactured in three styles:

"STANDARD"—Laminations of wool felt 1″ thick with an inner lining of one layer of asbestos paper.

"CHAMPION" or "EXPRESS"—Laminations of wool felt ¾″ thick with one layer of asbestos paper lining.

"AQUA" or "C-B"—Laminations of wool felt ½″ thick with one layer of asbestos paper lining.

Not furnished in sheet and block form.

See approximate weights and price list on page 30.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 27 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/27

Johns-Manville Cold Water Insulations

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 28 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/28

Johns-Manville Built-Up Brine and Ammonia Insulation

For maintaining the extremely low temperature required in pipe lines conveying brine or ammonia.

Johns-Manville Built-Up Brine and Ammonia Insulation consists of several layers of insulating felts carefully applied around pipes to be insulated.

On account of the high insulating qualities of the hair felt used, the flexibility of hair felt and the method of sealing, Johns-Manville Built-Up Brine and Ammonia Insulation is not only highly efficient as an insulator, but will withstand contraction and expansion without cracking or breaking open, and all chance of moisture accumulating between pipe and insulation and then freezing and breaking the insulation open is eliminated.

This form of insulation should be applied by Johns-Manville.

Applied prices quoted on request.

The conductivity of Johns-Manville Brine and Ammonia Insulation is .30 B.t.u., and the conductivity of cork is about .35 B.t.u. per square foot per degree temperature difference per hour per inch thickness. Following table gives HEAT TRANSMISSION.

Heat Transmission Through Johns-Manville Built-up Brine and Ammonia Insulation

The rates of heat transmission given below are expressed in B. t. u. per hour, per degree temperature difference between fluid in the pipe and air surrounding pipe, per linear foot of pipe and per square foot of pipe surface.

Pipe Size	2 LAYER		3 LAYER		4 LAYER	
	Per lin. ft. of pipe	Per sq. ft. of pipe	Per lin. ft. of pipe	Per sq. ft. of pipe	Per lin. ft. of pipe	Per sq. ft. of pipe
½ in.	.086	.390	.074	.331	.065	.295
¾ in.	.095	.345	.079	.288	.070	.255
1 in.	.107	.310	.088	.257	.078	.227
1¼ in.	.124	.285	.102	.235	.090	.206
1½ in.	.132	.265	.109	.218	.095	.190
2 in.	.149	.240	.120	.193	.104	.167
2½ in.	.167	.222	.133	.177	.114	.151
3 in.	.192	.210	.151	.165	.128	.140
3½ in.	.211	.201	.165	.157	.138	.132
4 in.	.228	.194	.176	.150	.148	.126
4½ in.	.247	.188	.190	.145	.158	.121
5 in.	.268	.184	.205	.141	.170	.117
6 in.	.307	.177	.233	.134	.192	.111
7 in.	.343	.172	.257	.129	.211	.106
8 in.	.380	.168	.282	.125	.230	.102
9 in.	.415	.165	.307	.122	.250	.099
10 in.	.455	.162	.335	.119	.273	.097
12 in.	.528	.158	.387	.116	.311	.093

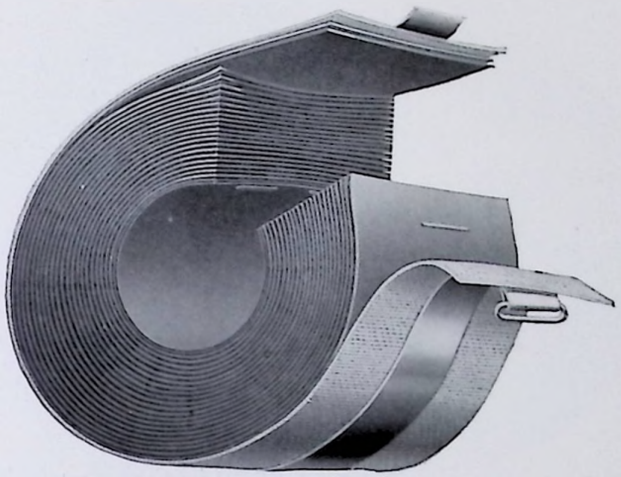
Johns-Manville Built-Up Hair Felt Insulation

Johns-Manville applies hair felt in required thickness and numbers of layers to prevent the freezing of pipes conveying water and subjected to severe conditions.

As flow of water, duration of low temperatures and other factors have much to do with the thickness and method of application, we advise consultation with our nearest branch.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 29 of 154
asbestosclaims.law/library/21286/29

Johns-Manville Anti-Sweat Sectional Pipe Insulation



To prevent condensation on cold-water pipes and consequent damage to merchandise or stock in stores or factories, and draperies, carpets, etc., in hotels and dwellings; may also be used for insulating ice and cold-water lines.

JOHNS-MANVILLE Anti-Sweat Sectional Pipe Insulation of suitable thickness prevents pipes from "sweating" in warm weather, by insulating the cold pipe surface from warm or moist air that may surround it.

Constructed of alternate layers of asbestos water-proofed and insulating felts and saturated wool felts, built up in cylindrical form and held together by wire-stitching. This construction makes this product a durable, water-resisting covering to take care of pipe sweating, and on account of the insulating value of felts used in its construction, it is used for insulating cold-water and ice-water lines.

Johns-Manville Anti-Sweat Sectional Pipe Insulation is furnished in thicknesses of ½", ¾" and 1", in 3-foot sections with canvas jacket and brass-lacquered bands, to fit standard pipe sizes.

Not furnished in sheet and block form.

See approximate weights and price list on page 30.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 30 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/30

Data on Heat Transmission Through Johns-Manville Anti-Sweat Pipe Insulation

Type of Insulation	Thickness of Insulation	Heat transmission or number of B. t. u. that will be conducted through 1 sq. ft. of pipe surface per hour, per degree of difference in temperature between the air surrounding the insulated pipe and the fluid in the insulated pipe
Johns-Manville Anti-Sweat	½″	.79 B. t. u.
Johns-Manville Anti-Sweat	¾″	.59 B. t. u.
Johns-Manville Anti-Sweat	1″	.49 B. t. u.
Johns-Manville Anti-Sweat	1½″	.40 B. t. u.
Johns-Manville Anti-Sweat	2″	.34 B. t. u.

General Recommendations

For insulating ice-water lines where the humidity in the room is high (above 90%) use Anti-Sweat 2″ thick.

For insulating cold-water pipes (average room conditions), recommend Johns-Manville Anti-Sweat as follows:

Temperature of Water in Pipe to be Insulated	Thickness of Anti-Sweat
50° to 70° F	1″ thick
32° to 50° F	1½″ thick

Standard Specifications for Insulating Pipes Containing Cold or Ice Water

ALL pipes conveying ice water shall be insulated with Johns-Manville Wire-Stitched Anti-Sweat Sectional Pipe Insulation applied in two layers, not less than ¾″ thick each, and applied so that all joints, both longitudinal and circumferential, shall be staggered or broken and additionally sealed with an asphaltic compound.

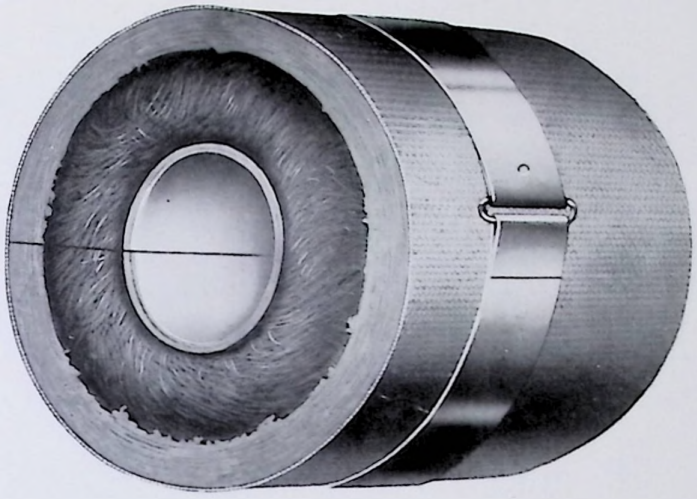
All pipes conveying cold water shall, in order to prevent condensation on surface of same, be covered with Johns-Manville Wire-Stitched Anti-Sweat Sectional Pipe Insulation not less than 1″ thick.

Where thickness over 1″ is required, apply 2 layers of sectional insulation with all joints broken or staggered and additionally sealed with an asphaltic compound.

Except where insulation is concealed in walls or ceiling, apply over same an additional protection of 8-ounce canvas, neatly sewed on, and where exposed to the weather, this canvas jacket may be omitted, and in its place the insulation shall be protected with a layer of Johns-Manville Asbestos Weather-proof Pipe Insulation Jacket secured with copper wire, No. 18 gauge, wound spirally on 3″ centers, and this spiral winding additionally secured with rings formed of No. 18 copper wire wound once around the jacket and ends twisted tightly together. These wire rings to be placed on 4″ centers. The jacket to lap at least 3″ in all directions, and all horizontal laps to look downward, in order to shed all water from the surface.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 31 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/31

Johns-Manville Zero Sectional Pipe Insulation



JOHNS-MANVILLE Zero Sectional Cold Water Pipe Insulation is constructed of a layer of 1″ hair felt surrounded by several layers of wool felt and with a layer of saturated wool felt inside the hair part of the insulation. This prevents the hair from coming in direct contact with the pipe.

Hair Felt, one of the best known non-conductors of heat, greatly retards the flow of heat from the water in the pipe to the cold surrounding air, and the wool felt jacket and the inner layer of saturated felt provide protection for the hair-felt lining.

This material is designed and is constructed for insulating cold water pipes that are located where there is a likelihood of the water in the pipes freezing but where temperatures are moderate rather than extreme or where the length of time that the surrounding air would be below freezing-point is of short duration.

Where pipes run out of doors and are subjected to severe conditions or extreme temperatures, Johns-Manville Built-up Hair Felt of suitable thickness should be applied. (See page 26.)

Johns-Manville Zero Sectional Pipe Insulation is furnished in one thickness only (approximately 1¼″), in 3-foot sections with canvas jacket and brass-lacquered bands, to fit standard pipe sizes.

Not furnished in sheet and block form.

See approximate weights and price list on page 30.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 32 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/32

Approximate Weights of Johns-Manville Sectional Insulations

(WEIGHTS GIVEN ARE POUNDS PER STANDARD 3-FOOT SECTION)

Kind of Covering	Thickness	Pipe Sizes																	
		½″	¾″	1″	1¼″	1½″	2″	2½″	3″	3½″	4″	4½″	5″	6″	7″	8″	9″	10″	12″
Asbesto Sponge	Std.	4.35	4.70	5.26	6.00	6.42	7.38	8.31	9.52	10.6	11.6	12.5	13.8	15.7	17.7	19.7	21.7	23.8	27.8
" "	1½″	8.95	9.50	10.4	11.4	12.0	13.3	14.7	16.5	17.9	19.4	20.8	22.7	25.6	28.3	31.0	34.0	37.2	43.0
" "	2″	13.0	13.6	14.8	16.2	17.0	18.8	20.7	23.1	25.2	27.1	29.0	31.5	35.2	39.1	43.0	37.0	51.3	59.2
" "	3″	25.4	26.5	28.2	29.7	31.6	34.3	37.2	41.0	43.8	46.7	49.7	53.7	59.3	65.2	70.8	76.8	83.5	95.5
85% Magnesia	Std.	1.62	1.85	2.02	2.39	2.74	3.77	4.30	5.00	5.57	6.83	7.42	8.05	9.35	11.9	13.2	14.5	16.1	23.0
" "	1½″	3.77	4.12	4.59	5.10	5.52	6.27	7.16	8.10	8.88	9.70	10.5	11.4	13.1	14.7	16.3	18.0	19.8	23.0
" "	2″	6.11	6.75	7.30	7.89	8.40	9.42	10.6	11.9	12.9	14.0	15.2	16.4	18.6	20.8	23.0	25.1	27.5	31.6
" "	Dbl. Std.	4.86	5.31	5.80	6.42	7.23	9.82	10.9	12.3	13.4	16.4	17.6	19.0	21.5	27.3	29.9	32.6	35.7	50.7
" "	3″	12.4	13.2	14.0	15.2	16.0	17.4	19.1	21.1	22.6	24.2	25.9	27.7	31.1	34.4	37.5	40.7	44.3	50.7
Fire-Felt	Std.	4.80	5.06	5.35	6.00	6.40	7.08	7.88	8.80	9.53	10.3	11.1	12.0	13.6	15.2	16.8	18.2	19.9	23.0
" "	1½″	9.70	10.1	10.6	11.4	12.0	12.9	14.0	15.4	16.4	17.5	18.5	19.8	22.0	24.2	26.3	28.4	30.7	35.0
" "	2″	13.0	13.6	14.3	15.6	16.4	17.8	19.3	21.3	22.8	24.4	26.0	27.8	31.1	34.3	37.5	40.7	44.2	50.6
" "	3″	23.0	23.8	24.9	27.0	28.2	30.4	32.8	35.9	38.4	40.8	43.4	46.1	51.3	56.2	61.0	66.1	71.4	81.4
Air-Cell	½″	0.70	0.80	1.00	1.17	1.30	1.50	1.76	2.10	2.37	2.60	2.90	3.17	3.70	4.26	4.80	5.32	5.90	7.00
"	¾″	1.00	1.20	1.35	1.60	1.75	2.05	2.42	2.85	3.22	3.55	3.90	4.30	5.10	5.80	6.50	7.25	8.00	9.40
"	1″	1.40	1.55	1.80	2.08	2.28	2.60	3.08	3.60	4.00	4.40	4.80	5.34	6.20	7.00	7.82	8.67	9.60	11.2
Asbestocel	½″	1.72	1.89	2.08	2.31	2.47	2.80	3.20	3.60	4.00	4.31	4.68	5.10	5.78	6.50	7.20	7.90	8.68	10.1
"	¾″	2.35	2.60	2.88	3.23	3.45	3.91	4.41	5.00	5.53	6.04	6.53	7.20	8.20	9.20	10.2	11.2	12.3	14.3
"	1″	3.80	4.02	4.40	4.82	5.10	5.68	6.30	7.08	7.78	8.37	9.00	9.80	11.0	12.2	13.4	14.6	16.1	18.6
AquaWoolFelt	½″	.78	.90	1.08	1.23	1.35	1.65	1.90	2.27	2.54	2.83	3.17	3.48	4.08	4.70	5.32	5.93	6.60	7.80
Champion Wool Felt	¾″	1.08	1.20	1.40	1.60	1.72	2.08	2.40	2.75	3.12	3.48	3.82	4.20	4.90	5.63	6.32	7.08	7.75	9.17
Standard Wool Felt	1″	1.50	1.70	1.92	2.16	2.35	2.75	3.18	3.60	4.04	4.48	4.90	5.37	6.22	7.10	7.90	8.75	9.62	11.3
Anti-Sweat	½″	3.40	3.80	4.20	4.55	4.94	5.70	6.50	7.30	8.10	8.80								
"	¾″	4.90	5.40	5.90	6.40	6.80	7.85	8.80	9.80	10.7	11.7								
"	1″	7.20	8.00	8.60	9.30	10.0	11.4	12.8	14.2	15.6	17.0								
Solid WoolFelt	½″	1.40	1.60	1.82	2.08	2.28	2.70	3.15	3.60	4.00	4.50								
" " "	¾″	2.35	2.60	2.90	3.23	3.50	4.10	4.70	5.30	5.90	6.50								
" " "	1″	3.10	3.63	4.20	4.75	5.30	6.40	7.50	8.54	9.63	10.7								
Zero	Std.	4.00	4.43	4.88	5.30	5.72	6.67	7.60	8.50	9.40	10.3								

List Prices per Lineal Foot for Johns-Manville Sectional Pipe Insulation as Shown

SUBJECT TO DISCOUNT

	INSIDE DIAMETER OF PIPE																					
	½″	¾″	1″	1¼″	1½″	2″	2½″	3″	3½″	4″	4½″	5″	6″	7″	8″	9″	10″	12″	*14″	16″	18″	20″	24″	30″
Standard Thick..	$ .22	$ .24	$ .27	$ .30	$ .33	$ .36	$ .40	$ .45	$ .50	$ .60	$ .65	$ .70	$ .80	$ 1.00	$ 1.10	$ 1.20	$ 1.30	$ 1.85	$ 2.10	$ 2.35	$ 2.60	$ 2.85	$ 3.30	$ 4.00
1½″ Thick..	.46	.49	.52	.56	.60	.64	.70	.76	.82	.88	.94	1.00	1.10	1.20	1.35	1.50	1.65	1.85	2.10	2.35	2.60	2.85	3.30	4.00
2″ Thick	.75	.80	.85	.90	.95	1.00	1.05	1.15	1.25	1.35	1.45	1.55	1.70	1.85	2.00	2.20	2.40	2.70	3.00	3.30	3.60	4.00	4.50	5.50
**Double Standard Thick..	.65	.70	.75	.80	.85	.90	1.00	1.10	1.20	1.40	1.50	1.60	1.80	2.25	2.50	2.70	2.90	4.10	4.60	5.10	5.60	6.00	7.00	8.40
3″ Thick Broken Joints..	1.20	1.35	1.40	1.45	1.55	1.65	1.75	1.90	2.05	2.20	2.35	2.50	2.70	2.90	3.15	3.40	3.65	4.10	4.60	5.10	5.60	6.00	7.00	8.40

	½″	¾″	1″	1¼″	1½″	2″	2½″	3″	3½″	4″	4½″	5″	6″	7″	8″	9″	10″
	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Elbows 90° & 45°..	.30	.30	.30	.30	.30	.36	.42	.48	.54	.60	.72	.90	1.30	1.80	2.40	3.00	3.60
Tees	.36	.36	.36	.36	.36	.42	.48	.54	.60	.75	.90	1.20	1.60	2.20	3.00	3.80	4.60
Crosses	.48	.48	.48	.48	.48	.54	.60	.70	.80	.95	1.10	1.50	2.00	2.80	3.60	4.40	5.20
Globe Valves	.54	.54	.54	.54	.54	.60	.78	.96	1.20	1.50	1.85	2.25	2.80	3.60	4.40	5.30	6.20
Flange Covers	.50	.50	.50	.50	.50	.60	.70	.80	.90	1.00	1.30	1.60	1.90	2.20	2.50	2.90	3.30

These pipe insulations are supplied in sections three feet long, canvased and with brass lacquered bands.

*85% Magnesia is made in Standard (approx. 1″), 1½″, 2″, Double Standard Thick and 3″ (broken joint) thicknesses. For pipe sizes from and including 14″ in diameter it is furnished in segmental form.

Asbesto-Sponge Felted Insulation is made in thicknesses from ½″ to 3″; thicknesses 1″ and under use list prices for standard thick.

Asbestocel and Air-Cell Insulations are made in ½″, ¾″, 1″, 1½″, 2″, and 3″ thicknesses; for thicknesses 1″ and under use list prices for standard thick.

Zero Insulation is made in one thickness only, approximately 1¼″. Use standard thick list prices. Prices on Zero Insulation for fittings on request.

Anti-Sweat Insulation is made only in ½″, ¾″ and 1″ thicknesses; use standard thick list prices for all thicknesses.

Fittings not made for 85% Magnesia or Wool Felt Insulations.

**Applies only to 85% Magnesia.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 33 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/33

Johns-Manville Insulating Sheets and Blocks

MOST Johns-Manville pipe insulating materials are also manufactured in sheet or block form, and generally the various types of Johns-Manville Sheets and Blocks are recommended for the same service as the material in sectional form.

However, the character of the surface to be insulated has much to do with the selection of proper material, and Johns-Manville manufacture and are prepared to recommend whatever form of insulation is most efficient, durable and adaptable to the condition to be cared for. The descriptions of the various forms of Johns-Manville Sheets and Blocks which follow cover these conditions.

When considering the application of insulation in sheet or block form, the nearest Johns-Manville Branch, through its corps of engineers, will advise you the proper material to use. It is a service that will advise you by mail or send a man to assist you—a service that offers you the benefit of an experience gained by over half a century in insulation manufacture and application.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 34 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/34

Johns-Manville Asbesto-Sponge Felted Sheets and Blocks



For efficiently insulating any surface to which these sheets may be fitted, providing the temperature of the surface to which the material is applied does not exceed 700° Fahrenheit

JOHNS-MANVILLE Asbesto-Sponge Felted Sheets and Blocks are constructed by building up to the required size and thickness a number of sheets of Asbesto-Sponge Felt—same as used in the manufacture of Asbesto-Sponge Felted Pipe Insulation.

This felt is composed of asbestos fibre and finely ground spongy material, forming an extremely cellular felt. It contains an enormous quantity of minute, confined dead-air spaces. Additional dead-air space is formed between the layers of the felt.

On account of the material used and the manner of constructing Asbesto-Sponge Felted Sheets and Blocks, they will withstand vibration, shocks, and general rough usage without the crumbling or pulverizing so common where moulded sheets and blocks are employed.

Furnished in sheets, 24″x36″, and blocks, 6″x36″, from ½″ to 4″ in thickness.

For efficiencies of Johns-Manville Asbesto-Sponge Felted Sheets and Blocks, see page 41.

See approximate weights and price list on page 43.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 35 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/35

Johns-Manville 85% Magnesia Blocks



For insulating flat, curved and irregular surfaces

JOHNS-MANVILLE 85% Magnesia Blocks are composed of 85% Carbonate of Magnesia and 15% Asbestos fibre, moulded into block form. This material is particularly adapted to conditions where it is necessary to use material that is light in weight, or where surfaces are so irregular that it is necessary to use a material that can be broken in order to apply it to the irregularities.

Furnished in blocks 3″x18″ and 6″x36″, from ½″ to 4″ in thickness.

For efficiencies of Johns-Manville 85% Magnesia Blocks, see page 41.

See approximate weights and price list on page 43.

Johns-Manville 85% Magnesia Locomotive and Air Pump Lagging

JOHNS-MANVILLE 85% Magnesia Blocks are furnished in suitable sizes and curved to proper radius to fit the curvature of locomotive boilers and air pumps.

For list prices of locomotive block lagging, see page 43.

Prices for air pump lagging quoted on application.

Method of Applying

Wires are passed around the boiler at about 4 inches from the ends of every course of blocks. Special T-hooks for fastening, engage the wires, and the blocks are slipped under the hook, which holds them firmly in place. This method of fastening permits the removal, when necessary, of a single block without disturbing the others. When all blocks are laid, iron bands are passed around the lagging and buckled on, thus closing the joints and binding the blocks securely together.

Blocks may be cut with saw, knife or chisel.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 36 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/36

Johns-Manville Thermo Fire-Felt Sheets and Blocks



An improved, efficient sheet or block for insulating hot blast stoves in steel plants, dry kilns and dry rooms in industrial plants, breechings, flues, etc.



Section Showing Cellular Center

JOHNS-MANVILLE Thermo Fire-Felt is made by felting and molding asbestos fibre into sheets of proper size and thickness, with a cellular structure imbedded in its center. This cellular structure, which does not extend to the edges of the sheet but is completely sealed in, makes the sheet more efficient on account of confined air space, adds strength, and gives the sheet the desirable property of resiliency which adapts it to conditions where expansion and contraction are large factors.

Furnished standard in sheets 24″x36″ in thicknesses from 1½″ to 4″.

May be made in curved sheets or in sheets of special size.

For efficiencies of Thermo Fire-Felt Sheets and Blocks, see page 42.

See approximate weights and price list on page 43.

Johns-Manville Vitro Fire-Felt Sheets and Blocks

For the insulation of hot blast mains and bustle pipes or particularly severe heat conditions, we recommend the use of Johns-Manville Vitro Fire-Felt between shell and fire-brick. Thermally efficient, this insulation is exceptionally strong and durable.

Johns-Manville Vitro Fire-Felt is similar in construction to Thermo Fire-Felt with the exception that the imbedded cellular structure is more rigid and has greater heat-resisting qualities.

Furnished standard in sheets 24″x36″ in thicknesses from 1½″ to 4″.

May be made in curved sheets or in sheets of special size.

See approximate weights and price list on page 43.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 37 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/37

Johns-Manville Asbestos Fire-Felt Sheets and Blocks



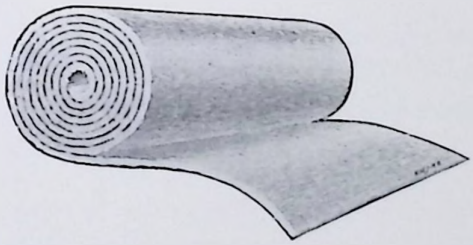
Especially adapted to insulating extremely hot surfaces

JOHNS-MANVILLE Fire-Felt Sheets and Blocks are made by felting and molding asbestos fibre into sheet or block form. Our moulding process produces a heat-resisting material, with good insulating value, that is strong and resilient, and that will not powder or crumble even if applied to surfaces that move or vibrate.

Furnished in standard blocks 6″x36″ and sheets 24″x36″ in thicknesses from ½″ to 4″. May be furnished to fit curved surfaces.

See approximate weights and price list on page 43.

Johns-Manville Asbestos Roll Fire-Felt



A SOFT, flexible felt of asbestos fibre, used for a great variety of purposes where there is need of an insulating and heat-resisting felt that may be folded, bent or even wrapped around pipes and heated surfaces.

It is especially adapted to wrapping around pipes which are too close to adjacent pipes or partitions to permit the use of sectional covering.

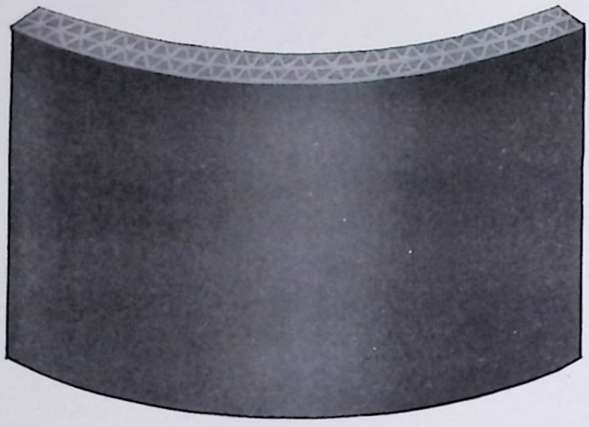
Furnished in thicknesses of 3/32″, 1/8″, 3/16″, 1/4″ and 3/8″, in roll form 3 feet wide, containing approximately 100 square feet. List prices:

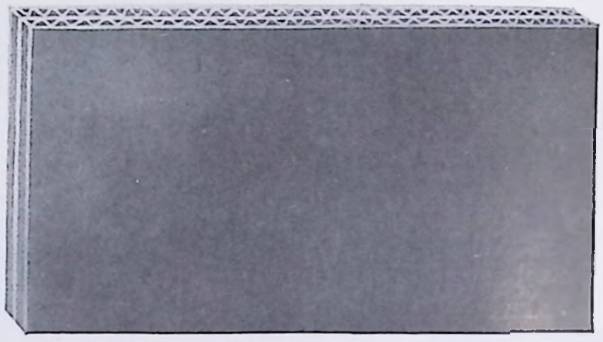
	Per Sq. Ft.
3/32″ thick	$0.16
1/8″ thick	.20
3/16″ thick	.26
1/4″ thick	.30
3/8″ thick	.50

See approximate weights on page 43.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 38 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/38

Johns-Manville Vitribestos Sheets and Blocks





FOR lining smokestacks and flues, building theatre curtains and for use where a strong, stiff insulating sheet or block is required that will resist temperatures up to 800° F.

Johns-Manville Vitribestos is made of asbestos felts which have been corrugated and built up to form a cellular sheet. These sheets are subjected to a treatment and process which vitrifies them and makes them more resistant to moisture and high temperatures than other cellular sheets which have not been vitrified.

The vitrified sheet has not, however, as great an insulating value as other sheets and their use should, therefore, be confined to those places which require the qualities referred to above.

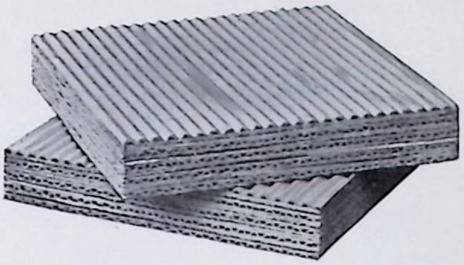
Johns-Manville Vitribestos Sheets are made curved to any radius and on account of their insulating value are admirably adapted to use as a stack lining. They are especially adapted to the lining of steel stacks on account of their light weight.

Drawings showing arrangement of curved angles that provide for the easy application of stack lining will be furnished upon request.

Vitribestos when used as a flue lining or for building fire-proof theatre curtains is held in place and supported by steel angles, the application of which depends upon the construction of the steel flue or type of theatre curtain required. Full particulars and details will be furnished by any of our Branches.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 39 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/39

Johns-Manville Asbestocel Sheets and Blocks



For insulating medium or low-pressure boilers, feed-water heaters, some types of dry kilns and other surfaces whose temperatures are not extreme

JOHNS-MANVILLE Asbestocel Sheets and Blocks are made of plain and corrugated asbestos felts, combined to form a cellular structure, several of which are built up one upon another until proper thickness is obtained.

The cellular channels of adjoining layers cross each other at right angles, which not only makes the sheet strong and durable, but reduces the tendency of air circulation through the sheet to a minimum.

Asbestos Felt offers high resistance to heat and in cellular form provides particularly good insulation.

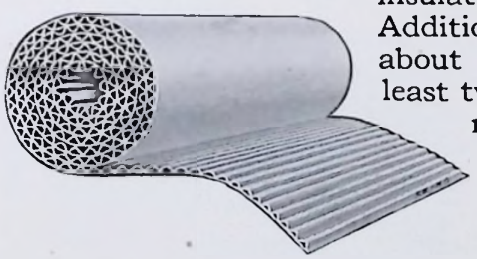
Furnished in standard sheets, 36″x36″, or blocks, 6″x36″, in thickness from ½″ to 4″.

For efficiencies of Johns-Manville Asbestocel Sheets and Blocks, see page 41 and 42.

See approximate weights and price list on page 43.

Johns-Manville Asbestocel
(*In Flexible Roll Form*)

John-Mansville Asbestocel in flexible roll form is made by fastening together a plain and a corrugated asbestos sheet. It is generally used for insulating hot-air heater or furnace pipes, etc. It is applied by wrapping one or more times around the pipe to be insulated and fastened on with wire wound around it spirally. Additional fastening should be provided by wire rings placed about every 18 inches. We recommend the application of at least two layers of Asbestocel to furnace pipes. Furnished in rolls 3 feet wide containing approximately 250 square feet.



List Price

	Per Sq. Ft.
1-Ply, about ¼″ thick	$0.10

Johns-Manville Air Cell Sheets and Blocks

This is the same material as used in Johns-Manville Air-Cell Sectional Pipe Covering described on page 23. It is furnished in sheets, 36″x36″, and blocks, 6″x36″, or special sizes in thicknesses from ¼″ to 4″.

See approximate weights and price list on page 43.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 40 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/40

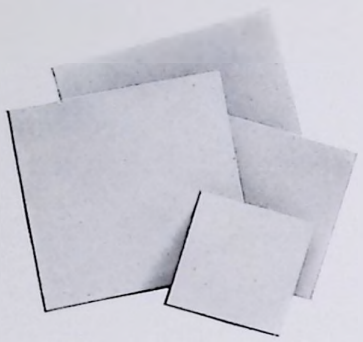
Johns-Manville Asbestos Sheet Millboard

For general use where sheet or board is desired for protection against fire, heat, acid fumes, etc. Made of asbestos fibre and suitable binders

JOHNS-MANVILLE Asbestos Sheet Millboard is extensively used for lining doors, partitions and floors, and for a variety of heat-resisting purposes in factories, mills and power plants where fire protection is necessary or desirable.

Standard sheets, 40″x40″ and 42″x44″.

Made in three grades, hard, medium and soft. Medium furnished unless otherwise specified. Prices on application.



Weights of Johns-Manville Asbestos Sheet Millboard

Thickness	Weights Per Sheet 40″x40″	Weights Per Sq. Ft.
1/32 Inches	2.4 Pounds	3.4 Ounces
3/64 "	2.75 "	4 "
1/16 "	3.65 "	5.3 "
5/64 "	5 "	7.2 "
3/32 "	5.5 "	8 "
1/8 "	7 "	10 "
5/32 "	9 "	13 "
3/16 "	10 "	14.5 "
1/4 "	14 "	22 "
5/16 "	17 "	25.5 "
3/8 "	20 "	29 "
1/2 "	25 "	36 "

Johns-Manville Asbestos Paper and Roll Board

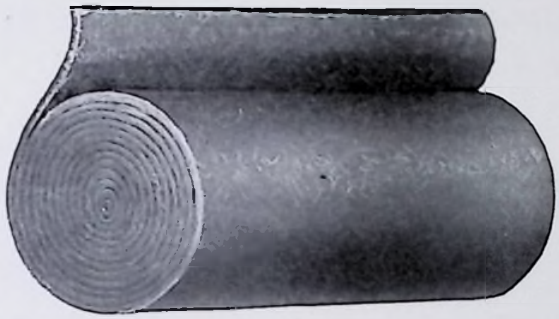
The uses of Johns-Manville Asbestos paper are large and varied; in general, it is used as a fire retardant. Its thinness makes it necessarily less efficient as an insulator than either Johns-Manville Asbestocel in flexible roll form or Johns-Manville Roll Fire-Felt, and in order to obtain appreciable insulation effect if used for that purpose, several wraps are necessary. Prices on application.

Approximate Weight per 100 square feet	Approximate Thickness Inches
ASBESTOS PAPER:	
6 pounds	.015
8 pounds	.018
10 pounds	.020
12 pounds	.025
14 pounds	.028
16 pounds	1/32
38 pounds	1/16
ASBESTOS ROLL BOARD:	
53 pounds	3/32
68 pounds	1/8



Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 41 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/41

Johns-Manville Standard Hair Felt



HAIR FELT, used for lining refrigerators, refrigerator-cars and ice-houses, is also widely used in connection with insulation for hot-water pipes, or for the protection of cold-water pipes against freezing.

It is made from selected cattle hair by an improved felting process. It is put up in bales 6 feet wide, containing 300 square feet, but can be furnished 3 feet wide, if desired, without extra charge.

List Prices and Approximate Weights

Thickness	Price Per Sq. Ft.	Weight Per Sq. Ft.	Weight Per Bale
¼ Inch	$0.05½	4 Ounces	75 Pounds
½ "	.06½	6 "	112½ "
¾ "	.08½	9 "	170 "
1 "	.10	12 "	225 "
1½ Inches	.15	18 "	337 "
2 "	.19	24 "	450 "

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 42 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/42

Johns-Manville Insulation

For Insulating

Dry Rooms and Kilns, Ceilings, Smoke Flues, Etc.

A GREAT amount of heat is lost if dry rooms, kilns, etc., are not properly constructed or insulated (see table showing loss of heat from hot surfaces, page 138, Appendix).

If materials of a low heat conductivity are used in such construction or if kilns that have been built of brick or wood are properly insulated this loss can be greatly reduced.

Frequently unenclosed coils are used for drying or some manufacturing process and while a portion of the heat does useful work, a large percentage escapes and is not only wasted but raises the temperature of the room or building to a point which decreases the efficiency of the workmen. In many cases this unconfined and unused heat is actually thrown out-of-doors by ventilating fans.

If such coils or similar apparatus were enclosed by a structure made of materials with a high insulating value, this loss would be greatly reduced.

In nearly all cases structures built of Johns-Manville insulating materials are lighter in weight than if built of materials ordinarily used in building construction. This fact eliminates the necessity of re-enforcing building construction.

As temperature, humidity and other conditions must always be taken into consideration when selecting insulating materials for purposes of this kind, we advise that such problems be taken up with our nearest branch who will have a competent representative visit your plant and make recommendations.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 43 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/43

What Insulation Efficiency Means

The efficiency of insulating material is expressed by a percentage, which is the per cent of heat saved by using the insulation, as compared to what would be lost if no insulation were used and the surface left bare or uninsulated.

The efficiency of all insulations varies according to the temperature difference between the surface and the surrounding air, as well as according to the thickness of the insulation.

Complete information regarding the use of efficiency tables, with example to illustrate will be found on pages 42 and 132.

For table showing the total heat lost from bare surfaces, see page 133.

Efficiencies of Johns-Manville Asbesto-Sponge Felted Sheets and Blocks

Thickness of Insulation	Temperature Difference between Hot Surface and Surrounding Air									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
1 "	82.90%	84.17%	85.42%	86.50%	87.50%	88.38%	89.28%	90.10%	90.92%	91.73%
1½"	87.88	88.77	89.67	90.44	91.15	91.78	92.40	92.98	93.56	94.14
2 "	90.64	91.32	92.00	92.61	93.12	93.61	94.10	94.55	95.00	95.44
2½"	92.36	92.91	93.46	93.96	94.39	94.79	95.19	95.55	95.91	96.28
3 "	93.54	94.02	94.49	94.90	95.25	95.59	95.92	96.23	96.54	96.85

Efficiencies of Johns-Manville 85% Magnesia Blocks

Thickness of Insulation	Temperature Difference between Hot Surface and Surrounding Air									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
1 "	80.80%	82.36%	83.90%	85.25%	86.48%	87.60%	88.70%	89.64%	90.56%	91.48%
1½"	86.25	87.40	88.53	89.49	90.37	91.16	91.94	92.65	93.32	93.97
2 "	89.32	90.16	91.08	91.85	92.53	93.12	93.71	94.27	94.80	95.31
2½"	91.19	91.95	92.69	93.32	93.87	94.38	94.87	95.31	95.73	96.14
3 "	92.55	93.22	93.83	94.37	94.82	95.25	95.67	96.06	96.40	96.75

Efficiencies of Johns-Manville Fine Corrugated Asbestocel Sheets and Blocks

Thickness of Insulation	Temperature Difference between Hot Surface and Surrounding Air									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
1 "	80.85%	82.08%	83.29%	84.39%	85.40%	86.30%	87.22%	88.08%	88.93%	89.79%
1½"	86.29	87.20	88.09	88.85	89.56	90.21	90.86	91.46	92.06	92.67
2 "	89.33	90.02	90.70	91.32	91.84	92.34	92.84	93.32	93.80	94.29
2½"	91.28	91.84	92.39	92.86	93.33	93.73	94.13	94.52	94.91	95.31
3 "	92.60	93.09	93.56	93.98	94.34	94.69	95.03	95.36	95.67	95.98

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 44 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/44

Efficiencies of Johns-Manville Coarse Corrugated Asbestocel Sheets and Blocks

Thickness of Insulation	Temperature Difference between Hot Surface and Surrounding Air									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
1 ".....	79.88%	81.15%	82.43%	83.50%	84.40%	85.23%	86.05%	86.83%	87.59%	88.36%
1½".....	85.62	86.49	87.36	88.12	88.79	89.37	89.95	90.51	91.05	91.59
2 ".....	88.77	89.50	90.16	90.74	91.25	91.69	92.13	92.55	92.98	93.42
2½".....	90.72	91.35	91.93	92.39	92.78	93.16	93.54	93.88	94.22	94.57
3 ".....	92.15	92.66	93.17	93.55	93.90	94.20	94.51	94.79	95.08	95.38

Efficiencies of Johns-Manville Thermo Fire-Felt Sheets and Blocks

Thickness of Insulation	Temperature Difference between Hot Surface and Surrounding Air									
	50°	100°	150°	200°	250°	300°	350°	400°	450°	500°
	Per Cent Efficiencies									
1½".....	78.70%	80.55%	82.30%	83.80%	85.10%	86.27%	87.42%	88.48%	89.50%	90.50%
2 ".....	83.27	84.64	86.00	87.18	88.20	89.14	90.08	90.92	91.73	92.51
2½".....	86.09	87.23	88.37	89.39	90.27	91.03	91.79	92.48	93.17	93.82
3 ".....	88.14	89.08	90.02	90.92	91.66	92.33	93.00	93.57	94.17	94.72

The above efficiencies are based on the application of sheets to flat surfaces. They are approximately correct however for curved surfaces, curved to large radius, such as boiler drums, tanks, etc.

Example

1. What is the efficiency of Johns-Manville Asbesto-Sponge Felted Pipe Insulation 3 inches thick to be applied on a surface at a temperature of 450° F. in a room where temperature is 70° F.?

The temperature difference is 450° F.
−70° F.

Difference 380° F.

2. Refer to Table of Efficiencies for Asbesto-Sponge Felted Insulation on Page 41.

Efficiency for 400° F. temperature difference is 96.23%
350° F. temperature difference is 95.92%

(subtract) 0.31%

If difference for 50° F. is .31% then for 1°, difference is .31% ÷ 50 = .006%.

The difference you have (380°) is 30° more than 350, so 30 × .006% = .18%, which added to 95.92% = 96.1%, the required efficiency.

If you desire to find exactly how much heat is saved by applying this heat insulation, proceed as follows:

1. Refer to table giving total heat loss in B.t.u. per square foot of bare surface (Page 133.)

Under temperature difference 400°, you find loss is 1614.0 B.t.u. per hour, and under 350° difference loss is 1269.4. The difference in loss for the 50° difference is 1614.0 − 1269.4 = 344.6 B.t.u., and for one degree difference it is 344.6 ÷ 50 = 6.89.

The difference you have (380°) is 30° more than 350, so 30 × 6.89 = 206.7 B.t.u., which added to 1269.4 = 1476.1 B.t.u., the required total heat loss from one square foot of bare surface per hour.

Having obtained the loss for bare surface, the saving effected by the 3" Asbesto-Sponge Felted Insulation is obtained by multiplying the total loss, 1476.1 B.t.u., by the efficiency of the insulation formerly found (96.1%) or 1418.4 B.t.u. saved per square foot per hour.

This result may be compared with the quantities of heat saved by other forms or thicknesses of insulation, which quantities may be obtained in similar manner to the above.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920) Published by AsbestosClaims.Law
ACL Doc 21286 · Page 45 of 154 asbestosclaims.law/library/21286/45

Johns-Manville Sheets and Blocks, Approximate Weights and Standard Sizes

Material	Standard Sizes	Thickness	Lbs. per Sq. Ft.
Asbesto-Sponge Felted Sheet	24″ x 36″	1″	3.5
85% Magnesia Blocks	3″ x 18″ and 6″ x 36″	1″	1.4
Vitribestos Sheet	36″ x 72″	½″	.88
" "	36″ x 72″	¾″	1.3
" "	36″ x 72″	1″	1.8
" "	36″ x 72″	1¼″	2.2
" "	36″ x 72″	1½″	2.6
" "	36″ x 72″	2″	3.5
" "	36″ x 72″	2½″	4.4
" "	36″ x 72″	3″	5.3
Fire-Felt Sheet	6″ x 36″ and 24″ x 36″	½″	1.2
" " "	6″ x 36″ and 24″ x 36″	¾″	1.8
" " "	6″ x 36″ and 24″ x 36″	1″	2.3
" " "	6″ x 36″ and 24″ x 36″	1¼″	2.9
" " "	6″ x 36″ and 24″ x 36″	1½″	3.5
" " "	6″ x 36″ and 24″ x 36″	2″	4.4
" " "	6″ x 36″ and 24″ x 36″	2½″	6.2
" " "	6″ x 36″ and 24″ x 36″	3″	7.0
Thermo Fire-Felt Sheet	24″ x 36″	1½″	3.5
" " " "	24″ x 36″	2″	4.5
Vitro Fire-Felt Sheet	24″ x 36″	1½″	3.8
" " " "	24″ x 36″	2″	4.8
Air-Cell Sheet 4-Ply to the inch	6″ x 36″ and 36″ x 36″	1″	1.0
Asbestocel Sheet 4-Ply to the inch	6″ x 36″ and 36″ x 36″	1″	1.0
Asbestocel Sheet 6-Ply to the inch	6″ x 36″ and 36″ x 36″	1″	1.3
Asbestocel Sheet Flexible Roll Form	36″ wide in rolls of about 250 sq. ft.	1-ply	.25
Roll Fire-Felt	36″ " " " " " 100 "	1/16″	.38
" " "	36″ " " " " " 100 "	1/8″	.59
" " "	36″ " " " " " 100 "	3/16″	.75
" " "	36″ " " " " " 100 "	¼″	1.2
" " "	36″ " " " " " 100 "	⅜″	1.5

List Prices on Sheets and Blocks
Subject to Discount

Asbesto-Sponge Felted, 85% Magnesia, Vitribestos, Asbestocel, Fire-Felt, Thermo Fire-Felt, Vitro Fire-Felt and Air-Cell.

Thickness Inches	Price per Sq. Ft.	Thickness Inches	Price per Sq. Ft.
1/16″	$ .27	2 1/16″	$ .64
1/8″	.27	2 1/8″	.68
3/16″	.30	2 3/16″	.72
1″	.30	2 ¼″	.75
1 1/16″	.34	2 5/16″	.79
1 ⅛″	.38	2 ⅜″	.83
1 3/16″	.42	2 7/16″	.87
1 ¼″	.45	3″	.90
1 5/16″	.49	3 ¼″	.98
1 ⅜″	.53	3 ½″	1.05
1 7/16″	.57	4″	1.20
2″	.60		

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 46 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/46

Johns-Manville Insulating Cements

JOHNS-MANVILLE Insulating Cements are composed of asbestos and binding materials that are low conductors of heat or efficient insulators. They are applied, when mixed with water, in plastic form, forming an efficient insulation when dry.

They are generally used as a surface finish over block or sheet forms of insulation to seal all joints between the blocks and to provide a smooth, attractive finish or a surface to which canvas may be applied if desired.

Johns-Manville Insulating Cements are also especially adapted for insulating irregular surfaces where it would be impracticable to apply sectional insulation, sheets or blocks.

Johns-Manville Fire-Felt Asbestos Insulating Cement No. 302

Johns-Manville Asbestos Insulating Cement No. 302 is made of asbestos fibre and binding materials that have high insulating values. It is easy to mix and apply, and readily adheres to hot surfaces. As it is light in weight and high in insulating value, No. 302 is one of the most economical insulating cements manufactured.

Johns-Manville Asbestos Insulating Cement No. 302 finishes with a hard, durable and attractive surface, and does not crack, break or peel off.

Packed in 100 and 120-pound bags.

Johns-Manville Asbestos Insulating Cement No. 400

Johns-Manville Asbestos Insulating Cement No. 400 is a combination of asbestos and other materials of high insulating value. It is an ideal insulating cement for general use where efficiency, strength and durability are desired. Besides its high efficiency, it provides a smooth, durable finish.

Packed in 100-pound bags.

Other Johns-Manville Insulating Cements

Johns-Manville manufactures and is prepared to furnish 85% Magnesia Insulating Cement, also Johns-Manville No. 364 and No. 352 Cements. The latter two cements are not as high in insulating value as the cements referred to above and are generally used where a less expensive material is required.

The efficiencies of insulating cements cannot be given in definite figures because the efficiency of a given cement may vary greatly according to the manner of application, the form of the surface on which it is applied, etc. However, it may be said that for the better grades of insulating cements applied one inch thick on flat surfaces and at temperatures corresponding to average high pressure steam conditions (about 150 lbs.), the efficiencies vary approximately from 70% to 85%.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 47 of 154
asbestosclaims.law/library/21286/47

Johns-Manville Undergound System of Insulation

for Pipes Conveying Steam and Hot Water

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 48 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/48

The Johns-Manville Underground System of Insulation in Course of Installation

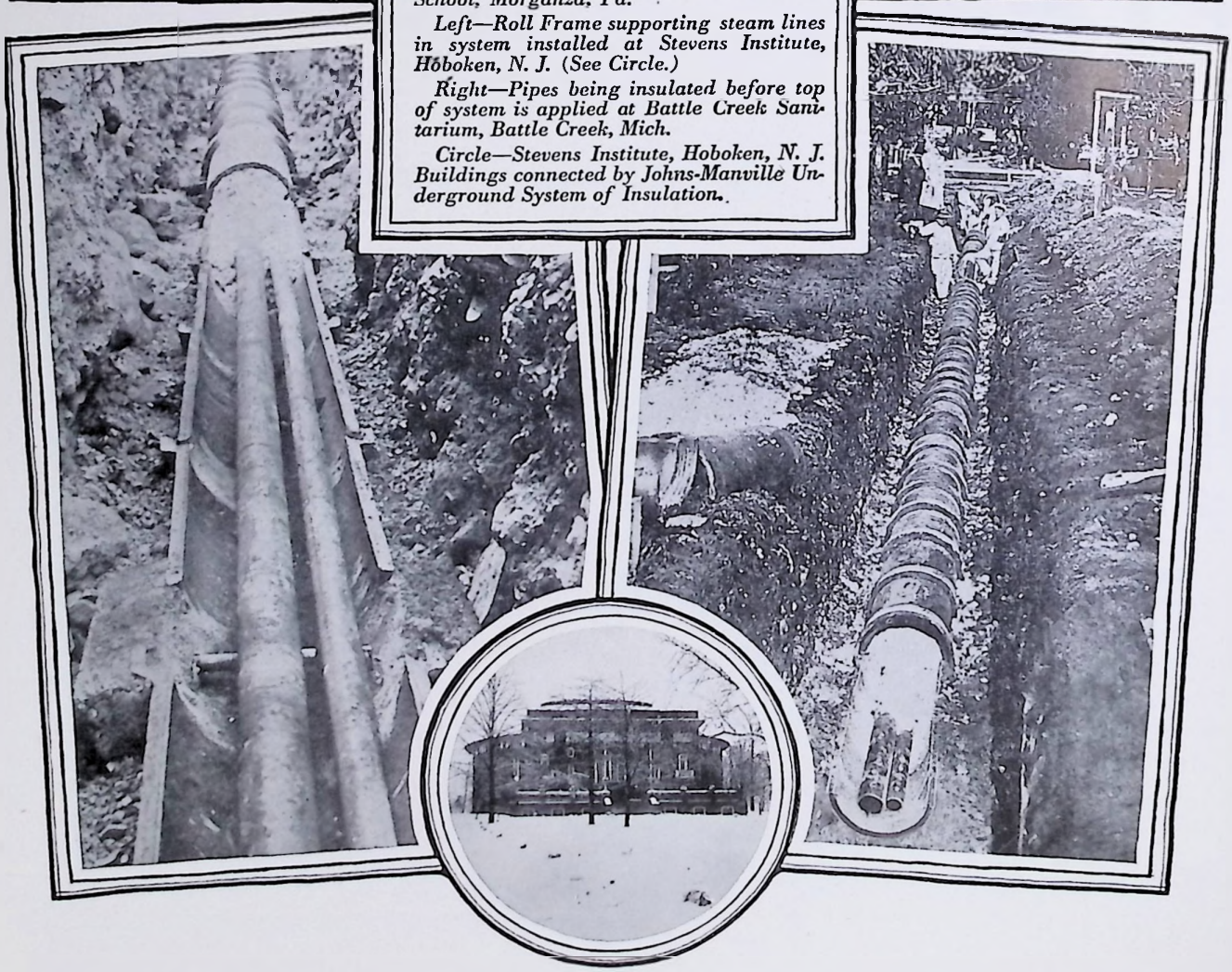


Top—Sections being split before being placed in trench at the Pennsylvania Reform School, Morganza, Pa.

Left—Roll Frame supporting steam lines in system installed at Stevens Institute, Hoboken, N. J. (See Circle.)

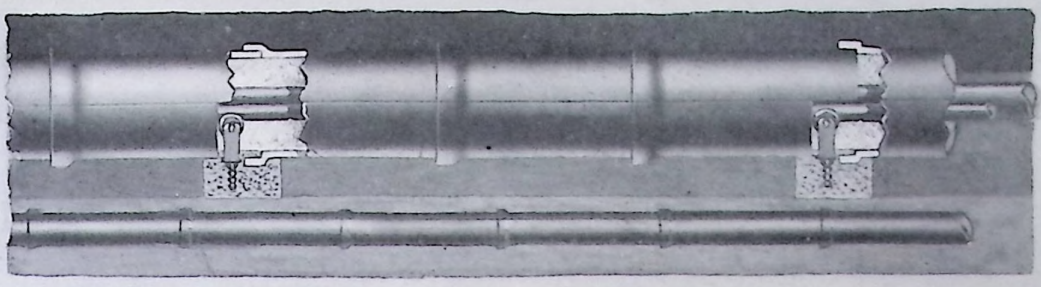
Right—Pipes being insulated before top of system is applied at Battle Creek Sanitarium, Battle Creek, Mich.

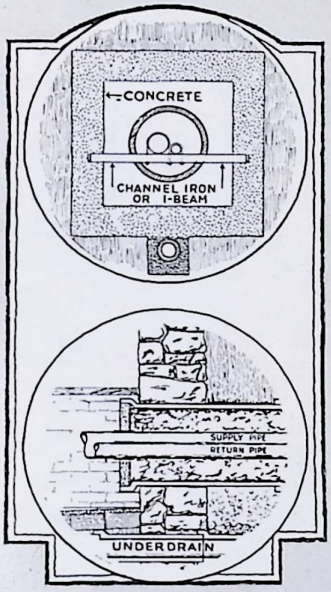
Circle—Stevens Institute, Hoboken, N. J. Buildings connected by Johns-Manville Underground System of Insulation.



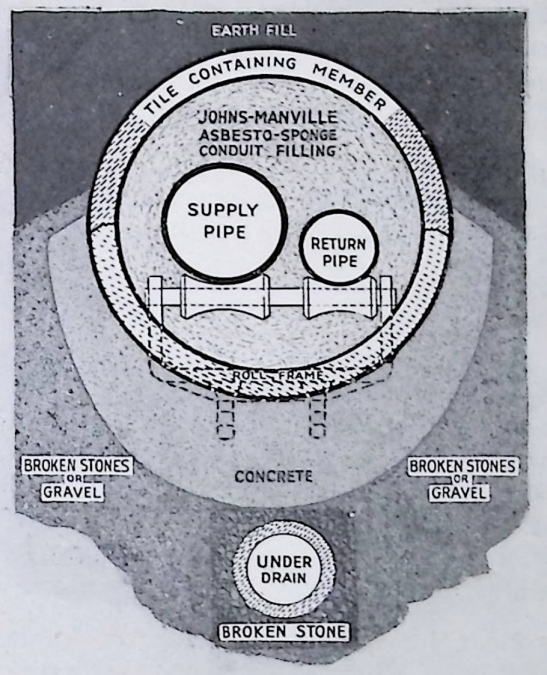
Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 49 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/49

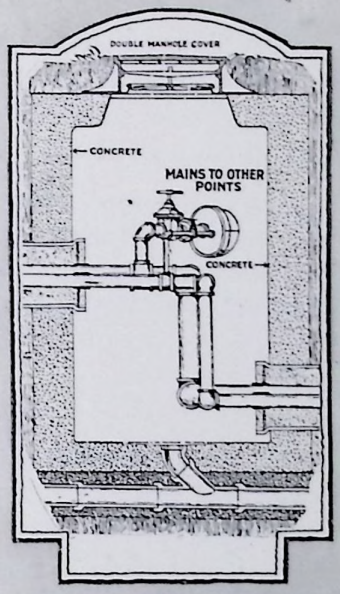
The Johns-Manville Underground System of Insulation for Steam and Hot Water Pipes



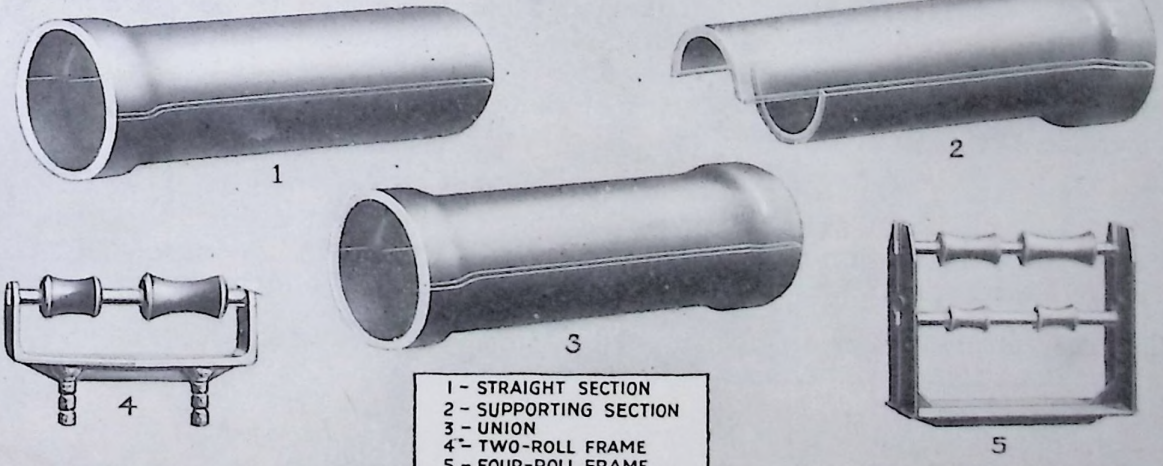


TOP – ANCHOR PIT – SOMETIMES CALLED A BLIND PIT
BOTTOM – SECTION THROUGH SHUTTER ILLUSTRATES PIPES ENTERING BUILDING





SECTION SHOWING METHOD OF CONSTRUCTION AT MANHOLE



1 – STRAIGHT SECTION
2 – SUPPORTING SECTION
3 – UNION
4 – TWO-ROLL FRAME
5 – FOUR-ROLL FRAME

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 50 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/50

The Johns-Manville Underground System of Insulation for Steam and Hot Water Pipes

THE Johns-Manville Underground System of Insulation provides a permanent, efficient and economical means of placing underground and insulating pipes conveying steam or hot water.

The system comprises not only the integral parts shown on the preceding page but the proper selection and arrangement of these parts and the installation or supervision of installation of them by Johns-Manville Engineers.

The efficiency of the Johns-Manville system is at least 90% when installed according to our specifications and by us or under our supervision. This high efficiency is maintained for a long period of time on account of the character of the materials that are used in the construction of the system.

Insulating Material Used

For the base of the insulating material which surrounds the pipes we chose asbestos—a natural rock, unchanged by high temperatures, and immune from water, wear, rot and rust. To provide for maximum insulating efficiency we combined specially selected fibres of this asbestos rock with other material of a sponge-like nature which, when properly mixed with asbestos fibre, forms the most efficient and most durable insulating material for underground work—Johns-Manville Asbesto-Sponge Filling.

The high and lasting heat insulating efficiency of Johns-Manville Asbesto-Sponge Filling is due to the many "dead air" spaces and cells which it confines, and to its base of indestructible asbestos fibre. When packed around the pipe to be insulated, it completely fills the space inside of the protecting and containing parts of the system. It is extremely resilient and spongy, so that there is no tendency for it to settle. Nor is its durability affected by moisture. Even if it becomes soaked with water, when dried out, it is as efficient as before.

The fact that Johns-Manville Asbesto-Sponge Filling maintains its high initial heat insulating efficiency year after year without the slightest depreciation makes it the most economical insulation possible to use for this work. Its saving of heat does not diminish as time goes on, and it is the "cheapest-per-year" of all underground insulations.

The correct amount and thickness of this insulation has been accurately determined for various conditions by the most rigid tests.

Supporting Roll Frame

The Johns-Manville Supporting Roll Frame has been designed to provide support for the pipes and to insure that they may move freely when expanding and contracting.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 51 of 154
asbestosclaims.law/library/21286/51

This roll frame, anchored in a concrete base, supports the entire weight of the pipes and their contents and prevents any load from being carried by the containing and protecting member. The movements of the pipes due to expansion and contraction, thus produce no effect on the system. This method of support is sufficient to bear any weight required of it in service, and is obtained without leaving or causing openings which may admit water.

Johns-Manville Roll Frames are designed and made according to the number and combination of pipes that may be contained in the conduit.

Supporting Sections

The supporting section of the system is a most important part as it completely covers and encloses the roll frame and the concrete base in which the roll frame is enclosed and also acts as a connecting link between the containing sections.

Containing Sections

The supporting sections are connected by containing sections, which complete the continuous stone protective member which surrounds the entire system and acts as a container for the Asbesto-Sponge Filling.

The sections are split diagonally, so that the lateral joints will shed water better than if the cut of the joint were straight, and each half of every section is numbered so that in the installation of the system mates of each section will always be together.

Underdrain

While the efficiency of the insulating member of the system is not impaired even if it becomes wet and subsequently dried out, and while this member is completely enveloped in the stone protective container, which is absolutely waterproof, provision is also made to prevent water from accumulating around the system and to drain or carry it away, by the use of an underdrain of small tile pipe laid with open joints and imbedded in crushed stone, which is carried up and around the system to a point above the lateral joints.

The design and proper location of anchors, anchor-pits, manholes and manhole covers are details carefully worked out by our engineers according to conditions.

Manholes or pits are used as required by the nature of the installation. In a small installation there is no call for a large manhole, as the pipes may be anchored or a branch may be taken off in a small pit (commonly called a blind pit) to which no ready means of access is necessary.

Wherever there may be valves, expansion joints, flanged joints, or other features which it may be desirable or necessary to get at occasionally, and which cannot be placed in a building into which the system runs, a manhole with a removable but water-tight cover should be employed.

Where any part of the system terminates, whether at a building, anchor-pit or manhole, the ends are sealed in by specially designed shutters.

A guarantee of an efficiency of not less than 90% is given when the system is installed by Johns-Manville in accordance with their standard practice.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 52 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/52

Specifications for Steam and Hot Water Pipes to Be Installed Underground

ALL steam lines and returns and all hot water lines that run outside of power plant or buildings shall, as indicated, be run underground and insulated by the H. W. Johns-Manville System of Underground Insulation.

2. This system shall consist of:

(a) Roll frames and rolls for the support of piping.
(b) Supporting sections for the enclosure and support of the roll frames.
(c) Straight sections and unions for the connections between supporting sections and buildings or pits.
(d) Johns-Manville Asbesto-Sponge Filling for the insulation of the pipes.
(e) Underdrain for drainage of system.
(f) Broken stone or gravel of suitable size for surrounding lower half of system.
(g) Shutters to seal the ends of the system where it terminates in buildings, manholes or pits.
(h) Manholes and anchor pits to be provided as indicated to allow for control of expansion and contraction or for changes in direction or elevation of the system.
(i) Suitable covers for manholes.

The system complete and when installed shall provide for the support of pipe or pipes at proper intervals, so that neither the weight of the pipe nor the movement of same due to expansion or contraction will cause strain or stress to come on the tile containing members of the system.

The containing members, items B and C, paragraph 2, shall be of a size that will provide not less than three inches of space for insulation between the top of pipe or pipes and the nearest point of the containing member, and between the side of pipe or pipes and nearest point of containing member. The space referred to, to be measured between the outside surface of the pipe and inside surface of the containing member.

The supporting sections shall be so designed and made as to provide a suitable concrete base extending from the broken stone or gravel bedding, under the containing members, up through the special opening to the interior of the containing members, and the roll frames are to be set into these bases when they are built.

The entire space in the containing member not occupied by pipe, rolls and roll frames to be filled with Asbesto-Sponge Filling, a proper combination of asbestos and suitable material of a spongy nature.

And the completed system to effect an efficiency of not less than 90% and subject on completion to proof under a condensation test described hereafter if required.

Efficiency is understood to mean ratio of saving effected by insulation to bare pipe loss. The basis of bare pipe loss to be taken from McMillan's University of Wisconsin tests, Transactions of A.S.M.E., Volume 37, page 941, or Mechanical Engineers' Handbook, by Professor L. S. Marks, page 841.

Material

3. All material listed under items a to e inclusive, and item i, paragraph 2, to be furnished by the H. W. Johns-Manville Company.

4. Material listed under items f, g and h, paragraph 2, to be furnished by party agreed upon and stipulated hereafter.

Supervision of Installation

5. The H. W. Johns-Manville Company shall furnish a representative capable of supervising the installation of the system above described and all work done by the labor required to install the system is subject to the approval of the Johns-Manville representative, whether said labor be furnished by the Johns-Manville Company or otherwise, as stipulated hereafter.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 53 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/53

Labor

6. All labor and tools required for the digging of trenches for the system, the handling of broken stone or gravel, the back-filling of trenches after the insulation of piping has been completed, and for the actual installation of the various parts of the system, shall be furnished by the party or parties stipulated hereafter.

Note to Architect or Engineer specifying—When possible we advise consultation with our engineering department at our branch in whose territory you may be located, regarding the selection of party or parties referred to in paragraphs 4, 5 and 6,—as local conditions, the size of the installation, and the location of same have much to do with the selection of parties best qualified to handle various parts of the installation. Whenever possible we recommend and desire to furnish our own men as well as a superintendent to install all items a to g inclusive, paragraph 2, but there may be exceptions such as the installation of systems at some distant or out of the way place or at some institution that desires to furnish its own labor. In all cases, however, the installation of our system must be under our supervision.

Levels and Lines

7. Unless otherwise agreed, levels and lines for laying the system to true and proper grade shall be furnished by the steamfitter or owner.

The Installing or Laying of Pipes to be Insulated

8. It is to be understood by the steam-fitter or contractor who is to furnish and install the piping to be insulated by the Johns-Manville System, that no flanges, companion flanges or flanged fittings are to be used where pipe is surrounded by the underground insulation, and that all such connections are to be made with extra-heavy screw couplings or welded connections according to heating or steam-piping specifications covering that work.

Furthermore the piping shall be placed and connected on rolls, as they are provided, by party installing same. As soon as said rolls have been installed and are ready for the pipe—and before the Asbesto-Sponge Filling and top halves of the system are in place—the steam-fitter or contractor placing the piping shall subject the pipe placed to a hydrostatic test mutually agreed upon by the owner and the Johns-Manville Company.

In case of any leaks or defects developing when pipe is subject to test, such repairs or replacements as are satisfactory to the Johns-Manville Company are to be made before the system is insulated and the top halves applied.

All pipes to be anchored with suitable anchoring devices furnished by the steamfitter and proper provision made for expansion as shown in plans and specifications.

Where pipes are run through walls or through shutters—item g, paragraph 2—where the system or part of same begins and terminates, the steam-fitter shall furnish and place around pipe, sleeves made of the next size of pipe that may be slipped over pipe to be insulated, and these sleeves shall be of such a length as to extend entirely through wall or shutter and from two to four inches beyond each side of wall or shutter.

Test for Efficiency

9. The test to sustain specified guarantee, paragraph 2, shall be a condensation test, approved by the engineer of the buyer and the engineer of the seller, made with live steam for a period of not less than four hours. Previous to the test, steam shall have been on the system at least twenty-four hours. Due corrections will be made for the losses not properly chargeable to the insulation, such as uncovered fittings, valves, etc.

Note to Architect or Engineer specifying—Next and lastly, stipulate party or parties to provide labor and materials mentioned in paragraphs 4, 5 and 6.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 54 of 154
asbestosclaims.law/library/21286/54

A Few Prominent Users of Johns-Manville Underground System of Insulation

Canadian

McGill University, Montreal, Que.
Canadian Pacific Railway, Montreal, Que.
Canadian Sugar Refining Co., Montreal, Que.
Imperial Tobacco Co., Montreal, Que.
Imperial Tobacco Co., Granby, Que.
St. Maurice Pulp & Paper Co., Three Rivers, Que.
Normal School, Granby, Que.

New England States

Connecticut Hospital for Insane, Middletown, Conn.
Pratt & Whitney, Hartford, Conn.
Westover School, Middlebury, Conn.
Norwich Insane Hospital, Norwich, Conn.
Scoville Mfg. Co., Waterbury, Conn.
Thread Agency, Willimantic, Conn.
Groton School, Groton, Conn.
Wesleyan University, Middletown, Conn.
Connecticut School for Feeble Minded, Mansfield, Conn.
Connecticut Colony for Epileptics, Mansfield, Conn.
Taft School, Watertown, Conn.
American Brass Co., Ansonia, Conn.
Wm. Ziegler Residence, Noroton, Conn.
American Brass Co., Waterbury, Conn.
Franklin S. Jerome, Greenwich, Conn.
Bates College, Lewiston, Me.
University of Maine, Orono, Me.
Grand Trunk Railway, Portland, Me.
International Y. M. C. A. College, Springfield, Mass.
Amherst College, Amherst, Mass.
Mt. Holyoke College, So. Hadley, Mass.
Andover Theological Seminary, Andover, Mass.
Mass. Agri. College, Amherst, Mass.
Mt. Hermon School, Mt. Hermon, Mass.
Northfield Seminary, Northfield, Mass.
Phillips Academy and Abbot Academy, Andover, Mass.
Wellesley College, Wellesley, Mass.
Williams College, Williamstown, Mass.
Liquid Carbonic Co., Cambridge, Mass.
Vacuum Oil Co., East Cambridge, Mass.
Middlesex School, Concord, Mass.
Boston State Hospital, Dorchester, Mass.
Grafton State Hospital, Grafton, Mass.
Newton Theological Seminary, Newton, Mass.
Holy Cross College, Worcester, Mass.
St. Michael's Cathedral and School Association, Springfield, Mass.
Wheaton College, Norton, Mass.
Mass. Hospital for Epileptics, Palmer, Mass.
Danvers Insane Asylum, Danvers, Mass.
Mary McClellan Hospital, Cambridge, Mass.
New Hampshire College, Durham, N. H.
Dartmouth College, Hanover, N. H.
Phillips Exeter Academy, Exeter, N. H.
Proctor Academy, Andover, N. H.
City of Franklin, Franklin, N. H.
St. Mary's Church Parish, Providence, R. I.
The Brown & Sharp Mfg. Co., Providence, R. I.
R. I. School for Feeble Minded, Exeter, R. I.
State Hospital, Howard, R. I.
Church of Our Lady of Good Counsel, Phoenix, R. I.
Middlebury College, Middlebury, Vt.
Vermont Hospital for Insane, Waterbury, Vt.
Brattleboro Retreat, Brattleboro, Vt.

Middle Atlantic States

American Vulcanized Fibre Co., Newark, Del.
Winterthur Farms, Winterthur, Del.
U. S. Dept. of Agriculture, Washington, D. C.
Catholic University, Washington, D. C.
Drew Theological Seminary, Madison, N. J.
East Orange High School, Orange, N. J.
St. Joseph's Hospital, Paterson, N. J.
Princeton Theological Seminary, Princeton, N. J.
Monmouth Memorial Hospital, Long Branch, N. J.
Montclair Schools, Montclair, N. J.
Princeton University, Princeton, N. J.
Estate of H. McK. Twombly, Madison, N. J.
New Jersey State Home for Girls, Trenton, N. J.
U. S. Govt. Proving Grounds, Sandy Hook, N. J.
Eastwood Wire Mfg. Co., Belleville, N. J.
Eastern Coal Dock Co., South Amboy, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Long Branch Schools, Long Branch, N. J.
Baker Castor Oil Works, Jersey City, N. J.
Morris Avenue Schools, Long Branch, N. J.
Tuberculosis Preventorium, Farmingdale, N. J.
Boonton Rubber Co., Boonton, N. J.
Forstmann & Huffmann Co., Garfield, N. J.
Montclair Normal School, Montclair, N. J.
Singer Mfg. Co., Elizabethport, N. J.
Standard Underground Cable Co., Perth Amboy, N. J.
Merck & Co., Rahway, N. J.
Stevens Institute of Technology, Hoboken, N. J.
St. Mary's Hospital, Orange, N. J.
Municipal and County Buildings, New York City, N. Y.
Metropolitan Hospital, Blackwell's Island, N. Y.
U. S. Navy Yard, Brooklyn, N. Y.
General Elec. Co., Schenectady, N. Y.
Manhattan State Hospital, Ward's Island, N. Y.
U. S. Government Arsenal, Watervleit, N. Y.
Burke Relief Foundation, White Plains, N. Y.
Kings Park State Hospital, Kings Park, N. Y.
Troy Orphan Asylum, Troy, N. Y.
C. O'D. Iselin, New Rochelle, N. Y.
Hebrew Sheltering Society, Pleasantville, N. Y.
Bloomingdale Hospital, White Plains, N. Y.
New York State Reform School for Girls, Bedford Hills, N. Y.
New York State Agricultural College, Farmingdale, L. I., N. Y.
New York State Hospital, Gowanda, N. Y.
New York State School for Girls, Hudson, N. Y.
Letchworth Village, Thiells, N. Y.
Central Islip State Hospital, Central Islip, N. Y.
City Farm Colony, Staten Island, N. Y.
Louis C. Tiffany Residence, Oyster Bay, N. Y.
Samaritan Hospital, Troy, N. Y.
New York State Soldiers' Home, Bath, N. Y.
Vassar College, Poughkeepsie, N. Y.
Vassar Brothers Hospital, Poughkeepsie, N. Y.
Cornell University, Ithaca, N. Y.
United Gas Improvement Co., Philadelphia, Pa.
Wayne Elec. Light & Steam Heat Co., Wayne, Pa.
Penn. Institution for the Deaf and Dumb, Mt. Airy, Pa.
Vanadium Hotel, Cambridge Springs, Pa.
White Haven Sanitarium, White Haven, Pa.
Muhlenberg College, Allentown, Pa.
Presbyterian Home, Bala, Pa.
Church of Redeemer, Bryn Mawr, Pa.
Lafayette College, Easton, Pa.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 55 of 154
asbestosclaims.law/library/21286/55

Elliot Co., Jeannette, Pa.
Pennsylvania Reform School, Morganza, Pa.
Church of Nativity, Philadelphia, Pa.
Elizabeth Steel Magee Hospital, Pittsburgh, Pa.
P. H. Glatfelter, Spring Grove, Pa.
Swarthmore College, Swarthmore, Pa.
Central Station for the Town of Windber, Windber, Pa.
State Normal School, Indiana, Pa.

Southern States

West Point Mfg. Co., Fairfax, Ala.
Atlanta Baptist College, Atlanta, Ga.
A. & M. College, Raleigh, N. C.
A. J. Kennard, Roanoke, Va.
Hampton Normal & Agricultural Institute, Hampton, Va.

Central States

University of Illinois, Champaign, Ill.
American Bridge & Iron Co., Chicago, Ill.
Illinois Malleable Iron Co., Chicago, Ill.
Lincoln Park, Chicago, Ill.
Municipal Tuberculosis Sanitarium, Chicago, Ill.
Elgin, Joliet & Eastern R.R., East Joliet, Ill.
N. Y. C. R.R. Company, Englewood, Ill.
Residence of Mrs. C. H. McCormick, Lake Forest, Ill.
Barber Coleman Co., Rockford, Ill.
St. Charles School for Boys, St. Charles, Ill.
Southern Illinois State Normal School, Carbondale, Ill.
Northern Ind. Hospital for the Insane, Long Cliff, Ind.
Oliver Chilled Plow Co., South Bend, Ind.
Dodge Mfg. Co., Mishawaka, Ind.
M. Rumely Co., La Porte, Ind.
Notre Dame University, South Bend, Ind.
Studebaker Co., South Bend, Ind.
Lake Shore & Michigan Southern Ry., South Bend, Ind.
Claypool Hotel Co., Indianapolis, Ind.
St. Joseph's College, Rensselaer, Ind.
Republic Iron & Steel Co., East Chicago, Ind.
Western Drop Forge Co., Marion, Ind.
City Water & Electric Co., Mishawaka, Ind.
La Porte Gas & Electric Co., La Porte, Ind.
Marion Branch, N. H. D. V. S., Marion, Ind.
Berea College, Berea, Ky.
Western Kentucky Asylum for Insane, Hopkinsville, Ky.
Lake Superior Steam Heating Co., Iron Mountain, Mich.
Detroit United Railway Co., Detroit, Mich.
Battle Creek Sanitarium, Battle Creek, Mich.
People's Light, Heat & Power Co., Springfield, O.
City of Cleveland, Brookside Park, O.
Corrigan, McKinney & Co., Cleveland, O.
Oberlin College, Oberlin, O.
Institute for Feeble Minded, Morgens, O.
Ohio Cultivating Co., Bellevue, O.
American Textile Co., Greenfield, O.
Cuyahoga County Court House, Cleveland, O.
City of Cleveland, Cleveland, O.
Western Automatic Machine Screw Co., Elyria, O.
Toledo Furnace Co., Toledo, O.
University of Tenn., Chattanooga, Tenn.
Nashville Gas & Heating Co., Nashville, Tenn.
West Virginia Wesleyan College, Buckhannon, W. Va.
West Virginia Colored Institute, Institute, W. Va.
University of West Virginia, Morgantown, W. Va.
Welch Miners Hospital, Welch, W. Va.
Eagle Glass & Mfg. Co., Wellsburg, W. Va.
Chicago Brass Co., Kenosha, Wisc.
Dodge County Insane Asylum, Juneau, Wisc.
Milwaukee County Alms House, Wauwautosa, Wisc.
Wisconsin Condensed Milk Co., Burlington, Wisc.
Cedar Island Lodge, Lake Nebagamon, Wisc.
St. Francis Seminary, St. Francis, Wisc.
Kempsmith Mfg. Co., West Allis, Wisc.
St. John Catholic Church, Jefferson, Wisc.

Southwestern States

Missouri State Capitol, Jefferson City, Mo.
State Agricultural School, Russellville, Ark.
Colorado Springs Elec. Co., Colorado Springs, Col.
United Service Co., Colorado Springs, Col.
Pueblo Elec. Co., Pueblo, Col.
Washburn College, Topeka, Kas.
Oregon Short Line Ry., Salt Lake City, Utah.

Northwestern States

Oregon Short Line Ry., Pocatello, Idaho.
Iowa College, Grinnell, Ia.
Municipal Electric Light, Heat & Power Co., Ackley, Ia.
G. E. Reed, Davenport, Ia.
Carr-Ryder Adams Co., Dubuque, Ia.
People's Gas & Electric Co., Mason City, Ia.
Alexandria Heating Co., Alexandria, Minn.
City of Buhl, Buhl, Minn.
Montana State Hospital for the Insane, Warm Springs, Mont.
State Agricultural School, Bozeman, Mont.
House of the Good Shepherd, Helena, Mont.
State Hospital, Warm Springs, Mont.
Bozeman University, Bozeman, Mont.
State School of Mines, Rapid City, S. D.
Mobridge Electric Light, Power & Heating Co., Mobridge, S. D.
University of Wyoming, Laramie, Wyoming.

Pacific States

Alaskan Engineering Commission, Anchorage, Alaska.
Danziger Residence, Beverly Hills, Cal.
Civic Center, San Francisco, Cal.
Stanford Jr. University, Stanford, Cal.
University of Washington, Seattle, Wash.
Tacoma Gas Co., Tacoma, Wash.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 56 of 154
asbestosclaims.law/library/21286/56

Increasing America's Power Output and Decreasing Maintenance Costs

A HORSEPOWER at the cross-head costs more than one at the coal pile. All your plant charges, such as firing, oiling, superintendence, overhead, combine together to increase it.

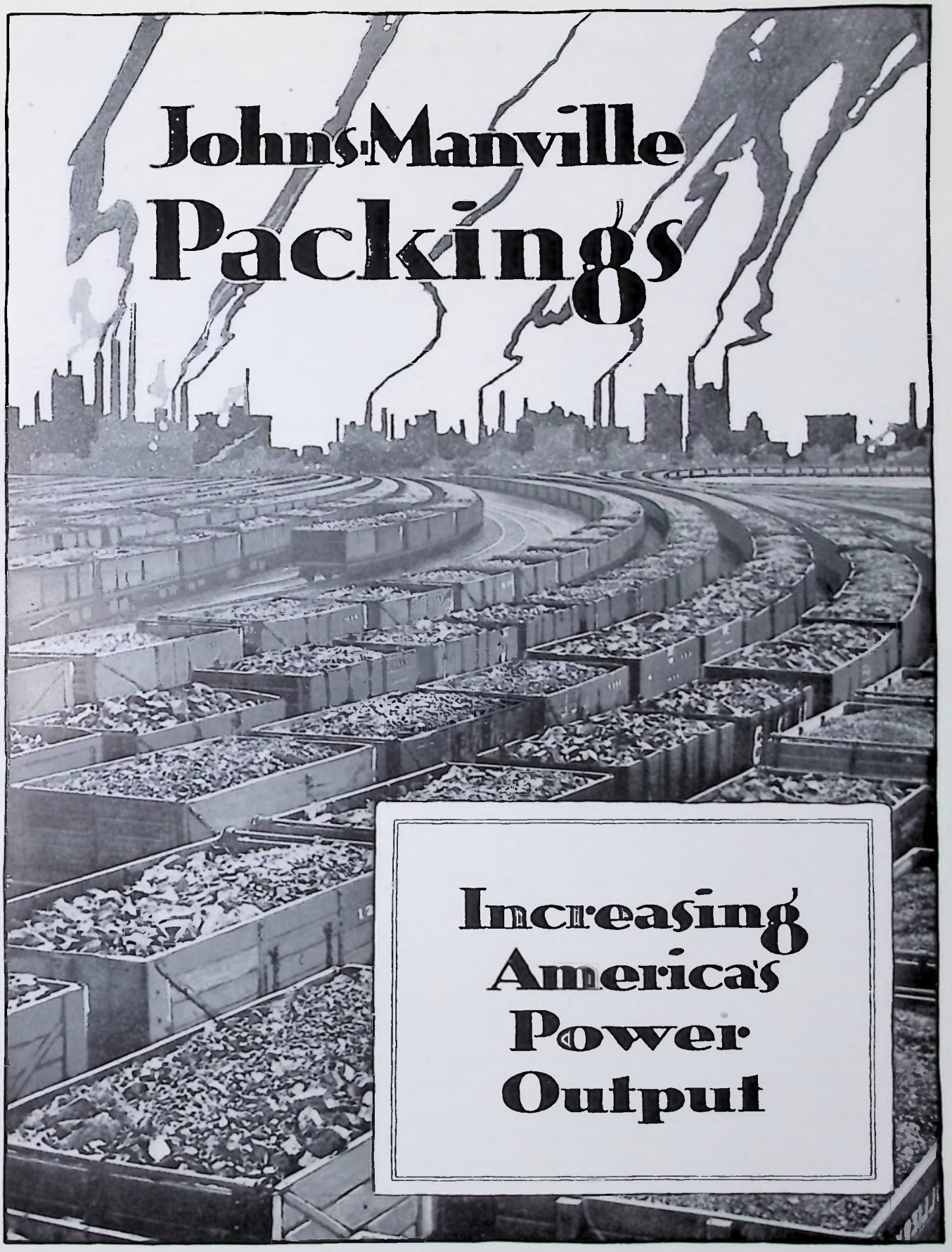
Heat unit for heat unit, power saved in steam is more worth saving than power saved in coal. And the further you go into the plant the greater is this difference—the more this is true.

So that rod friction in a pump, an engine or compressor is a sizable item. Piston leaks and flange losses are not only nuisances but costly ones. Shutdowns are worse, because production stops while expense goes on.

All of these things prove the importance of proper design and standardization in plant maintenance materials. For every horsepower conserved or released by their use is just another horsepower available for production.

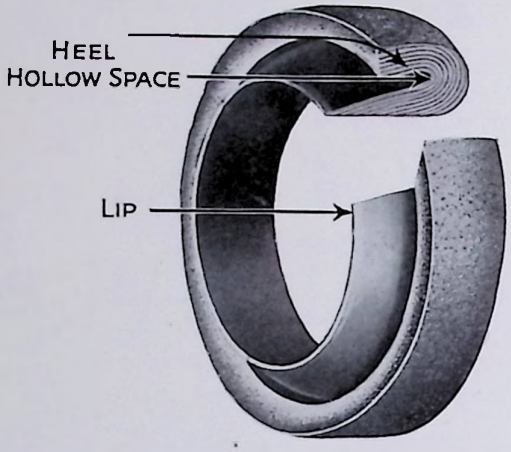
So that of all the ways—some direct, some devious—by which Johns-Manville serves the public, none is more important than this function of decreasing maintenance costs, this power economy at the very heart-center of industry.

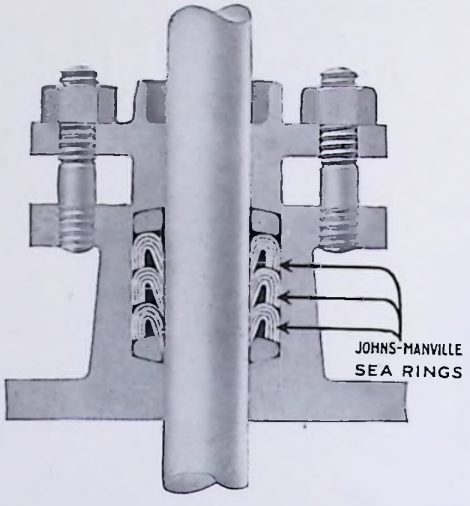
Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 57 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/57



Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 58 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/58

Johns-Manville Sea Rings





For packing rods and outside packed plungers against steam, water, air, brine and any other fluid that will not attack the materials used in constructing Sea Rings

JOHNS-MANVILLE Sea Rings are made for rods or plungers $\frac{3}{4}''$ in diameter or over, providing flange or space between rod and stuffing-box is $\frac{3}{8}''$ or more. The action of Sea Rings is absolutely automatic. They press against or grip the rod only when there is a tendency of leakage through the stuffing-box. The pressure through the box acts on the lips of the packing and in proportion to the pressure.

The elimination of unnecessary friction where Sea Rings are used means great economy, on account of the saving in power required to drive the apparatus. The data and curves shown on pages 58 and 59 conclusively prove the economy of Sea Rings even when good packing of the ordinary type may be purchased for much less.

Long life and service are obtained from Sea Ring Packing, because, by preventing unnecessary pressure and friction between rod and packing, needless wear is eliminated.

Leakage is prevented because the flexible lip more readily conforms to rod or plunger than the inside surface of an ordinary solid packing.

Loss of time and expense due to shut-downs and labor cost of renewals are reduced to a minimum, because of the durability of Sea Rings.

Sea Rings provide for Packing Standardization, i. e., the elimination of a number of packings for various conditions, because they are constructed of materials that make them the best packing obtainable for nearly all conditions encountered where rod and plunger packing is required.

Furnished in ring form only.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 59 of 154
asbestosclaims.law/library/21286/59

Sea Ring Service

IT costs more to pack a stuffing-box with Sea Rings than with any other packing—except some types of mechanical (metallic) packing.

But the service rendered by Sea Rings makes them the most economical packing to purchase and use.

This service is due to their automatic action which reduces friction to a minimum, and so reduces wear on the packing and power required to drive the rod back and forth through the packing.

Either service alone—that of long life or that of power saving—will effect sufficient saving to justify the purchase of Sea Rings. Combined, the saving afforded by Sea Rings amounts to a large return on the investment.

The life of Sea Rings depends upon the service to which they are subjected, and in drawing conclusions from test data their life should be compared to the life of other packings used under identical conditions.

The saving of power by Sea Rings is indisputable, and easily determined and checked by measuring the power required to drive a machine before and after it is packed with Sea Rings.

See chart and data on pages 58 and 59.

Some Examples of Service Rendered by Johns-Manville Sea Rings

Hot Water Service

Outside packed boiler feed pump at American Steel and Wire Consolidated Works, Cleveland:

Plungers 12″ in diameter, pumping hot water at a temperature of from 210 degrees to 212 degrees against a boiler pressure of 175 pounds.

Two sets of Sea Rings were in service on the above pump for five years.

General Sea Ring Service

At the expiration of the second year after the engineer of the Hotel St. George, Brooklyn, installed the first set of Sea Rings in his plant, every reciprocating rod has been packed with Sea Rings and there have been no replacements. This general service includes hot and cold water, steam, brine and air.

Centrifugal Pump Service

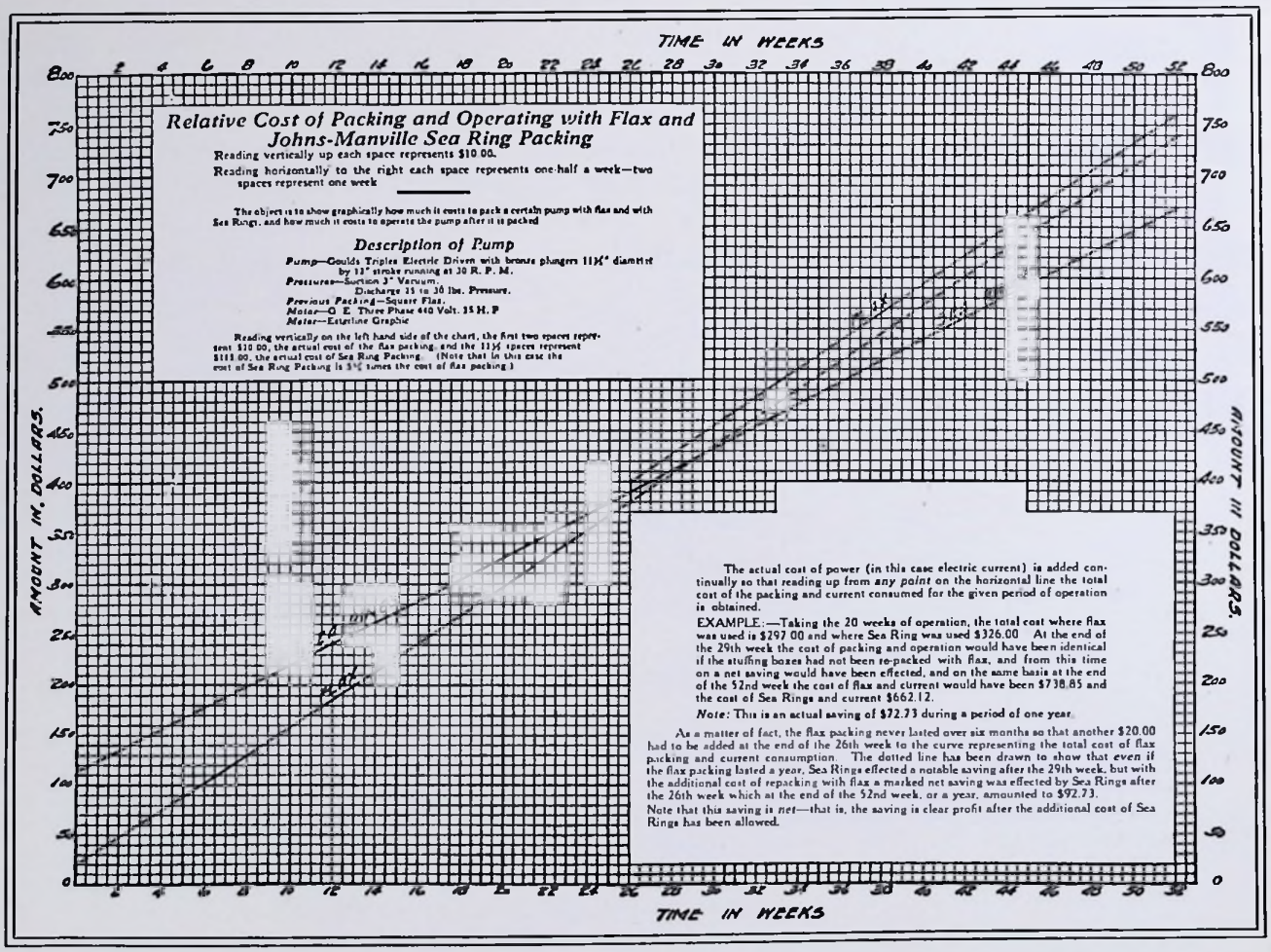
Sea Rings used on a Wilson Snyder centrifugal pump operating under varying speeds, from 750 to 1350 R.P.M., at one of the plants of a large steel company have lasted nine months and over where formerly ordinary packing used was replaced weekly, and a brass sleeve used in the stuffing-box replaced every two weeks.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 60 of 154
asbestosclaims.law/library/21286/60

Saving Power by Eliminating Friction

A TREMENDOUS amount of power is wasted in the operation of pumps, engines, compressors, etc., because the pressure of ordinary packing on a rod or plunger is always CONSTANT and maximum, irrespective of the fact that the tendency of leakage or pressure through the packing is generally VARIABLE.

Read and Understand the Chart Below



Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 61 of 154
asbestosclaims.law/library/21286/61

A Comparison

Electrical Current Consumption
Packing Costs

Following data compiled from records made during Sea Ring test at Tide Water Paper Co.

See Chart on Page 58

A — It costs $40.00 to pack a triplex electrical-driven pump with good grade braided flax for 1 year (2 packings per year at $20.00 each). *See note A.
It costs $718.85 to drive the same pump with electricity for one year 9.6 K.W. per hour, 24 hours per day—144 hours per week—7488 hours per year = 71,884.8 K.W. hours, cost 1c per K.W. hour.

B — It costs $115.00 to pack same pump with Sea Rings for 1 yr. (Sea Ring packing will last longer). *See Note B.
It costs $551.12 to drive pump with electricity, one year, same number of hours as above. (7.36 K.W. per hour. = 55,111.8 K.W. hours. at 1c per K.W. hour.)

Saving in cost of power to drive pump packed with Sea Rings for 1 year.....	$167.73
Premium paid for Sea Ring Packing (difference between cost of Sea Rings and Flax, $115.00—$40.00).....	75.00
Actual net saving first year accomplished by the use of Sea Ring Packing.....	$92.73

This is a return of 123% on the $75.00 premium paid for Sea Rings.

*Note A—Two packings of flax a year is conservative as pump was actually packed with flax every 4 months.

*Note B—These Sea Rings were put in service in November, 1917, and were still in service January 1st, 1920.

If Sea Rings last 3 years—the last two years, Sea Rings will save—

4 packings of flax at $20.00 each.....	$ 80.00
33,546 kilowatt hours at 1c each.....	335.46
Total additional net saving in 2 years.....	415.46
Net saving first year was.....	92.73
Total net saving for 3 years is.....	508.19

Also note that actual cost of Sea Rings, $115.00, is less than actual cost of 6 flax packings at $20.00 each, or $120.00

Do not overlook the fact that electrical current saved per year was 16,773 K.W. hours.

This means that the pump packed with flax consumed 30.4% more current than when packed with Sea Rings.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 62 of 154
asbestosclaims.law/library/21286/62

Directions for the Installation of Johns-Manville Sea Rings

A set of Johns-Manville Sea Rings is usually composed of one header ring, several sea rings, and one follower ring. The number of sea rings used depends upon the depth of the stuffing box. (See tags attached to rings.)

1. The header ring must always enter stuffing box before first Sea Ring is installed, to prevent Sea Ring lip from buckling against bottom of stuffing box. Then follow with Sea Rings and finish with follower ring.

2. All Rings should be placed in stuffing box one at a time, each driven to proper place against preceding ring, and should be so placed that the joint of each ring will be on opposite sides of the rod or plunger from the joint of the preceding ring.

3. Insert Sea Rings with lip toward the pressure. In case of pumps that have to lift or engines running condensing, reverse last Sea Ring so that lip points toward gland or atmospheric pressure.

4. Sea Rings are intentionally made with inside diameter a little larger than the rod. Never cut off ends of rings to make them fit the rod tightly for this will make their outside diameter too small.

5. Never tighten gland more than enough to keep rings from moving in stuffing box. If packing leaks at first, let it alone for a while—don't tighten gland and distort the shape of the rings.

6. Sea Rings must fit into the stuffing box tightly or leakage will occur around *outside* of rings. In measuring for a set of Sea Rings, never take the outside diameter of the stuffing box *gland* for the inside diameter of the stuffing box, or outside of the rings will be too small.

Specifications

For those who desire to specify by description

Each set of packing shall have inside, outside and depth dimensions suitable for the rod and stuffing box for which it is intended, and is to consist of several packing rings and not less than one or more than two auxiliary rings or headers.

The packing rings of each set shall be constructed of a suitable fabric and friction or rubber cement for binding the piles of fabric together, and each ring shall have a "U" formed section having a thick peel on one side and a tapering flexible lip or tongue on the other side.

The thick heel shall be harder than the lip, which shall be flexible so as to conform to the surface of the rod or plunger which it packs.

The end of the heel shall be beveled or moulded so that it makes an angle of approximately 75 degrees with the axis of the rod or plunger packed.

The design and construction of the packing must be such that its action is positive—that is, the pressure of the packing on the rod or plunger must be dependent upon the pressure through the packing or stuffing-box and not dependent upon the pressure of the gland on the packing.

The auxiliary or header rings shall be of such construction and shape as to provide suitable seats for the first and last packing ring in the box to rest against.

The above described packing is not to be furnished where the space between the rod or plunger and the inside of the stuffing-box is less than 3/8 of an inch or where the diameter of rod or plunger is less than 3/4 of an inch.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 63 of 154
asbestosclaims.law/library/21286/63

A Few Prominent Users of Johns-Manville Sea Rings

Canadian

City of Lethbridge Power House, Lethbridge, Alta.
Canadian Carbonate Co., Montreal, Que.
Grodwards Co., Cobalt, Ont.
Polson Iron Works, Toronto, Ont.
Collingwood Shipbuilding Co., Collingwood, Ont.
Southern Ontario Gas Co., Hamilton, Ont.

New England States

Cheney Bros. (Inc.), So. Manchester, Conn.
United States Post Office, Boston, Mass.
National Shawmut Bank Building, Boston, Mass.
Worthington Pump & Machy. Corp., East Cambridge, Mass.
American Woolen Co., Lawrence, Mass.
United States Envelope Co., Springfield, Mass.
Graton & Knight Mfg. Co., Worcester, Mass.
American Optical Co., Southbridge, Mass.
Norton Company, Worcester, Mass.
Geo. W. Wheelwright Paper Co., Wheelwright, Mass.
Goodall Worsted Co., Sanford, Me.
St. Croix Paper Co., Woodland, Me.
S. D. Warren Co., Cumberland Mills, Me.
New Hampshire State Hospital, Concord, N. H.
Amoskeag Mfg. Co., Manchester, N. H.
J. & P. Coats (Inc.), Pawtucket, R. I.
Fales & Jenks Machine Co., Pawtucket, R. I.
B. B. & R. Knight, Providence, R. I.
Boutwell, Milne & Varnum Co., Montpelier, Vt.

Middle Atlantic States

Bethlehem Steel Co., Sparrow's Pt., Md.
Hotel Traymore, Atlantic City, N. J.
Penn. Shipbuilding Co., Gloucester, N. J.
St. George Hotel, Brooklyn, N. Y.
Garden City Co., Garden City, L. I.
B. Altman & Co., New York City, N. Y.
Dept. Water Supply, Gas & Elec., New York City, N. Y.
Standard Oil Co. of N. J., New York City, N. Y.
Southwark Foundry & Machine Co., Philadelphia, Pa.
American Engineering Co., Philadelphia, Pa.
Philadelphia Water Works, Philadelphia, Pa.
U. S. Steel Corp., Pittsburgh, Pa.
Denholm Packing Co., Pittsburgh, Pa.
Wilson-Snyder Pump Co., Pittsburgh, Pa.

Southern States

Cherry Cotton Mills, Florence, Ala.
Alabama Power Co., Birmingham, Ala.
Jacksonville Traction Co., Jacksonville, Fla.
Southern Utilities Co., Jacksonville, Fla.
Atlanta Gas & Lt. Co., Atlanta, Ga.
Atlantic Steel Co., Atlanta, Ga.
Anchor Duck Co., Atlanta, Ga.
Camperdown Mills, Greenville, S. C.
New River Collieries Co., Sun, West Va.

Central States

Libby, McNeill & Libby, Chicago, Ill.
Swift & Co., Chicago, Ill.
Otis Elevator Co., Chicago, Ill.
American Can Co., Chicago, Ill.
Armour & Co., Chicago, Ill.
Sinclair Refining Co., Chicago, Ill.
South East Coal Co., Seco, Ky.
Detroit United Rys. Co., Detroit, Mich.
Continental Motors Co., Detroit, Mich.
Cadillac Motor Co., Detroit, Mich.
American Steel & Wire Co., Cleveland, O.
Ohio Service Co., Coshocton, O.
Ohio Elec. Ry. Co., Springfield, O.
Brier Hill Steel Co., Youngstown, O.

Southwestern States

Swift & Co., Kansas City, Kan.
Prairie Pipe Line Co., Independence, Kan.
Swift & Co., St. Louis, Mo.
Tonopah Ext. Gold Mining Co., Tonopah, Nev.
Henderson Gasoline Co., Nowata, Okla.
Cosden & Co., Tulsa, Okla.
Armour & Co., Ft. Worth, Tex.
Producers Refining Co., Gainesville, Tex.
Gulf Pipe Line Co., Houston, Tex.

Pacific States

Union Oil Co., Los Angeles, Cal.
Hercules Power Co., San Diego, Cal.
Shell Oil Co., San Francisco, Cal.
Palace Hotel, San Francisco, Cal.
First Nat. Bank Bldg., San Francisco, Cal.
Mutual Bank Bldg., San Francisco, Cal.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 64 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/64

Johns-Manville Universal Rod and Plunger Packing



Coil Style 30



Spiral Style 31



Ring Style 32

FOR packing rods and outside packed plungers where space between rod and box is 3/8 of an inch or more—against steam, air, water and various fluids—specially adapted where a packing with a great amount of resiliency is required.

Universal Rod Packing is made of asbestos and cotton fabrics, which have been treated with rubber cements, built up together and wrapped around a rubber core or cushion.

The combination of asbestos and rubber produces a packing with great pliability and resiliency which is suitable for steam, air, hydraulic and various other conditions.

It is specially recommended for severe conditions such as high pressure hydraulic work, service where there is a great deal of vibration or where rods may be in poor condition or slightly out of alignment.

Furnished in Coil style 30, Spiral style 31, Ring style 32.

Universal Rod and Plunger Packing is packed as follows:

Ring—Unless otherwise specified, rings will be packed in boxes containing approximately the following weight.

Under 1″ rod	3 pounds	3″ to 4″ rod	15 pounds
1″ to 2″ rod	5 "	Over 4″ rod	20 "
2″ to 3″ rod	10 "		

Spiral—Furnished in boxes, each containing one length of packing approximately 12½ feet long.

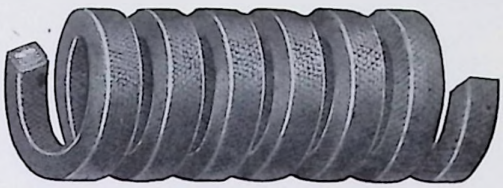
¼″	13 oz.	⅝″	4 lb.
5/16″	1 lb. 2 "	11/16″	4 " 8 oz.
⅜″	1 " 8 "	¾″	5 " 4 "
7/16″	2 "	⅞″	6 " 8 "
½″	2 " 8 "	1″	7 " 8 "
9/16″	3 " 4 "	Under ⅜″ rolled without rubber core.	

Coil—Furnished in coils approximately 12½ feet long, packed several coils to the box, depending upon the size of the packing and according to the following table:

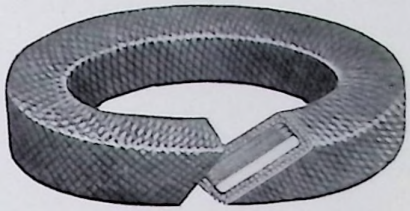
¼″ and 5/16″	6 coils	⅝″ and 11/16″	3 coils
⅜″ and 7/16″	5 coils	¾″ and 13/16″	2 coils
½″ and 9/16″	4 coils	⅞″ and over	1 coil

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 65 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/65

Johns-Manville Kearsarge Rod Packing



Spiral Style No. 166



Ring Style No. 150

For packing rods where space between rods and inside of stuffing-box is 3/8" or over, against steam or air at any pressure or temperature.

THE asbestos and other materials used and the construction of Kearsarge Rod Packing make it suitable for steam or air at any temperature and pressure, which eliminates the necessity of using several packings for various steam and air conditions. This means a minimum stock and the convenience of having one packing for many conditions.

Flexibility and resiliency are assured throughout the life of Kearsarge on account of its peculiar folded block or center construction, by the rubber expansion back or cushion which adds resiliency, and because rubber cement is entirely eliminated from the center block of the packing.

Kearsarge is constructed differently from other asbestos packings which may have the same exterior appearance. The block is formed by folding unrubbered asbestos cloth (same quality as used for the outside cover) back and forth, placing the rubber expansion back on top and covering the block thus formed with two wraps of asbestos cloth. There is no chance, even if cover wears away, for part of the packing to get loose and work away, for the center is folded from *one piece of fabric*—each layer a continuation of the adjacent one.

When cover wears away the first fold is presented to wear, and this is as strong and durable as the cover itself, for it is made of the same material.

There is no rubber cement in the block or body, which entirely eliminates the possibility of its becoming hard by vulcanizing. In assembling, the cover is so placed that it is impossible for it to be pulled or torn away from the body in service.

Furnished in Ring Style No. 150 and Spiral Style No. 166.

Kearsarge Rod Packing Is Packed as Follows:

Ring—Unless otherwise specified, rings will be packed in boxes containing approximately the following weight:

Under 1" rod	3 pounds	3" to 4" rod	15 pounds
1" to 2" rod	5 "	Over 4" rod	20 "
2" to 3" rod	10 "		

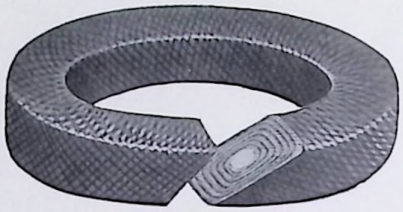
Spiral—Furnished in boxes, each containing one length of packing approximately 12½ feet long.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 66 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/66

Johns-Manville Duplex Rod and Plunger Packing



Coil Style No. 371



Ring Style No. 372

For packing rods and outside packed plungers where space between rod and inside of stuffing-box is 3/8" or over, against hot or cold water, all pressures and temperatures.

THE flax and rubber material used and the construction of Duplex Rod and Plunger Packing make it suitable for rod and outside packed plunger hydraulic service.

Johns-Manville Duplex Rod and Plunger Packing is extremely durable, because the cover or wearing surface is made of a fabric of tightly twisted, closely woven flax yarn, which wears better than the surface of a packing braided like ordinary flax.

The waterproof qualities of this packing are perfect because the layers of rubber cement between the several layers of flax fabric form waterproof walls that prevent leakage through the packing.

Flexibility and resiliency are assured on account of these same layers of non-vulcanizing rubber cement and because of the rubber core in the center of the packing.

Maximum durability and efficiency are obtained because of the woven wearing surface and because of the resiliency or life of the packing, which makes the stuffing-box tight with a minimum amount of gland pressure on the packing.

Furnished in Ring Style No. 372, Spiral Style No. 373 and Coil Style No. 371.

Duplex Rod and Plunger Packing Is Packed as Follows:

Ring — Unless otherwise specified, rings will be packed in boxes containing approximately the following weights:

Under 1" rod	3 pounds	3" to 4" rod	15 pounds
1" to 2" rod	5 "	Over 4" rod	20 "
2" to 3" rod	10 "	May be ordered in sets to exactly fit rod and stuffing-box.	

Spiral—Furnished in boxes, each containing one length of packing approximately 12½ feet long.

Coil—Furnished several coils to the box, the number depending upon the size of the packing.
Approximate weight per hundred feet of Duplex Packing treated with preserving liquid and graphite finish:

3/16"	12 pounds	3/4"	36 pounds
1/4"	22 "	7/8"	52 "
5/16"	28 "	1"	78 "

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 67 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/67

Johns-Manville Mogul Coil Packing



Twisted Style No. 193



Braided Style No. 222

For packing small rods, valve stems, etc., and where space between rod, stem or spindle and inside of stuffing-box is less than 3/8", or for packing conditions, such as for oils and chemicals, where no rubber is desired in the packing.

MADE of long fibre asbestos yarn, twisted or braided into coil form, lubricated and graphited. The asbestos yarn and lubricating compound used in the manufacture of both braided and twisted Mogul make it suitable for nearly any condition. It is a convenient all-around-the-plant packing, specially recommended for packing small rods and boxes, or for emergency use.

Furnished in Coil Styles only, on spools and reels—Twisted Style No. 193; Braided Style No. 222.

Mogul Packing Is Put Up as Follows:

Tin Spools ..... 1/4 pound each of 1/4" and smaller sizes
Fiber Spools ..... 1 pound each of 1/2" and smaller sizes
Wooden Spools ..... 5 pounds each for large sizes

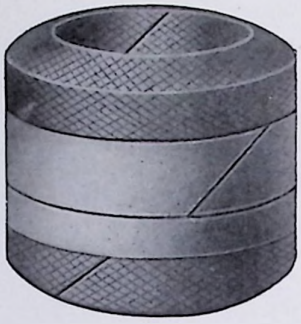
Special auto size packages on tin spools packed in individual paper boxes, sizes 1/8, 3/16 and 1/4 inch packing.

Approximate Weight of 100-foot Lengths

Size Inches	Weight, pounds per 100-foot length of Braided No. 222	Weight, pounds per 100-foot length of Twisted No. 193
1/8	1 1/4	1 1/4
1/4	3 1/2	3 1/4
3/8	7 3/4	7 1/4
1/2	11 1/4	12 1/2
5/8	20 1/2	24 1/2
3/4	30 1/4	28 1/4
7/8	42 1/2	40
1	50	57 1/2

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 68 of 154
asbestosclaims.law/library/21286/68

Johns-Manville Keystone Air Pump Packing



For packing the rods on the steam and air ends of Westinghouse and New York Air Pumps.

EACH individual set of Johns-Manville Combination Air Pump Packing consists of a pair of Vulcabeston concave and convex rings on each end of which is placed a No. 10 Jewett Ring, bevelled to fit the bottom of the stuffing box and the packing gland.

The Vulcabeston rings are made of asbestos and a suitable binding material which, when cured, vulcanized and pressed to shape and size in steel molds, make a hard and resilient ring with great density. They are built to resist high pressures and severe service.

The molded Jewett Rings on each end of the set are made of asbestos yarn thoroughly lubricated, braided to proper size and pressed into steel molds of exact shape and size.

These rings are of a softer nature than the Vulcabeston rings and not only conform readily to the shape of the stuffing box and packing gland but provide for proper lubrication.

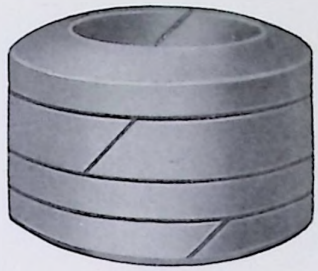
LIST OF SIZES

Style No. 300—For 6-inch Westinghouse Air Pump
Style No. 700—For 8-inch Westinghouse Air Pump
Style No. 500—For 8½-inch Westinghouse Air Pump
Style No. 600—For 9½-inch Westinghouse Air Pump
Style No. 800—For 11-inch Westinghouse Air Pump
Style No. 900—For Nos. 1 and 2 New York Air Pump
Style No. 1000—For No. 5 New York Air Pump
Style No. 1100—For No. 6 New York Air Pump

Prices on application

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 69 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/69

Vulcabeston Air Pump Packing



For packing the rods of air and steam ends of air pumps.

EACH individual set of Vulcabeston Air Pump Packing consists of several convex and concave rings, the two end rings being formed to fit the bottom of the stuffing box and the packing gland.

Vulcabeston rings are made of asbestos fibre and a suitable binder which is cured, vulcanized and molded to proper shape and size in steel molds. They are very dense and yet resilient and the manner of construction—i. e., convex and concave rings—insures a tight fit against both the pump rod and the inside of the stuffing box.

These rings are especially adapted to conditions where there is plenty of lubrication.

LIST OF SIZES

Style No. 404—For 6-inch Westinghouse Air Pump
Style No. 400—For 8-inch Westinghouse Air Pump
Style No. 440—For 8½-inch Westinghouse Air Pump
Style No. 544—For 9½-inch Westinghouse Air Pump
Style No. 1572—For 11-inch Westinghouse Air Pump
Style No. 168—For Nos. 1 and 2 New York Air Pumps
Style No. 268—For No. 5 New York Air Pump
Style No. 368—For No. 6 New York Air Pump
Style No. 4444—For 10½-inch Westinghouse Cross Compound Air Pump

Prices on application

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 70 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/70

Johns-Manville Kearsarge Air Pump Packing



Style No. 15

For packing rods on the air and steam ends of air pumps.

JOHNS-MANVILLE Kearsarge Air Pump Packing is constructed of asbestos fabric folded, cut and molded to the proper shape and size to fit air pump rods and stuffing box. It is similar in material and construction to Kearsarge Rod Packing described on page 63,—except that the rubber expansion back is eliminated.

This packing is thoroughly lubricated and is constructed with a minimum amount of rubber cement to minimize as much as possible the chance of its becoming hard in service due to high temperatures.

LIST PRICES

	Per Pound
Style No. 475—For 6-inch Westinghouse Air Pump	$2.50
Style No. 775—For 8-inch Westinghouse Air Pump	2.50
Style No. 575—For 8½-inch Westinghouse Air Pump	2.50
Style No. 675—For 9½-inch Westinghouse Air Pump	2.50
Style No. 875—For 11-inch Westinghouse Air Pump	2.50
Style No. 975—For Nos. 1 and 2 New York Air Pumps	2.50
Style No. 1075—For No. 5 New York Air Pump	2.50
Style No. 1175—For No. 6 New York Air Pump	2.50

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 71 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/71

Johns-Manville Special Combination Air Pump Packing



Air End
Style No. 55



Steam End
Style No. 15

For packing rods on the steam and air ends of air pumps.

JOHNS-MANVILLE Special Combination Air Pump Packing is designed to meet the most severe conditions encountered in this class of service.

The construction of each individual set that is intended for the air end is different from that intended for the steam end and the packings for the air ends and steam ends are packed respectively in separate cartons, each carton marked for the end of the pump for which it is intended.

The packing for the steam end is made of asbestos fabric thoroughly lubricated, formed, cut and pressed to proper size and is admirably adapted to steam end service.

The packing for the air end is a combination of asbestos yarn and copper wire formed into rings which are thoroughly lubricated, and which will withstand pressures and temperatures incident to this service without becoming hard and brittle.

List Prices

Style No. for Air End	Style No. for Steam End		Per Pound
1055	1015	For 6-inch Westinghouse Air Pump	$2.50
1155	1115	For 8-inch Westinghouse Air Pump	2.50
1255	1215	For 8½-inch Westinghouse Air Pump	2.50
1355	1315	For 9½-inch Westinghouse Air Pump	2.50
1455	1415	For 11-inch Westinghouse Air Pump	2.50
1555	1515	For Nos. 1 and 2 New York Air Pump	2.50
1655	1615	For No. 5 New York Air Pump	2.50
1755	1715	For No. 6 New York Air Pump	2.50

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 72 of 154
asbestosclaims.law/library/21286/72

Johns-Manville Kearsarge Throttle Packing



Style 15

For packing throttle rods of locomotives.

STYLE No. 15 is packing without rubber expansion back, otherwise the same as Standard Johns-Manville Kearsarge Rod Packing.

This packing is made of asbestos fabric formed, cut and molded to proper size. All rings are thoroughly lubricated.

Style No. 15 is especially adapted to high temperature conditions which would tend to vulcanize the rubber expansion back usually found in high-pressure packing and make it so hard that it would be of no value.

Put up in sets to exactly fill the stuffing-box.

When ordering, give exact outside diameter of rod, inside measurements of stuffing-box and depth.

Johns-Manville Locomotive Cab Cock Packing

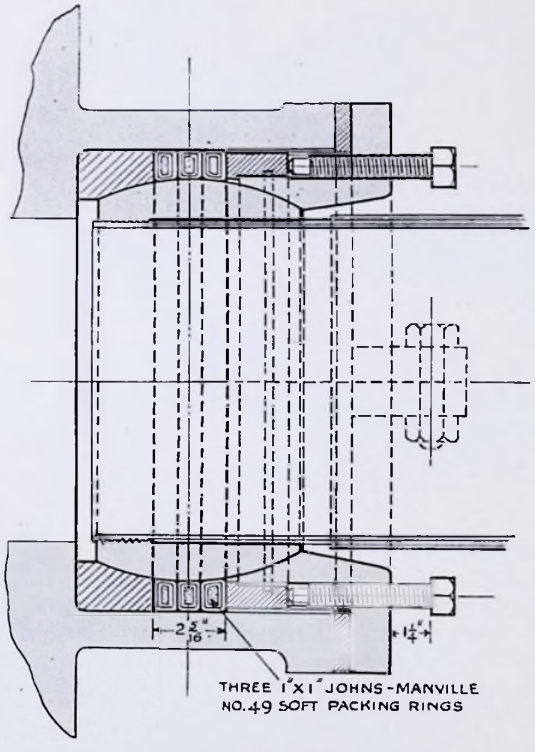
For packing valve stems of all cab fittings.

Style No. 210

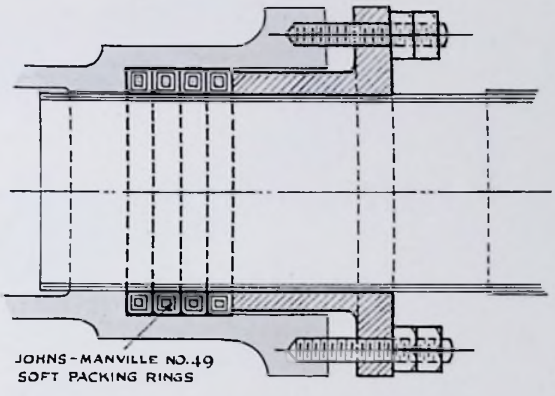
This packing is made of asbestos yarn lubricated and braided into coil form and is especially adapted to the severe conditions incident to this service.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 73 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/73

Johns-Manville Mallet Locomotive Receiver, Live Steam, Exhaust and Ball-Joint Packing



Ball Joint.



Expansion Joint.

Style No. 49

THIS is possibly the hardest service encountered in railroad work, and requires a special type of packing.

Johns-Manville Special Mallet Packing is furnished for both American and Baldwin types of locomotives using this compound system.

Prices and blue prints for applying will be sent on request.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 74 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/74

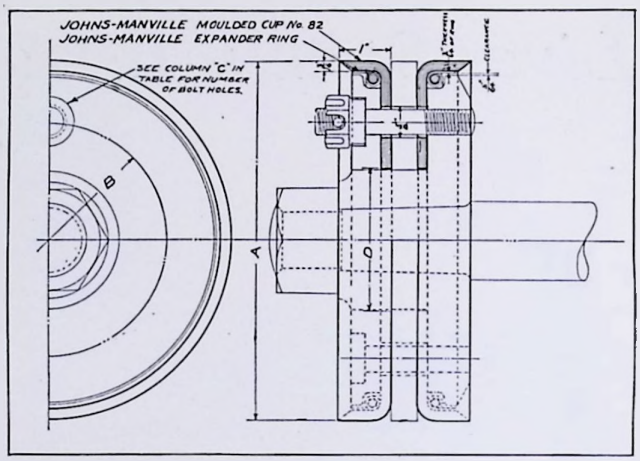
Johns-Manville Reverse Gear Piston Packing

THIS service requires a special type of packing, as it must hold air as well as steam under severe conditions.

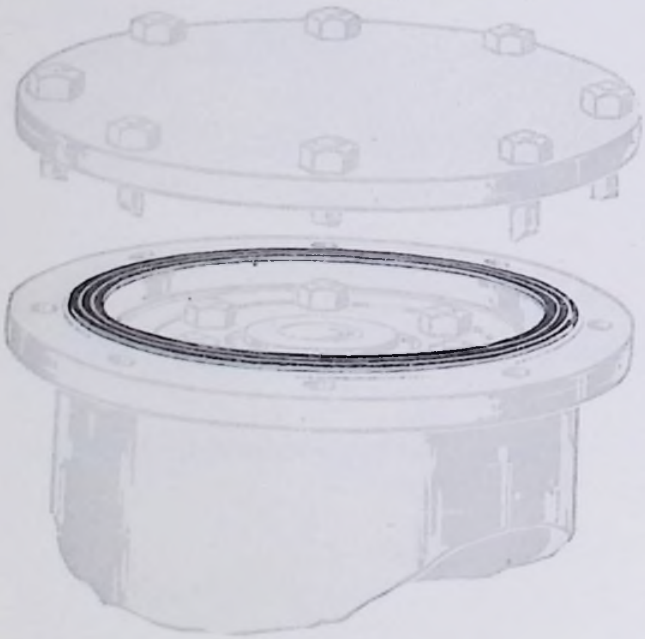
Johns-Manville manufacture packings for Ragonnet, Mellin, Alco, Lewis, Casey-Cavin or other types of reverse gears and we will welcome the opportunity to offer our engineering service on request.

The piston rod may be packed with standard air-pump packing.

D	C	B	A	Line No.	Type of Gear
2¾"	4	4½"	7"	1	Ragonnet
2¾"	4	6"	9"	2	"
2¾"	4	7"	10"	3	"
6"	6	7⅝"	10"	4	Ragonnet & Mellin
2¾"	4	4⅝"	7"	5	Mellin



Johns-Manville Molded Asbestos Brake Cylinder Gaskets



Furnished for all size brake cylinders

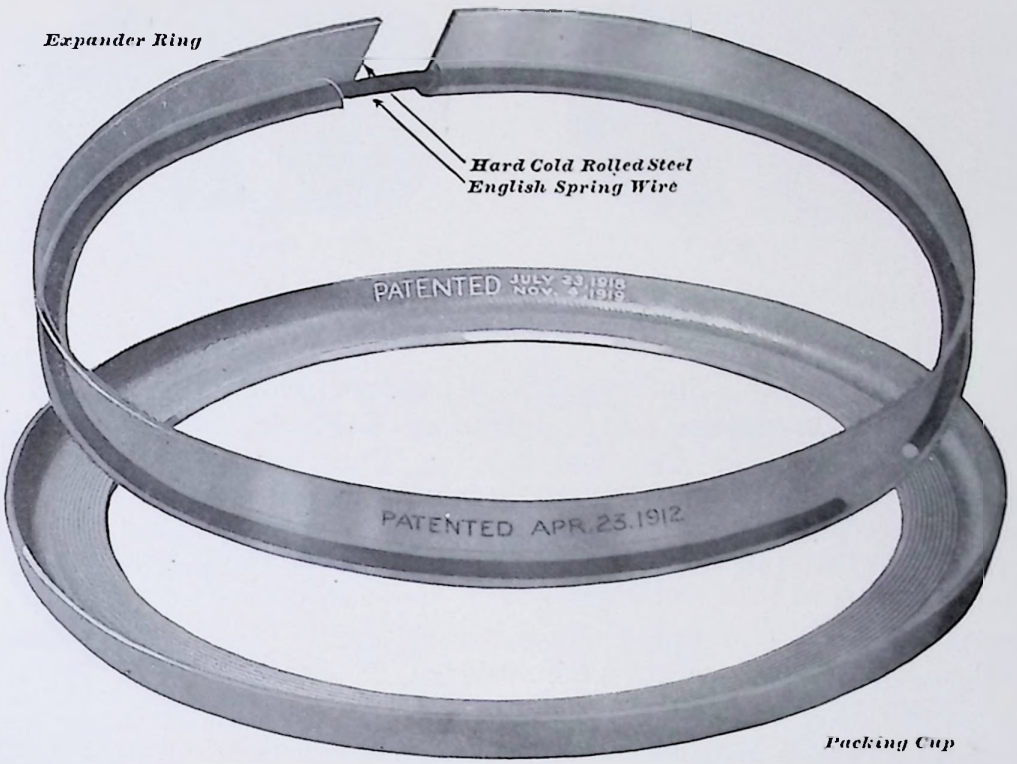
In conducting tests of the Brake Cylinder Packing Set, at times there were inexplicable leaks occurring which were not leaking past the cup and expander ring. In running these down with the aid of a torch and soapsuds, it was found that the leakage was through the gasket on the brake cylinder head.

The explanation of this is manifestly simple. The rubber gasket, such as is ordinarily used and furnished as part of the brake cylinder equipment, dries out quickly and causes leakage on the pressure end of the brake cylinder. Moreover, it is usually stuck fast by means of varnish, shellac, or some other method, and with the oil conditions found on locomotives, it is not very long before the gasket is eaten or blown out by the pressure.

The Asbestos Brake Cylinder Gasket, as shown in the illustration, is of an indestructible nature; the asbestos making them impervious to the wear and deteriorating conditions that destroy ordinary rubber gaskets. On a recent test, one was removed and reapplied sixty times, and on its last application was still absolutely air tight.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 75 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/75

Johns-Manville Air-Brake Cylinder Packing Set



For packing against air-pressures met in railroad practice

THE set is formed of the non-porous Johns-Manville Packing Cup, held air-tight against the cylinder walls by the Johns-Manville Expander Ring.

The Johns-Manville Packing Cup is made of plies of asbestos fabric, impregnated and formed under enormous pressure. It is non-porous—air-tight, made to withstand wear, heat, pressure, friction, oil and condensate. Furthermore it fits—snugly, and never becomes porous in service.

The Johns-Manville Expander Ring is of the best cold-rolled and spring steel. Instead of a mere loop of wire, with the pressure on the cylinder wall exerted on a line tangential to the round section of the wire, and usually with less than an eighth of an inch bearing surface, its band of spring steel holds the packing cup tightly and evenly over a half-inch of bearing surface all around the cylinder.

The Johns-Manville Packing Set—one of the greatest of modern brake improvements—practically eliminates air-leakage in brake cylinders. Made to fit all standard sizes of brake cylinders, it can be applied without change of any of the parts of the equipment, and has proven, in actual service tests, to reduce maintenance costs, with increased braking efficiency.

Johns-Manville Packing Cup Price List

6 inch	$1.20	12 inch	$2.00
7 inch	1.20	13 inch	2.40
8 inch	1.20	14 inch	2.40
9 inch	1.60	16 inch	2.80
10 inch	1.80	18 inch	3.20

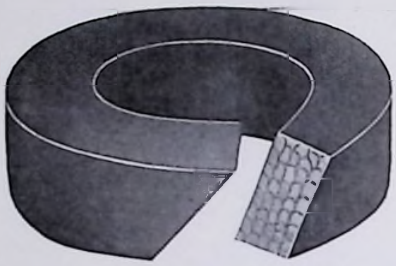
Johns-Manville Slip Type Expander Ring Price List

6 inch	$ .80	12 inch	$1.10
7 inch	.80	13 inch	1.20
8 inch	.80	14 inch	1.20
9 inch	.95	16 inch	1.35
10 inch	.95	18 inch	1.40

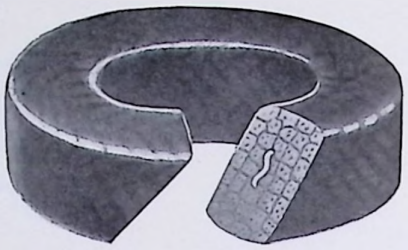
Discounts on Application

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 76 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/76

Johns-Manville Jewett Ring Packing



Jewett Ring, Style No. 20



Jewett Ring, Style No. 10

Small Packing Rings

For packing small rods and spaces where rings of exact dimensions are required or desired.

MADE of asbestos, cotton or flax yarn (according to style and service), Jewett Rings are intended for packing small spaces, i. e., where the space between rod, spindle or shaft and the stuffing-box is less than $\frac{3}{8}$" and where it is impossible to make other styles of packing in such small sizes.

All Jewett Rings are molded to exact shape and size in steel dies, so that they exactly fit rod and stuffing-box for which they are intended. They are made in several styles for different conditions as follows:

JOHNS-MANVILLE JEWETT RINGS, STYLE No. 10: For any condition where a ring of small cross section is required or where a packing with no rubber in its composition is preferable; i. e., for some chemical solutions, etc. This style is made of wire-inserted asbestos yarn, braided into jackets one over another around a thin lead ribbon; lubricated, graphited and molded into ring form.

JOHNS-MANVILLE JEWETT RINGS, STYLE No. 310: This packing is made of exactly the same material, and of the same form of construction as Johns-Manville Jewett Rings, Style No. 10, but is furnished in coil form.

JOHNS-MANVILLE JEWETT RINGS, STYLE No. 20: Only for conditions that require a ring with a small but rectangular cross section, i. e., a very narrow flange or width and a depth or thickness several times greater, for example: $\frac{1}{2}$" I. D. x $\frac{3}{4}$" O. D. x $\frac{3}{8}$" deep. Made of Asbesto-Metallic Cloth, folded into tape, cut to proper length and molded into rings.

JOHNS-MANVILLE JEWETT RINGS, STYLE No. 40: Especially adapted for hot water, light oils and gasoline service. Constructed similar to No. 10 except that flax yarn, without wire, is used instead of wire-inserted asbestos yarn.

JOHNS-MANVILLE JEWETT RINGS, STYLE No. 3: For hot and cold water service. Especially designed for packing faucets, fuller cocks and plumbing products. This packing is lubricated with mica instead of oil, so that it will not affect the process of nickel-plating. Made with jute center with a braided cotton jacket or cover molded to exact size. Furnished in white finish.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 77 of 154
asbestosclaims.law/library/21286/77

Johns-Manville Universal Piston Packing



Cross Section of Style No. 33, end opened to show construction



Piston Packing, Style No. 34

For packing the pistons of inside packed pumps against water, brine, air, oils and some chemicals.

A COMBINATION of asbestos and cotton fabrics folded and molded together so as to present a wearing surface of rounded shoulders of most durable material. The back and forth folded construction of Universal Piston Packing makes it superior to the laminated type of hydraulic packing for the following reasons:

As the packing is made of continuous fabric folded back and forth, there are no separate laminations to work loose from one another by the side-swiping action against the pump cylinder walls. This accounts for the life of the packing being longer than that of any other hydraulic piston packing.

The folded construction gives Universal greater flexibility, resiliency and expansion in the direction desired, which also means longer service and less leakage or slippage past the packing when the pump is in service.

The rubber cement that holds the folds of Universal together is strong and tough. This packing is vulcanized in steel molds, so that the sizes are more accurate than laminated hydraulic packing, which is cut in strips from slab stock. Due to the methods and materials used in constructing Universal, it is very durable and more economical than other packings sold at a much lower per-pound price.

Coil Style No. 33; Spiral Style No. 34; Ring Styles No. 70, Solid; No. 35, Split.

Johns-Manville Universal Packing for Oil

Universal Packing is made for oil service same as above, except that special binding compounds suitable for oil service are used.

Ring Style No. 38 Spiral Style No. 37 Coil Style No. 36

Johns-Manville Universal Piston Packing Is Packed as Follows:

Ring—Unless otherwise specified, rings will be packed in boxes containing approximately the following weights:

Under 1″ rod	3 pounds	3″ to 4″ rod	15 pounds
1″ to 2″ rod	5 "	Over 4″ rod	20 "
2″ to 3″ rod	10 "	May be ordered in sets to exactly fit piston.	

Spiral—Furnished in boxes, each containing one length of packing approximately 12 feet long.

Coil—Furnished in coils approximately 12 feet long, packed several coils to the box, depending upon the size of the packing and according to the following table:

3/8″	5 coils per box	9/16″	3 coils per box	3/4″	2 coils per box
7/16″	4 " " "	5/8″	3 " " "	7/8″	1 coil " "
1/2″	4 " " "	11″/16	2 " " "	1″	1 " " "

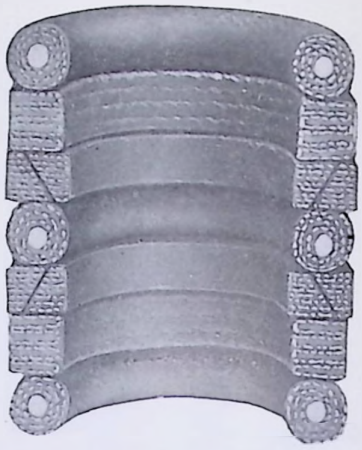
Approximate weights of 100-foot Lengths of Universal Piston Packing:

3/8″	11 1/2 pounds	3/4″	33 1/2 pounds
1/2″	18 "	7/8″	45 1/4 "
5/8″	25 1/2 "	1″	62 "

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 78 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/78

Johns-Manville Universal Steam Hammer Combination Packing

Johns-Manville Steam Hammer Packing is well adapted to railroad shop service. The style of packing recommended depends upon whether the rod is round or has one or more flat sides and upon other conditions which vary considerably in different shops.



Ring Combination, Style No. 28 and 29

A combination of asbestos, cotton and rubber

STEAM hammer service is exceptionally severe on account of the unusual vibration, accumulation of dirt and grit on rods, and intermittent service. The form of rings used in Universal—round, square, and diagonal cut—provides for vibration.

The wearing surface resists the wear caused by dirt and grit, because the square rings have a wearing surface of rounded shoulders instead of laminated edges, and all the rings are made of a combination of cotton and asbestos fabrics which makes them most durable. The arrangement of the variously formed rings makes the set particularly flexible and resilient, and contraction and expansion caused by intermittent service are taken care of by this method of arrangement.

Furnished in Standard Ring Style No. 29 only.

Special sets for rods with flat sides on application.

Johns-Manville Universal Ammonia Combination Packing

For packing rods of ammonia compressors

A combination of asbestos, cotton and rubber. Universal Rings No. 28 have exceptional resiliency and expansional qualities that make them pack tightly at all temperatures. The construction of the square rings, which present rounded shoulders instead of edges to rod wear, makes them especially durable.

The combination of asbestos fabric with cotton fabric and the arrangement of several styles of rings enables the packing to better withstand the variety of temperatures it may be subjected to.

On account of the desirable expansional qualities of Universal No. 28, this packing should always be allowed to expand to its maximum when installed and the machine first started. It is often necessary to take out one or more rings when the packing expands. These may be used when the packing wears down, but by always allowing the packing to expand to its maximum, exceptional service will be obtained.

Furnished in Combination Ring Style No. 28 only.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 79 of 154
asbestosclaims.law/library/21286/79

Johns-Manville Asbestos Wick and Rope Packing

Johns-Manville Asbestos Wick Packing is made in four styles:

Johns-Manville Wick, Style No. 4195, a plain one-strand wick for ordinary service.

Johns-Manville Canadax Wick, Style No. 195, a plain asbestos wick made of several strands twisted together.

Johns-Manville "XX" Wick, Style No. 199, made of absolutely pure asbestos, for wire wiping, valve stem packing against acids and special conditions.

Johns-Manville Standard Wick, Style No. 202, similar to "XX" Style but twisted harder and tighter.

Furnished in ½ and 1 lb. balls.

Johns-Manville Asbestos Twisted Rope Packing

Made from asbestos yarns, twisted around an asbestos core. In three styles:

Johns-Manville Canadax, Style No. 196, Commercially Pure.

Johns-Manville "XX", Style No. 200, Absolutely Pure.

Johns-Manville Standard, hard and tightly twisted, Style No. 203, Absolutely Pure.

Furnished on 10, 25 and 50 lb. reels.

Johns-Manville Asbestos Braided Rope Packing

Johns-Manville Canadax Braided Rope Packing, Round Style No. 566 and Square Style No. 787 (Commercially Pure)—Made of twisted rope covered with braided asbestos jacket. ⅛" to and including ¾" has one, larger sizes two braided jackets.

Johns-Manville Solid Braided Rope Packing, Round Style No. 702 and Square Style No. 733 (Commercially Pure)—Made of jackets braided one over another, in sizes ⅛" and larger.

Johns-Manville "XX" Braided Rope Packing, Round Style No. 812 and Square Style No. 834 (Absolutely Pure)—Made of twisted rope covered with braided asbestos jacket. ⅛" to and including ¾" size has one, larger sizes two braided jackets.

Johns-Manville Standard Solid Braided Rope Packing, Round Style No. 788 and Square Style No. 873 (Absolutely Pure)—Made of jackets braided one over another, in sizes ⅛" and larger.

Furnished on 10, 25 and 50 lb. reels.

Johns-Manville Asbestos Cord

A fire and acid-proof Asbestos cord, with strong, hard-twisted strands. Especially valuable in glass and chemical works, and for suspending metals, retorts and crucibles in contact with fire or heat; also used as a string packing on small valves.

Sizes: 1/16" to ⅜" in diameter.

Weights: ½ and 1 lb. balls, 5 and 10 lb. spools, 25 and 50 lb. reels.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 80 of 154
asbestosclaims.law/library/21286/80

Other Johns-Manville Packings

THE rod, plunger and piston packings described on the preceding pages are those that we recommend for greatest service and economy. They are our standard proprietary packings, built with the intent to serve better, longer and more economically than any other packing, rather than to be similar in appearance and equal in quality to something else.

We continue to manufacture some flax, rubber and duck, and hydraulic packings for those who desire them, and while we advise the use of more modern types of packing whenever possible, we exercise as much care as ever in the selection of materials and in the manufacture of these packings.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 81 of 154
asbestosclaims.law/library/21286/81

A Few Prominent Users of Johns-Manville Standard Packings

Canadian

Robert McNair Shingle Co., Port Moody, B. C.
Pacific Mills, Ltd., Ocean Falls, B. C.
B. C. Sulphide Co., Vancouver, B. C.

New England States

American Woolen Co., Boston, Mass.
General Electric Co., West Lynn, Mass.
S. D. Warren Co., Cumberland Mills, Me.
Sullivan Machinery Co., Claremont, N. H.
Pacific Mills, Lawrence, Mass.
Rutland R. R. Company, Rutland, Vt.
New England Westinghouse Co., Springfield, Mass.
J. B. Williams Co., East Glastonbury, Conn.
General Fire Extinguisher Co., Providence, R. I.
Atlantic Mills, Providence, R. I.
Warren Cotton Mills, Warren, Mass.
Boston Consolidated Gas Co., Boston, Mass.

Middle Atlantic States

Baltimore & Ohio R. R. Co., Baltimore, Md.
Remington Typewriter Co., Ilion, N. Y.
B. Altman & Co., New York City, N. Y.
Dept. Public Charities, New York City, N. Y.
Belnord Realty Co., New York City, N. Y.
Hotel St. George, Brooklyn, N. Y.
Empire State Dairy, Brooklyn, N. Y.
Garden City Co., Garden City, L. I.
White Springs Paper Co., West Nutley, N. J.
John Wanamaker, Philadelphia, Pa.
Worth Brothers, Coatesville, Pa.
Harnot Hospital, Erie, Pa.
Boll Engine Co., Erie, Pa.
U. S. Horse Shoe Co., Erie, Pa.

Southern States

Tenn. Coal, Iron & R. R. Co., Birmingham, Ala.
Southern Utilities Co., Jacksonville, Fla.
Anchor Duck Co., Rome, Ga.
Atlantic Steel Co., Atlanta, Ga.
Atlanta Gas Lt. Co., Atlanta, Ga.
Toxaway Tanning Co., Rosman, N. C.
Rocky Mount Public Works, Rocky Mount, N. C.
Virginia Woolen Co., Winchester, Va.

Central States

Crane Co., Chicago, Ill.
Int. Harvester Co., Chicago, Ill.
American Can Co., Chicago, Ill.
Peoples Gas Lt. & Coke Co., Chicago, Ill.
Illinois Steel Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
Northern Ind. Gas & Elec. Co., Chicago, Ill.
United States Fuel Co., Chicago, Ill.
Wilson & Co., Chicago, Ill.
Cudahy Packing Co., Chicago, Ill.
Libby, McNeill & Libby, Chicago, Ill.
Swift & Co., Chicago, Ill.
Merchants Ht. & Lt. Co., Indianapolis, Ind.
Citizens' Gas Co., Indianapolis, Ind.
National Glue Co., Indianapolis, Ind.
Kingan & Co., Indianapolis, Ind.
Detroit United Rys. Co., Detroit, Mich.
Stearns Salt & Lumber Co., Ludington, Mich.
Dow Chemical Co., Midland, Mich.
American Steel & Wire Co., Cleveland, O.
Browning Co., Cleveland, O.
Ohio Electric Ry. Co., Springfield, O.
Republic Iron & Steel Co., Youngstown, O.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis.
National Brake & Electric Co., Milwaukee, Wis.
Worthington Pump Co., Milwaukee, Wis.
Bucyrus Co., Milwaukee, Wis.

Northwestern States

Blackwell Lumber Co., Coeur d'Alene, Idaho.
United Light & Railways Co., Davenport, Ia.
Fort Dodge Gas & Elec. Co., Fort Dodge, Ia.
Mason City Brick & Tile Co., Mason City, Ia.
North Iowa Brick & Tile Co., Mason City, Ia.
Ottumwa Light & Ry. Co., Ottumwa, Ia.
Anchor Coal Co., Ottumwa, Ia.
Emerson-Brantingham Co., Minneapolis, Minn.
Kinnard Haines Co., Minneapolis, Minn.
Booth Cold Storage Co., Minneapolis, Minn.
Northern States Power Co., St. Paul, Minn.
American Smelting Co., Omaha, Neb.
Otis Elevator Co., Omaha, Neb.
Standard Oil Co., Omaha, Neb.
Swift & Co., S. Omaha, Neb.
Cudahy Packing Co., S. Omaha, Neb.

Pacific States

White Pass & Yukon Railroad Co., Dawson, Alaska.
Benson Hotel, Portland, Oregon.
Northwest Steel Works, Portland, Ore.
Willamette Steel & Iron Wks., Portland, Ore.
Puget Sound Traction, Lt. & Power Co., Bellingham, Wash.
National Lumber & Mfg. Co., Hoquiam, Wash.
Skinner & Eddy Co., Seattle, Wash.
Puget Sound Traction, Lt. & Power Co., Seattle, Wash.
Sperry Flour Co., Tacoma, Wash.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 82 of 154
asbestosclaims.law/library/21286/82

Johns-Manville Sheet Packings, Gaskets, Pump Valves and Power Plant Supplies

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 83 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/83

Johns-Manville Service Sheet Packing

Style No. 60



For packing parallel surfaces of flanges against steam (superheated or saturated), air, water, ammonia, oil and various acidulated and alkaline or other chemical solutions

JOHNS-MANVILLE Service No. 60 is a sheet designed to give satisfactory service under practically any conditions that a sheet would be used for. *It has given and will give* satisfactory service where other sheet packings have failed.

The proper combination of Asbestos and bonding materials thoroughly mixed and felted together under enormous pressure has produced a sheet that is pliable, resilient, adaptable to all general work, and one which does not deteriorate with age.

This eliminates the necessity of stocking several sheets for different conditions, which not only reduces waste and loss due to deterioration but also eliminates the use of a wrong sheet for a certain service.

It is so dense and yet so resilient that it may be used in thicknesses one-half as great as with sheets of rubber or other materials.

Service Sheet Packing weighs approximately:

	1/16" thick	1/32" thick	1/64" thick
Per square yard	5.4 lbs.	2.7 lbs.	1.4 lbs.
Per square foot	.6 lbs.	.3 lbs.	.15 lbs.
Per square inch	.0041 lbs.	.002 lbs.	.001 lbs.

Taking into consideration the density, resiliency and light weight of Service Sheet, it is more economical to use than rubber and many other types of sheet packings sold at lower per-pound prices.

Furnished in standard sheets 54″ x 63″ and 54″ x 126″ and in thicknesses of 1/64″, 1/32″ and 1/16″; also made 1/8″ and 3/32″ thick.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 84 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/84

A Few Prominent Users of Johns-Manville Service Sheet Packing

Canadian

Canadian Pacific Railway Co., Montreal, Que.
Canadian Vickers, Montreal, Que.
Dominion Iron & Steel Co., Sydney, N. S.

Foreign

Honolulu Iron Works, Honolulu, T. H.

New England States

The New London Ship & Engine Co., Groton, Conn.
Boston Consolidated Gas Co., Boston, Mass.
American Sugar Refining Co., Boston, Mass.
General Electric Company, Lynn, Mass.
Harvard University, Cambridge, Mass.
Holyoke Valve & Hydrant Co., Holyoke, Mass.
United States Envelope Co., Worcester, Mass.
American Woolen Company, Lawrence, Mass.
Boston Elevated Railway Co., Boston, Mass.
Boston & Albany Railroad, Boston, Mass.
N. Y., N. H. & H. R. R., New Haven, Conn.
Bethlehem Shipbuilding Corporation, Ltd., Quincy, Mass.
American Steel & Wire Co., Worcester, Mass.
Warren Steam Pump Company, Warren, Mass.
International Paper Co., Bellows Falls, Vt.
General Fire Extinguisher Co., Providence, R. I.
Washburn Wire Company, Phillipsdale, R. I.
W. H. McElwain Co., Manchester, N. H.
Brown Company, Berlin, N. H.
Pepperell Manufacturing Co., Biddeford, Me.
Great Northern Paper Co., Madison, Me.

Middle Atlantic States

B. F. Shaw Co., Wilmington, Del.
E. I. Du Pont de Nemours Powder Co., Wilmington, Del.
Hercules Powder Co., Wilmington, Del.
William Underwood Co., Jonesport, Me.
Great Northern Paper Co., Millinocket, Me.
Goodall Worsted Co., Sanford, Me.
Sullivan Machinery Co., Claremont, N. H.
W. H. McElwain Co., Manchester, N. H.
Merck & Co., New York City
British American Chemical Co., New York City
Standard Oil Co. of New York, New York City
Standard Oil Co. of New Jersey, New York City
New York & Pennsylvania Co., New York City
American Cigar Company, Philadelphia, Pa.
York Manufacturing Co., York, Pa.
Harwood Electric Co., Philadelphia, Pa.
Philadelphia Electric Co., Philadelphia, Pa.
Gulf Refining Co., Philadelphia, Pa.
U. S. Steel Corporation, Pittsburgh, Pa.
American Zinc & Chemical Co., Langeloth, Pa.
Vulcan Oil Refining Co., Pittsburgh, Pa.
Erie Malleable Iron Co., Erie, Pa.
Mesta Machine Co., Homestead, Pa.

Southern States

Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Southern Utilities Co. Jacksonville, Fla.
Champion Fibre Co., Canton, N. C.
Virginia Alberne Corporation, Alberne, Va.

Central States

La Belle Iron Works, Steubenville, O.
Tennessee Copper Co., Copperhill, Tenn.
Allis-Chalmers Manufacturing Co., Milwaukee, Wis.
Evinrude Motor Co., Milwaukee, Wis.
Milwaukee Coke & Gas Co., Milwaukee, Wis.
Republic Iron & Steel Co., Youngstown, Ohio.
The United Fuel & Gas Co., Charlestown, West Va.
The Willys-Overland Co., Toledo, Ohio.
The Champion Ignition Co., Flint, Mich.
American Steel & Wire Co., Cleveland, Ohio
Brier Hill Steel Co., Cleveland, Ohio
Pensylvania Salt Mfg. Co., Detroit, Mich.
The Youngstown Iron & Steel Co., Youngstown, O.
Illinois Steel Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
Cudahy Packing Co., Chicago, Ill.
American Can Co., Chicago, Ill.
Armour & Company, Chicago, Ill.
Sinclair Refining Co., Chicago, Ill.
Merchants Heat & Light Co., Indianapolis, Ind.
Citizens Gas Co., Indianapolis, Ind.
Kingan & Co., Indianapolis, Ind.

Northwestern States

Emerson-Brentingham Co., Minneapolis, Minn.
Kinnard Haines Co., Minneapolis, Minn.
Booth Cold Storage Co., Minneapolis, Minn.
American Smelting & Refining Co., Omaha, Nebr.
Swift & Co., South Omaha, Nebr.
Standard Oil Co., Omaha, Nebr.
Northern States Power Co., St. Paul, Minn.
Iowa Railway & Light Co., Cedar Rapids, Iowa
William Galloway Co., Waterloo, Iowa

Pacific States

Pacific Gas & Electric Co., San Francisco, Cal.
Skandia Pacific Oil Eng. Co., Oakland, Cal.
Union Gas Engine Co., Oakland, Cal.
Kimball-Upson Co., Sacramento, Cal.
Union Oil Co., Los Angeles, Cal.
Hercules Powder Co., San Diego, Cal.
Union Lumber Co., Fort Bragg, Cal.
North Star Mines Co., Grass Valley, Cal.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 85 of 154
asbestosclaims.law/library/21286/85

Johns-Manville Seigelite Sheet Packing

Style No. 711



For packing flanges or joints against gasoline, benzine, oil, greases, hot or cold water and air.

A FIBROUS material that resists the action of any of the above fluids, because it contains no rubber or rubber substitutes that are soluble in oil or gasoline. It has an extremely high tensile strength and when immersed in water or other fluids becomes tough, resembling rawhide.

It is more desirable than rubber or rubber cloth insertion sheets for hydraulic service, on account of its strength.

It is sold by the square yard, is comparatively low in price and can be used with greater economy and efficiency than "black oil proof" rubber sheet; "red rubber sheet"; and C. I. (cloth insertion) sheets.

In general, Johns-Manville Seigelite is recommended for making joints between surfaces such as pipe flanges, cylinder heads, manifolds and plumbing specialties, by power plants, mills and factories, auto repair shops, automobile manufacturers, gas-engine manufacturers, motor-boat trade, steam-fitters and plumbers, etc.

Sizes, Weights and Prices

Thickness Inches	Width	Length	Approximate Weight per Sq. Yd.	List Prices
.01″	46″ to 48″	25 or 50 yd. rolls	.5 lbs.	$ .85 per sq. yd.
1/64″	"	"	.81 "	1.05 " " "
.02″	"	"	1. "	1.35 " " "
1/32″	"	"	1.7 "	1.90 " " "
1/16″	Sheets only 46″ to 48″ x 36″		3.5 "	4.50 " " "

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 86 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/86



Johns-Manville Kearsarge Asbesto-Metallic Sheet Packing

Style No. 100

Generally used where surfaces are somewhat rough or uneven and where a sheet of a soft nature is therefore required.

THIS packing is constructed of tightly twisted asbestos yarn, spun with brass wire to give additional strength, woven into Asbesto-Metallic Cloth and impregnated with Johns-Manville Heat-Resisting Compound.

Furnished in rolls 40″ wide, about 250 lbs. each, in 1/32″, 1/16″ and 1/8″ thickness. Can be furnished graphited on one or both sides, if desired.

Johns-Manville Mobilene Sheet Packing

Style No. 101

For packing gas and gasoline engine parts



While Johns-Manville Service Sheet Packing is our recommendation for gas engines and garage service, Mobilene, a pioneer gas engine packing, is still frequently demanded for packing cylinder-head joints and various parts of gas and gasoline engines. This packing is made of asbestos fabric of great strength, with fine brass wire interwoven, and impregnated with a special compound to withstand the high temperatures incident to this service. It has red compound on one side, so the packing will stick to the flange when joint is broken, and graphite on the other to allow joint to be easily taken apart.

Furnished in rolls 40″ wide, 250 lbs. each; 1/32″ and 1/16″ thick.

Johns-Manville Liberty Red Rubber Sheet Packing

Style No. 107

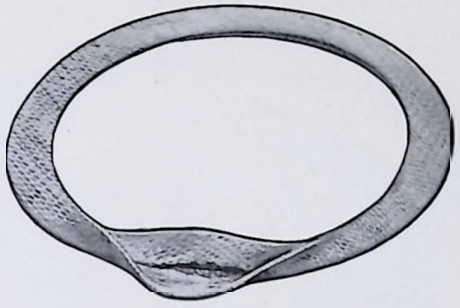
For medium or low pressure steam and hydraulic service.

This packing is manufactured from a special heat-resisting rubber compound of the highest quality, is comparatively light in weight, and will not deteriorate rapidly.

Furnished plain or with wire insertion, in rolls 36″ wide and weighing 250 lbs. each; 1/32″, 1/16″ and 1/8″ thick.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 87 of 154
asbestosclaims.law/library/21286/87

Johns-Manville Kearsarge Standard Asbesto-Metallic Boiler Manhole, Handhole and Tube Plate Gaskets



For packing manhole and handhole plates of boilers.

MADE of Asbesto-Metallic fabric treated with a heat-resisting compound, and folded into several plies or thicknesses to proper size and shape. Furnished in oval form to fit plate for which they are intended. The gaskets are made so that an unbroken rounded shoulder comes on the outside of the gasket which is presented to the pressure. The edges of the folds are on the inside of the gasket.

Kearsarge Gaskets may be used over again if properly applied. On this account and because of their light weight, they are most economical gaskets to use.

Furnished in Style No. 116 for manholes, No. 117 for handholes, and No. 119 for tube plates.

Johns-Manville Kearsarge Jointless Tube Plate Gaskets

Style No. 118

For B. & W. and Heine tube plates.

Made of Asbesto-Metallic fabric treated with high-heat resisting compound and folded into several plies or thicknesses to proper size and shape.

Furnished in Style No. 118 for packing boiler tube plates.

JOHNS-MANVILLE KEARSARGE JOINTLESS TUBE PLATE GASKETS, STYLE No. 118, are made seamless, without a joint, as they are made from Asbesto-Metallic yarn, woven into hose or tubular form and properly folded.

The advantage in using jointless gaskets for tube plate work is that there is no tape joint to interfere with perfect seating, so necessary when gaskets with a very narrow flange are used.

These gaskets are light in weight, very strong and treated with the same high-heat resisting compound used in the manufacture of Johns-Manville Kearsarge Standard Gaskets.

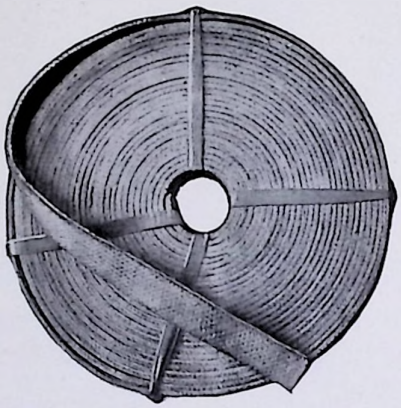
Directions for Proper Application of Johns-Manville Kearsarge Manhole and Handhole Gaskets

Best results are obtained by placing a gasket on the Manhole or Handhole plate, then rubbing as much dry flaked graphite as possible on the exposed surface. The plate is then put into place. Before removing, the plate and boiler shell should be marked so that it can be replaced in exactly the same position. If this method is followed, the gasket always seats in the same place and the graphite prevents the gasket from sticking to the boiler shell, while the ungraphited side next to the Manhole or Handhole plate makes the gasket adhere to the plate when it is withdrawn.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 88 of 154
asbestosclaims.law/library/21286/88

Johns-Manville Kearsarge Asbesto-Metallic Gasketing Tape

Style No. 120



For making odd or irregular shaped gaskets to pack joints against steam, air, water, ammonia, and various acidulated, alkaline, and other chemical solutions.

MADE of Asbesto-Metallic Yarn, woven into fabric and treated with a high-heat resisting resilient cement.

This material is generally used when a softer gasketing than Johns-Manville Service Sheet Packing is required, on account of rough surfaces to be packed.

Furnished in widths ½" and greater, and in thickness ⅛", 3/16" and ¼". Put up in 5 and 10 lb. rolls. Cannot be made in widths less than ½".

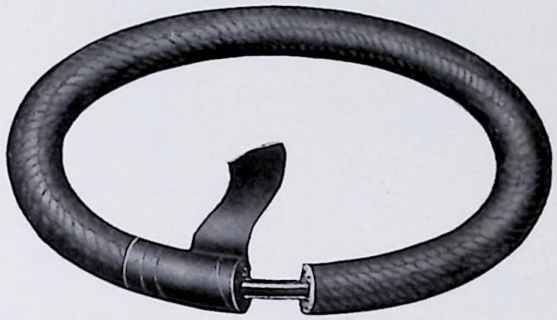
Approximate Weights per 25 feet of Kearsarge Tape, Style No. 120

Width	⅛" Thick	3/16" Thick	¼" Thick
½ Inches	1¼ Pounds	2 Pounds	2½ Pounds
¾ "	1⅝ "	3 "	3¾ "
1 "	2⅛ "	3¾ "	5 "
1¼ "	2¾ "	5 "	6½ "
1½ "	3¼ "	5⅝ "	7 "
1¾ "	3⅞ "	7⅛ "	8⅝ "
2 "	4¼ "	7 13/16 "	10 "

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 89 of 154
asbestosclaims.law/library/21286/89

Johns-Manville Kearsarge Asbesto-Metallic Tubular Gasketing

Style No. 124



To make manhole and handhole gaskets for boilers in cases of emergency, or wherever a gasket with a round cross-section is required, as in the case of grooved flanges.

Made by rolling the same Asbesto-Metallic fabric used in the manufacture of Kearsarge Standard Gaskets into coils of round section with a hollow center. This gasketing is primarily an emergency packing, but is used quite extensively for making odd or irregular-shaped gaskets, or for packing joints where grooves are provided for the packing to rest in, as in the case of the doors of sterilizers, etc.

Kearsarge Asbesto-Metallic Tubular Gasketing is packed in boxes weighing approximately 5 lbs. or boxes weighing approximately 10 lbs., the number of 12½-foot lengths per box depending upon the size of gasketing.

Tape and lead are furnished with gasketing.

Approximate Weights of 12½-foot Lengths

Size of Gasketing.	Ap. Wt. of 12½′ Lengths.
⅜ Inch	1 Pounds
½ "	1⅜ "
⅝ "	2½ "
¾ "	3¾ "

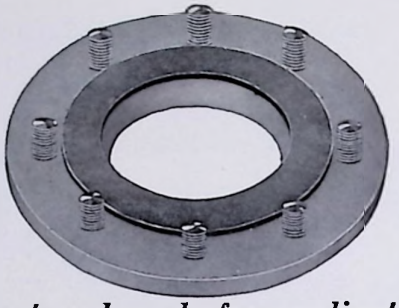
Vulcabeston Union Washers

For packing "Standard" and "Crane" unions.

These washers are molded from Vulcabeston Compound which is composed of pure long asbestos fibre and vulcanizable gums, and are especially adapted for service in steam, hot water, ammonia and gas pipes. Made in all sizes for regular unions.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 90 of 154
asbestosclaims.law/library/21286/90

Johns-Manville Service and Seigelite Flange Joint Gaskets



Where gaskets cut and ready for application are desired, we shall be pleased to quote on application, and to sizes or sketches submitted.

WE are prepared to cut and furnish gaskets from any of our sheet packings. Inquiries should be accompanied with complete dimensions or sketches. Service and Seigelite are adapted to practically any service and we advise using gaskets cut from either of these materials whenever possible.

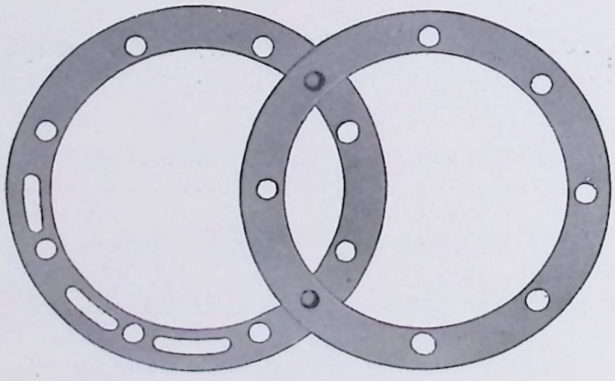
Service—Style No. 61

Johns-Manville Service Gaskets No. 61 are cut from Johns-Manville Service Sheet, described on page 81, and may be used for any variety of conditions. Standard in thicknesses of 1/64", 1/32" and 1/16".

Seigelite—Style No. 712

Seigelite Gaskets No. 712 are cut from Seigelite Sheet No. 711, described on page 83. Furnished in thicknesses of .01", 1/64", .02", 1/32", 1/16".

Johns-Manville Top Head and Bottom Head Gaskets for Air Pumps



JOHNS-MANVILLE Top Head and Bottom Head Gaskets are cut or molded from materials suitable for this class of service.

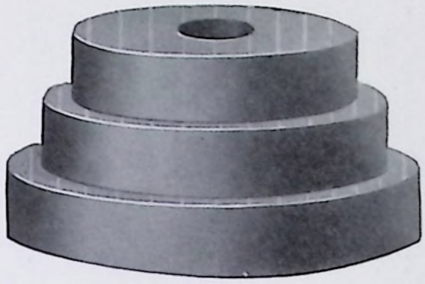
Prices depend upon the size of apparatus for which the gaskets are intended to be used and upon the material from which they are made.

Prices quoted upon application.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 91 of 154
asbestosclaims.law/library/21286/91

Vulcabeston Pump Valves

Style No. 206

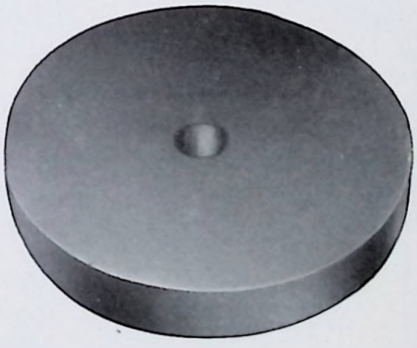


MOLDED from a specially prepared grade of Asbestos Vulcabeston stock under an enormous pressure and at a high temperature.

Vulcabeston Pump Valves will satisfactorily meet almost any condition encountered in pump work. Therefore, their use eliminates the necessity of using many valves of various densities for different conditions. Will not deteriorate when kept in stock.

The asbestos fibre and binding ingredients used in the construction of these valves make them so tough that they are practically unbreakable, and they will not crack or chip off. Exceptional economy is afforded by the use of Vulcabeston Valves on account of their life as compared with rubber and other valves. Although hard and dense, they possess the desirable quality of resiliency which makes them suitable for low-pressure, as well as high-pressure conditions. Table of sizes on page 90.

Johns-Manville Rubber Pump Valves



Johns-Manville Cold Water Pump Valves, Style No. 416—A medium hard valve for cold water, fresh, salt or alkaline.

Johns-Manville Condenser Valves, Style No. 420—A soft red condenser valve for lake, marine, and other severe condenser conditions.

Johns-Manville Hot Water Pump Valves, Style No. 424—A hard valve for hot water, oily and alkaline solutions, that will stand temperatures up to 250° F.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 92 of 154
asbestosclaims.law/library/21286/92

Vulcabeston Pump Valves No. 206

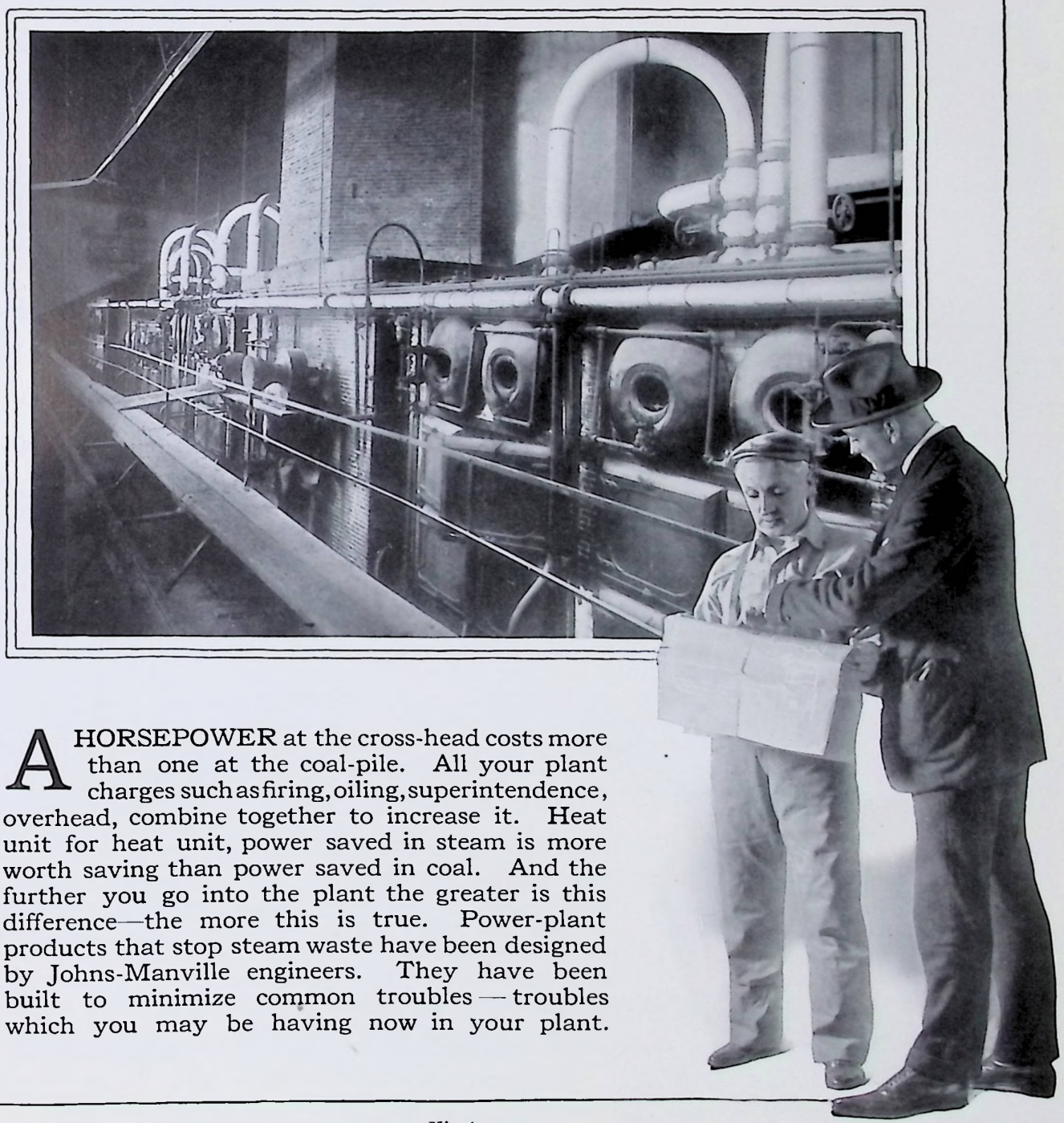
Mold Sizes and Numbers

Outside Diam. Inches	Thickness Inches	Size Hole Inches	Mold Number	Prices on Application
1¾	¾	½	2596	"
2	½	⅝	2774	"
2	7/16	7/16	2774¼	"
2	½	⅞	2632	"
2¼	7/16	½	3692	"
2¼	½	9/16	230½	"
2 5/16	½	½	4328	"
2 7/16	⅜	½	1886	"
2 7/16	⅝	Solid	2796	"
2½	½	½	73¼	"
2½	⅝	⅝	5248	"
2⅝	½	½	682	"
2⅝	5/16	1	4623	"
2¾	⅝	Solid	1149	"
2¾	⅜	⅝	3883A	"
2¾	⅝	⅝	3883	"
2¾	½	⅜	4527A	"
2¾	½	1	4527	"
3	⅜	½	46¾	"
3	½	½	1849¼	"
3	⅝	½	4777	"
3	½	9/16	1849	"
3	½	⅝	4896	"
3	⅝	⅝	2695	"
3	¾	¾	5247	"
3⅛	½	⅝	5941	"
3 5/32	3/16	½	5310	"
3¼	½	½	2636	"
3¼	⅝	⅝	4325	"
3¼	⅝	11/16	3587	"
3¼	¼	¾	172	"
3¼	¾	½	2769	"
3⅜	½	1⅛	1854	"
3⅜	⅜	19/32	39	"
3⅜	⅝	⅝	1854¼	"
3 7/16	½	⅝	683	"
3½	⅝	⅜	104½	"
3½	½	½	414	"
3½	9/16	½	3551	"
3½	⅝	9/16	957	"
3½	½	⅝	104	"
3½	⅝	⅝	1865¼	"
3½	⅞	⅝	1865	"
3½	¼	1 3/16	3709	"
3⅝	½	½	1174	"
3⅝	¾	¾	4897	"
3⅝	⅝	⅝	1174¼	"
3¾	⅝	9/16	905	"
3¾	11/16	⅝	4783	"
3¾	⅝	11/16	905¼	"
3¾	½	¾	2739	"
3¾	½	1½	4526	"
3¾	¾	9/16	4783¼	"
3¾	⅜	1⅝	4622	"
3⅞	½	19/32	1984	"
3⅞	¾	⅝	3994	"
4	11/16	9/16	3549	"
4	⅝	½	4547	"
4	⅝	⅝	1658½	"
4	⅝	21/32	1658	"
4	¾	¾	4460	"
4	¾	Solid	48½	"
4⅛	½	¾	2595	"
4⅛	¾	¾	2784	"
4¼	⅝	⅝	6490	"
4¼	⅝	¾	82½	"
4¼	¾	9/16	82¼	"
4¼	¾	¾	82	"
4¼	⅝	13/16	4838	"
4⅜	⅝	1⅛	4247	"
4 7/16	¾	1⅛	4327	"
4½	½	½	256	"
4½	¾	½	256A	"
4½	⅝	⅝	256¾	"
4½	¾	13/16	2813	"
4½	⅝	⅞	256¼	"
4½	⅞	⅞	4620	"
4½	⅜	15/16	5386	"
4 9/16	½	11/16	3588	"
4⅝	⅝	11/16	2603	"
4⅝	⅝	⅝	4551	"
4⅝	¾	¾	4898	"
4 11/16	⅝	⅝	1864	"
4¾	⅝	11/16	5976¼	"
4¾	⅝	13/16	5976	"
4¾	¾	¾	4491	"
4¾	⅞	1	3986	"
4¾	⅝	1 1/16	1940	"
4¾	½	2	4525	"
4 27/32	½	11/16	012½	"
5	½	½	415	"
5	¾	25/32	1846	"
5	¾	⅝	4539	"
5	⅝	Solid	2741¼	"
5	⅝	¾	2741	"
5	⅞	⅞	4071	"
5¼	⅝	⅝	4408	"
5¼	9/16	¾	2662A	"
5¼	¾	¾	2662	"
5⅜	¾	11/16	5416	"
5⅜	11/16	¾	1939	"
5⅜	½	13/16	2605	"
5⅜	⅞	⅞	3723	"
5½	⅝	⅝	2740	"
5½	¾	⅝	4755	"
5½	¾	25/32	3848	"
5½	¾	⅞	2710	"
5¾	¾	¾	6779	"
5¾	⅞	⅞	6782	"
5⅞	½	1 1/16	4802	"
5 15/16	½	1	636	"
6	1	11/16	4722	"
6	1	15/16	6676	"
6	¾	⅝	652¼	"
6	¾	1	652	"
6	⅝	1 5/16	654	"
6	⅜	2½	1782	"
6⅜	¾	1¼	5969	"
6½	⅝	1	4786	"
6½	¾	1	5792	"
6⅞	⅜	1	651	"
7	⅝	13/16	4627A	"
7	¾	13/16	4627	"
7	1 1/16	1	3550	"
7½*	¾	¾ & 1⅛	5016	"
7½	⅞	1	1875	"
7½*	1	13/16 & 1 1/16	2969	"
7½	1	Solid	2969¼	"
7½	⅝	1	5282	"
7 15/16	⅜	Solid	4220	"
8	⅜	Solid	376	"
8	¾	1¼	4070¼	"
8	1	1	4070	"
8	5/16	2¾	694	"
8¼	⅜	Solid	1228	"
8¾	⅝	Solid	1645	"
8¾	1	¾	6426	"

*Holes in these valves have counter bore half way through, of larger size given.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 93 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/93

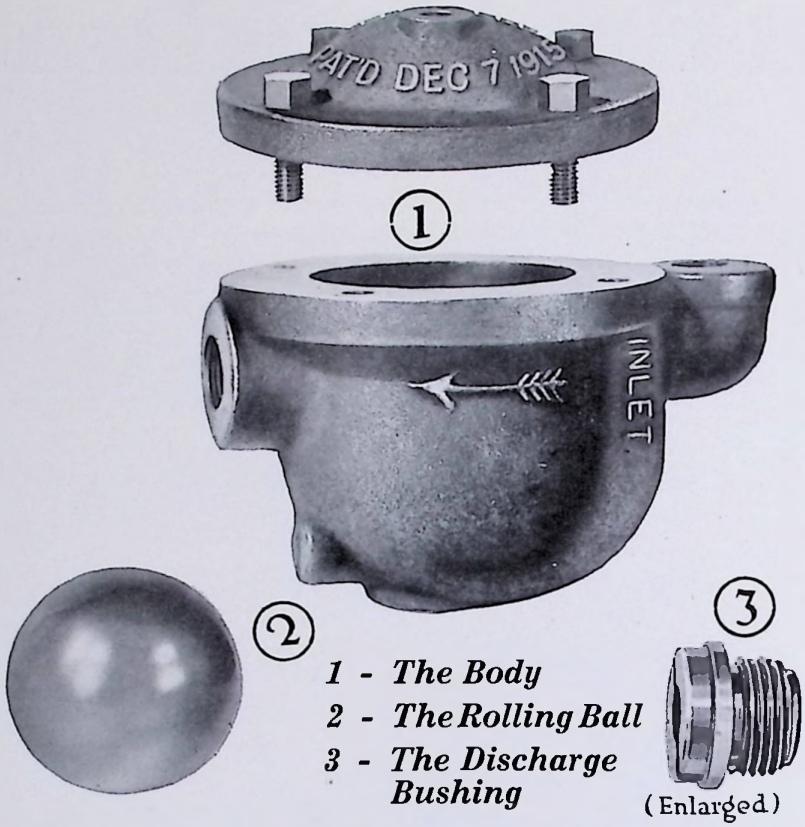
Power Plant Products That Pay Dividends



A HORSEPOWER at the cross-head costs more than one at the coal-pile. All your plant charges such as firing, oiling, superintendence, overhead, combine together to increase it. Heat unit for heat unit, power saved in steam is more worth saving than power saved in coal. And the further you go into the plant the greater is this difference—the more this is true. Power-plant products that stop steam waste have been designed by Johns-Manville engineers. They have been built to minimize common troubles — troubles which you may be having now in your plant.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 94 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/94

The Johns-Manville Steam Trap



OWNERS, superintendents and engineers give the purchase of large units for their power or heating plants the most careful consideration; but the importance of the smaller and less expensive power-plant unit is often overlooked.

For example: The economical operation of a plant is largely dependent upon the efficiency of the *steam trap* used, and the little device that guards the outlet of the coil or radiator, that should prevent any steam from getting away before it has given up its heat and yet allows ALL water and air to get away and make room for more steam, is an important factor of the heating system.

See table showing loss due to steam leakage, page 137 Appendix.

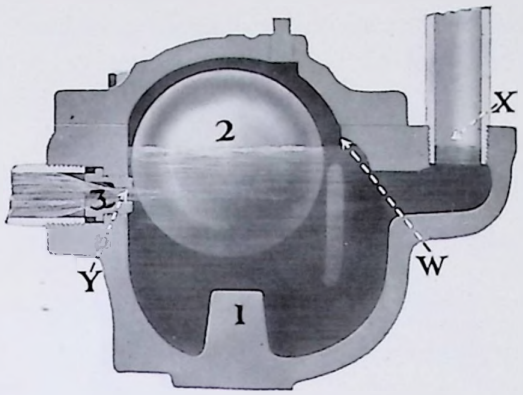
Permanent Perfect Operation

of a trap necessarily depends upon the design of the trap and the arrangement of its parts. The Johns-Manville Trap has only three parts—the body, the discharge bushing, which screws into the outlet of the body, and the hollow, seamless copper ball, which is free to float and move in the body.

Wear and Maintenance Cost

naturally depend upon the number of trap parts—especially those that move or those that are subject to corrosion.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 95 of 154
asbestosclaims.law/library/21286/95



Action of the Johns-Manville Trap

When water first flows into the trap at X and begins flowing out of the discharge orifice Y, the ball (2) floats to and is held against the discharge bushing (3) by an unbalanced steam pressure.

The discharge orifice is completely sealed until the water level (W) in the trap begins to rise, then the buoyant force of the water rolls the ball upwards on the face of the discharge bushing (3), exposing either part or the entire area of the discharge orifice (Y)—depending upon the quantity of water entering the trap at X.

When the quantity of water entering the trap at X decreases, the level of the water drops to the point where the ball again partially or completely covers the discharge orifice Y, being held tightly against the face of the bushing (3) by the unbalanced steam pressure. In this way a water seal is provided between the steam in the top of the trap and the discharge orifice Y, eliminating all possibility of steam leakage.

The one moving part of the Johns-Manville Trap, the BALL—replaces the valve, valve stem, levers, cotter pins, springs, thermostatic parts, buckets and all other variety of parts used in the construction of other types of steam traps.

Air Binding

in a trap prevents its operation, and if the trap will not discharge air or gas as well as water, the air will accumulate in the trap and system unless vented by some supplementary means.

The inability of other types of steam traps to discharge air *with the water* and WITHOUT LOSS OF STEAM is because their construction and principle of operation require a thick water seal over the outlet of the trap to prevent the loss of steam, and such a water seal effectually prevents the discharge of air.

The Johns-Manville Trap will not air bind because air (heavier than steam but lighter than water,) accumulates on the surface of the water, which is a very short distance above the trap outlet and is discharged with the water through small vortices that form between the surface of the water and the outlet.

We put a pet cock on the cover of our trap, not as an air relief, but because it is useful to show that the trap is operating properly.

Steam Leakage

is impossible with the Johns-Manville Trap because there is always a thin water seal between the outlet and the steam. If the water-level drops too near the outlet the ball also floats lower, closes the outlet and effectively stops discharge of water or steam.

Operation

of the Johns-Manville Trap is positive and simple. It depends entirely upon the amount of water flowing to the trap.

The ball is held against the flat surface of the discharge bushing by the pressure in the system.

Water flowing into the trap acts as a force which raises or rolls the ball upward on the face of the discharge bushing and thus exposes part or all of the outlet orifice. The ball rises and falls, according to the quantity of condensation coming to the trap, and the flow from the trap is regulated accordingly.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 96 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/96

The Johns-Manville Steam Trap

on account of its simplicity of construction and operation, requires practically no attention.

There are no adjustments to make—no valves to stick. Replacements or repairs seldom have to be made. In fact, there are only two parts,—the ball and discharge bushing,—that could wear.

Operation is positive and continuous, hence any machine or system to which these traps are attached is always free of air and water.

A "by-pass" is unnecessary with the Johns-Manville Trap, for if the ball or bushing has to be removed the trap itself will act as a by-pass.

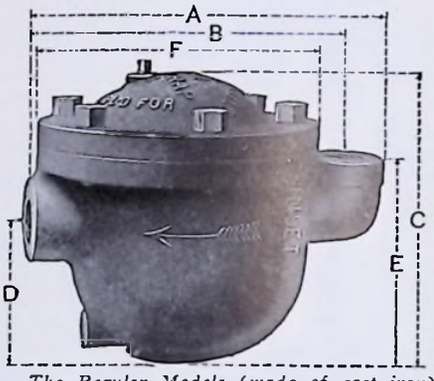
Capacity and Dimensions

IMPORTANT—Before placing an order please read page 95.

The capacities given are average; not the maximum for pipe sizes shown as are frequently given in other capacity tables. Peak or emergency conditions frequently require a trap to handle more water than when operating under normal conditions so a factor of safety should be allowed. The Johns-Manville Trap will take care of more water than any other trap of the same size.

Cast Iron Models for Any Pressure

Trap No.	Pipe Size Ins.	CAPACITY: Lbs. of Water per Hour	CAPACITY: Square Feet Radiation Surface	CAPACITY: Linear Feet 1-inch Pipe	DIMENSION IN INCHES. (See View.) A Ins.	B Ins.	C Ins.	D Ins.	E Ins.	F Ins.	Weight Lbs.	List Prices Each
2	¾	700	2000	6000	7¾	6¾	5¾	3¼	4½	5¾	14	$27.00
3	1	1000	3000	9000	9¾	8¾	7¾	4	5½	7¼	28	35.00
4	1¼	1700	5000	15000	12	10½	9¼	4¾	6½	9	44	40.00
5	1½	3500	10000	30000	12½	Inlet Horizontal	12	5¾	7¼ To Center	12	90	70.00
6	2	6000	18000	54000	13¾	Inlet Horizontal	13½	6¼	7¾ To Center	13¾	130	95.00



The Regular Models (made of cast iron) are suitable for all pressures. The Junior Models are not made for pressures over one hundred lbs. per square inch.

Bronze Junior Models for Pressures Up to 100 Pounds

For Dimensions and Weights, see page 96.

Trap	Pipe Size Inches	Pressure Range	Lbs. of Water per Hour	Sq. Ft. Radiation Surface	Linear Feet 1-In. Pipe	List Price Each
Equipped with bushings for LOW MEDIUM HIGH pressures.	½	1-10 lbs. 10-30 lbs. 30-100 lbs.	250	750	2200	$10.00

Bronze Radiator Trap Models

For Dimensions and Weights, see page 97.

For Pressures Up to 10 Pounds—Either Gravity or Vacuum Systems

Furnished in Bronze or Bronze with Plain Nickel Finish

Trap	Pipe Size Inches	Pressure Range	Lbs. of Water Per Hour	Square Feet Radiation Surface	Linear Feet 1-Inch Pipe	List Price Each
Standard Angle Type.....	½" and ¾"	0 to 10 pounds	80	250 or less	750	½" bronze.....$7.00 ½" nickel finish.... 7.50 ¾" bronze..... 8.00 ¾" nickel finish.... 8.50
Straightway Type.....	½" and ¾"	0 to 10 pounds	80	250 or less	750	½" bronze..... 8.00 ½" nickel finish.... 8.50 ¾" bronze..... 9.00 ¾" nickel finish.... 9.50
Corner Type..... (Right and left)	½" only	0 to 10 pounds	80	250 or less	750	½" bronze..... 8.00 ½" nickle finish.... 8.50

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 97 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/97

When ordering always give us sufficient information to fill in this blank or send your request for blanks to nearest Johns-Manville Branch

Customer's Name .....

Customer's Address .....

H. W. Johns-Manville Co. .....Branch

JOHNS-MANVILLE STEAM TRAP SHEET

1. Service on which trap will be used .....

State whether it is to be connected to a steam main drip; steam separator; hot-water heater; feed-water heater; blower or blast coil sections; direct heating coils or radiators; or to some machine or manufacturing apparatus—like drying-cylinders of paper machines or cloth finishing machines; steam-heated steam jackets of cooking utensils, glue-pots, plate-warmers, ovens, kilns, submerged boiling-coils, etc. If possible give size of apparatus trap is to be connected to and whether it will be connected to one or more units.

2. Approximate quantity of water trap is to handle..... Give in gallons or pounds per hour. If at intervals the trap has to take care of a specially large volume of water, state so. If not possible to get amount of water trap must handle, give full description of apparatus it is to drain with number of square feet of heating or radiating surface. Compare quantity of water given here to capacity table.

3. Size of pipe that connects to trap inlet .....

4 Trap No. .....

5. Steam pressure at the trap.....Lbs. This does not mean boiler pressure but actual pressure at the trap.

6. Will trap have to discharge against back pressure.....Often discharge lines carry back pressure; if so, state back pressure in pounds.

7. Is water to be lifted when discharged.....If so, give number of feet water is to be lifted.

8. Will trap have to discharge into vacuum return.....This is most important as special discharge orifice is required for vacuum.

9. If trap replaces another, give name and size of old trap.....

Remarks.....

Salesman.....Date ..... 19.....

Customer's Signature.....

Note—It pays to install traps amply large, and it is always better to put one trap on each coil, heater or machine, rather than group machines and drain into one trap.

How to Order a Johns-Manville Steam Trap

Two points must be determined before we ship a Johns-Manville Steam Trap:
First—Its size.
Second—Size of hole in discharge bushing.

THE trap size depends upon the quantity of water to be handled, just as the size of a pump or engine depends upon the quantity of water to be pumped or power to be developed. The size of hole in discharge bushing depends upon the net or effective pressure at the trap—that is, the pressure that holds the ball against the discharge orifice.

By answering the questions asked on the data sheet reproduced above, you enable us to determine rather than guess how to fill your order.

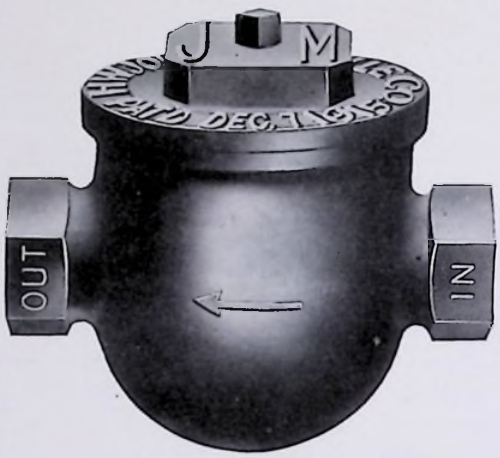
A *large* trap will handle a small amount of water, and a trap equipped with a small discharge orifice for high pressures will discharge *some* water at lower pressures, but it is not consistent with Johns-Manville Power Plant Service to recommend a larger trap than necessary or to guess at the size of hole in discharge bushing.

It is because *exorbitant* factors of safety *are costly to the purchaser,* although they protect the manufacturer, that Johns-Manville Service contemplates not only furnishing a device or material that will do that for which it is intended, but a device or material that will do that work most efficiently and economically.

We want you to know why we take the trouble to ask you for information that may appear unnecessary, or information for which other manufacturers may not trouble you.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 98 of 154
asbestosclaims.law/library/21286/98

The Johns-Manville Junior Trap



4 Inches Long 3½ Inches High Weight 2 Pounds
½ Inch Pipe Connections

A PERFECT little trap for all service. Ideal for small steam line drips, coils, indirect stacks, radiators, cooking-utensils, coffee-urns, plate-warmers, steam-tables, sterilizers, ovens, kettles, glue-pots, steam-plates, laundry machines, dryers, dressers, calenders, etc., or wherever condensation does not exceed 250 pounds per hour.

The Johns-Manville Junior not only has all the advantages of the larger Johns-Manville Trap, but is built to act as a check valve as well as a trap. If steam pressure in the discharge line exceeds that in the inlet line, the ball rolls back, closes the inlet and acts as a check valve.

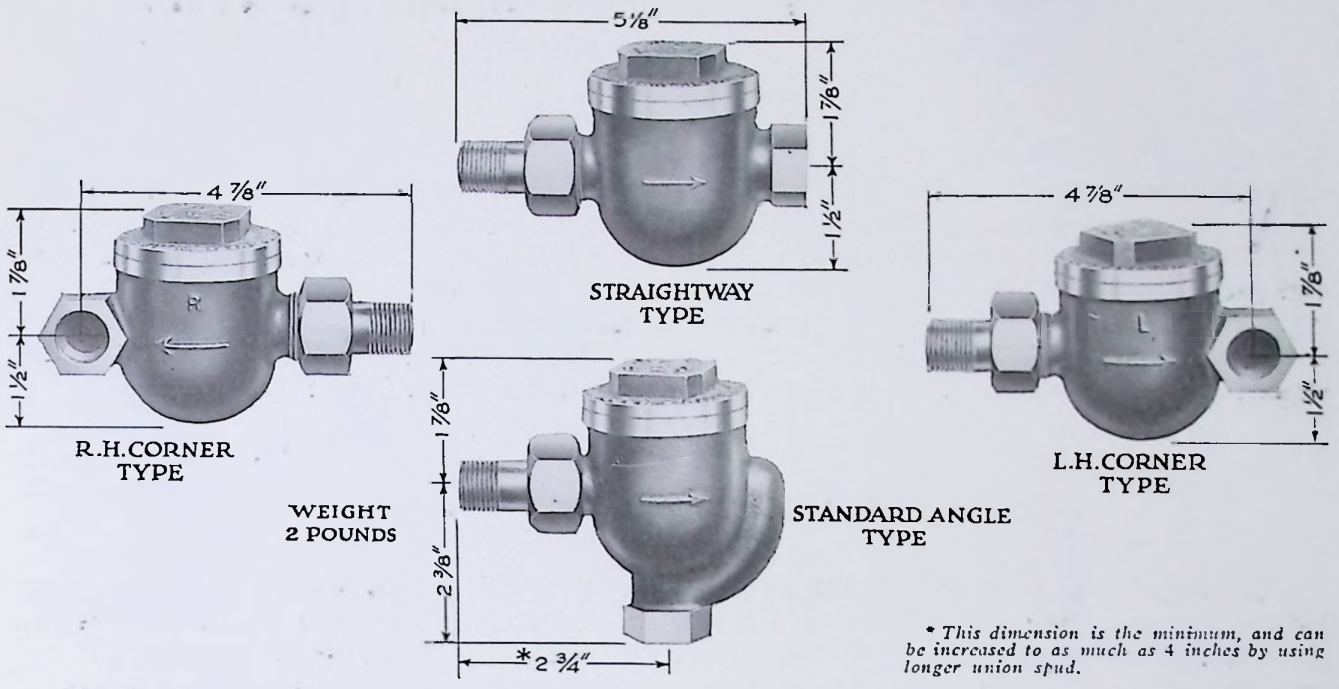
The Junior, too, consists of only a body, rolling ball and discharge bushing. Discharges continuously; will not leak steam; has no complicated part and CAN NOT AIR-BIND.

Johns-Manville Junior Steam Traps are equipped with bushings for low, medium and high pressures. Neatly finished, made of highest grade steam metal.

Pressure ranges are 1-10 lbs.; 10-30 lbs.; 30-100 lbs., see page 94 for list prices.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 99 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/99

The Johns-Manville Radiator Trap



* This dimension is the minimum, and can be increased to as much as 4 inches by using longer union spud.

THE Johns-Manville Radiator Trap operates on exactly the same principle as the Johns-Manville Steam Trap. The only part that moves is the ball—it discharges air, gas and water continuously as they come to it and without loss of steam. *The action of the Johns-Manville Radiator Trap is positive*—that is, it is operated *directly* by the water of condensation which must be discharged from the radiator, and not indirectly by the temperature of the water to be discharged. Those qualities which make it superior, and so desirable to use with heating systems are:

Simplicity—Nothing to get out of order.

Durability—Nothing to wear—repairs and replacements minimum.

Non-Adjustable—Nothing to adjust—therefore no after adjustments are necessary and there is no chance of adjustments being tampered with.

Noiseless—Nothing to vibrate, rattle or make any kind of noise, as the ball is the only moving part and is surrounded by a cushion of water, steam and air.

No Steam Leakage—A thin but constant water seal always prevents steam leakage.

Non-Air Binding—Free discharge of air and water permits radiators to heat up rapidly.

Capacity—Not affected by variation in temperature of water discharged.

Finished Appearance—The shape and size make the Johns-Manville Trap an attractive part of the heating system.

The owner, architect, engineer and operator will get full satisfaction because after installation perfect results are obtained without care or changes.

Steam-fitters and contractors will be relieved of all trouble after installation because of no after adjustments and a minimum of repairs and replacements.

See page 94 for list prices.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 100 of 154
asbestosclaims.law/library/21286/100

How to Specify a Johns-Manville Trap

Steam Traps

ALL steam traps required shall be suitable for pressures at which they must operate, and must discharge air as well as water without the aid of separate air passages. All traps are to be the non-attached rolling ball type, consisting of only three essential parts, the body, non-attached rolling ball and the discharge bushing. The hollow copper ball is to act as a valve to regulate the discharge from the trap, and is to be free to revolve or move in any direction, having no levers, rods, weights or valves of any description attached to it. The traps are to contain no thermostatic parts.

Radiator Trap or Valve

All radiator traps placed on the return side of the radiators or heating units shall have ½" connections and must discharge air as well as water without the aid of separate air passages. All traps shall be of the non-attached rolling ball type, consisting of only three essential parts, the body, non-attached rolling ball, and a union connection. The hollow copper ball which acts as a valve to regulate the discharge from the trap is to be the only moving part, is to act as a valve to regulate the discharge from the trap, and is to be free to revolve or move in any direction, having no levers, rods, weights or valves of any description attached to it. The radiator traps are to contain no thermostatic parts.

No other valve will be accepted in this specification unless approved by the Architects before the contract is placed.

If it is desired to specify Johns-Manville traps by their names, an additional paragraph should precede the other paragraphs on both steam and radiator trap specifications. This paragraph to read: "All traps to be Johns-Manville non-attached rolling ball type of trap."

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 101 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/101

A Few Prominent Users of Johns-Manville Steam Traps

Foreign

Honolulu Iron Works, Honolulu, T. H.

New England States

Bath Iron Works, Ltd., Bath, Me.
Morley Button Manufacturing Co., Portsmouth, N. H.
Brown Company, Berlin, N. H.
Central Vermont R. R., St. Albans, Vt.
Revere Sugar Refinery, Charlestown, Mass.
Swift & Company, Boston, Mass.
General Electric Company, Lynn & Pittsfield, Mass.
B. B. & R. Knight, Pontiac Mill, Providence, R. I.
Camp Devens, U. S. Army Cantonment, Ayer, Mass.
Cheney Bros., Inc., South Manchester, Conn.
Dennison Manufacturing Co., So. Framingham, Mass.
George E. Keith Company, Campello, Mass.

Middle Atlantic States

American Can Co., Edgewater, N. J.
American Locomotive Co., Cooks Works, Paterson, N. J.
American Oil Works, Titusville, Pa.
American Steel Foundries, Sharon, Pa.
American Steel & Wire Co., Pittsburgh, Pa.
American Sugar Refining Co., Brooklyn, N. Y.
Bethlehem Steel Co., Sparrows Point, Md.
Biltmore Hotel, New York City.
Boonton Rubber Co., Boonton, N. J.
Buffalo Bolt Co., Tonawanda, N. Y.
Carbon Steel Co., Pittsburgh, Pa.
Carnegie Steel Co., Pittsburgh, Pa.
Central Islip State Hospital, Central Islip, N. Y.
Chesapeake Belting Co., Baltimore, Md.
Colgate & Company, Jersey City, N. J.
Columbia University, New York City.
Commodore Hotel, New York City.
Consolidated Gas Co., New York City.
Crucible Steel Co., Pittsburgh, Pa.
De Laval Separator Co., Poughkeepsie, N. Y.
Dixon Crucible Co., Jersey City, N. J.
Edison, Thomas A., Inc., West Orange, N. J.
Equitable Life Assurance Society, New York City.
General Electric Company, Schenectady, N. Y.
Gulf Refining Co., Philadelphia, Pa.
Loose-Wiles Biscuit Co., Long Island City, N. Y.
Metropolitan Life Insurance Co., New York City.
National Biscuit Co., New York City.
Pressed Steel Car Co., Allegheny, Pa.
Sharpless Separator Co., West Chester, Pa.
Sheffield-Farms, Slawson Decker Co., New York City.
United States Military Academy, West Point, N. Y.
U. S. Navy Yard, Supply Dept., Philadelphia, Pa.
U. S. Naval Academy, Annapolis, Md.
Ward Baking Co., New York City.
Westinghouse-Church-Kerr Co., Kenilworth, N. J.

Southern

Anniston Cooperage Co., Anniston, Ala.
Dallas Mfg. Co., Huntsville, Ala.
Easley Cotton Mills, Liberty, S. C.
Farmers' Oil Mill, Anderson, S. C.
Gulfport & Mississippi Coast Traction Co., Gulfport, Miss.
Reynolds Tobacco Co., Winston-Salem, N. C.

Central States

Alamo Mfg. Co., Hillsdale, Mich.
American Car & Foundry Co., Detroit, Mich.
Ashland Leather Co., Ashland, Ky.
Atlas Cooperage, Fostoria, Ohio.
Aycock Hosiery Mills, So. Pittsburg, Tenn.
Battle Creek Sanitarium, Battle Creek, Mich.
Berea College, Berea, Ky.
Burroughs Adding Machine Co., Detroit, Mich.
Canaan Coal Co., Canaanville, Ohio.
Canton Drop Forging & Mfg. Co., Canton, Ohio.
Illinois Steel Co., Chicago, Ill.
Chicago Lake Shore & So. Bend Ry. Co., Michigan City, Ind.
Children's Free Hospital, Detroit, Mich.
Christopher Coal Mining Co., Christopher, Ill.
Continental Motors Corp., Muskegon, Mich.
Jas. S. Kirk Soap Co., Chicago, Ill.
Electric Rubber Reclaiming Co., Barberton, Ohio.
Favorite Stove & Range Co., Piqua, Ohio.
Fleishmann Co., Cincinnati, Ohio.
Ford Motor Car Co., Detroit, Mich.
Garford Motor Truck Co., Lima, Ohio.
Globe-Wernicke Co., Norwood, Cincinnati, Ohio.
N. K. Fairbanks Co., Chicago, Ill.
Montgomery Ward & Co., Chicago, Ill.
Hoover Steel Ball Co., Ann Arbor, Mich.
Independent Towel Supply Co., Cleveland, Ohio.
Jeffrey Mfg. Co., Columbus, Ohio.
Kellogg Toasted Corn Flakes Co., Battle Creek, Mich.
Michigan Chemical Co., Bay City, Mich.
Michigan Copper Mining Co., Rockland, Mich.
National Cash Register Co., Dayton, Ohio.
Old "76" Distilling Co., Newport, Ky.
Peerless Motor Car Co. Cleveland, Ohio.
Pullman Company, Pullman, Ill.
Willard Storage Battery Co., Cleveland, Ohio

Southwestern States

Armour & Company, Fort Worth, Texas.
Haile, J. T., San Antonio, Texas.
Hillman Refining Co., Cushing, Okla.
Kansas City Refining Co., Kansas City, Kans.
O'Fallon Supply Co., Denver, Colo.
Pittsburgh Plate Glass Co., Crystal City, Mo.
Point Milling & Mfg. Co., Mineral Point, Mo.
Southern Creosote Co., Slidell, La.

Northwestern States

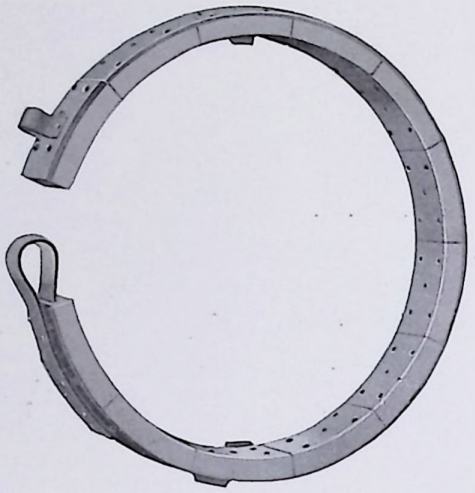
Chase Bannister Co., Ottumwa, Iowa.
City of Estherville, Estherville, Iowa.
Globe Machinery & Supply Co., Des Moines, Iowa.
Haarman Pickle & Vinegar Co., Omaha, Nebr.
Harvey Milling Co., Harvey, N. D.
Hennepin Laundry Co., Minneapolis, Minn.

Pacific States

Barton & Co., Seattle, Wash.
Western Industries Co., Agnew, Cal.
Winslow Marine Railway & Shipbuilding Co., Seattle, Wash.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 102 of 154
asbestosclaims.law/library/21286/102

Johns-Manville Asbesto-Metallic Friction Blocks



For friction brakes as used on hoists, cranes, steam shovels, dredges, and all similar machinery, also for friction clutches of all types, or for any braking or power transmitting duty where friction material is used.

MADE of selected asbestos fibre, brass wire, and a special binding compound, densely compacted together by vulcanizing under enormous pressure in metal molds to the exact form required.

Johns-Manville Asbesto-Metallic Friction Blocks wear many times longer than wood, leather and various other materials. Economy is effected not only on account of their durability, but by minimizing shut-downs and reducing time and labor made necessary by replacement of other forms of braking materials.

These blocks grip instantly and release quickly, yet do not shock or jar the machine to which they are applied. Machinery equipped with Johns-Manville Asbesto-Metallic Blocks is always under perfect control, as far as the brakes or frictions are concerned.

Johns-Manville Asbesto-Metallic Friction Blocks will not char, burn or cause fire, and are practically unaffected by moisture, heat or oily surfaces.

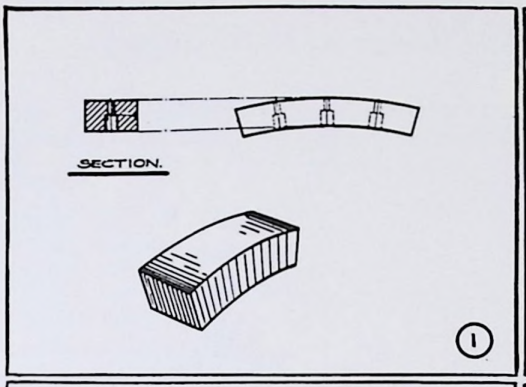
The high friction co-efficient or gripping power of these blocks means that less effort is necessary to control the machine on which they are applied than with other braking materials.

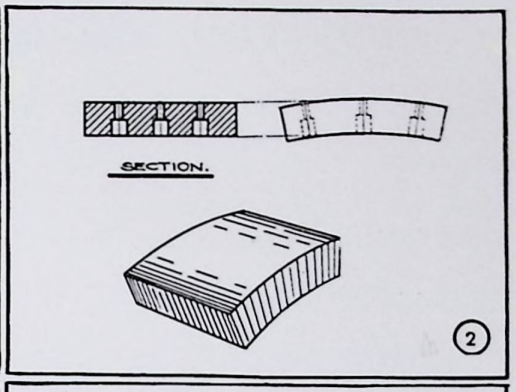
The friction co-efficient of Johns-Manville Asbesto-Metallic Friction Blocks remains more nearly constant than that of other materials, under adverse conditions, such as presence of oil, moisture, or excessive heat due to heavy service. This results in uniform braking action at all times, without frequent adjustment.

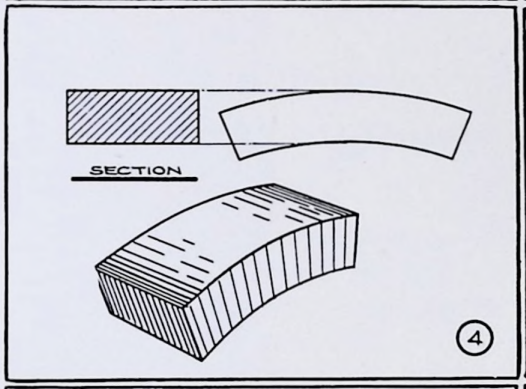
Due to its high heat-resisting properties and resistance to wear, this material can be used in smaller areas of friction surface than other materials.

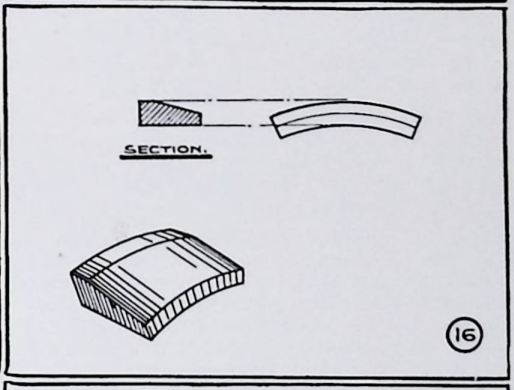
Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 103 of 154
asbestosclaims.law/library/21286/103

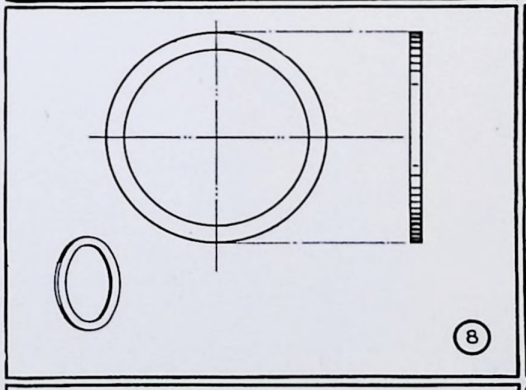
Various Forms in Which Asbesto-Metallic Friction Blocks Have Been Furnished

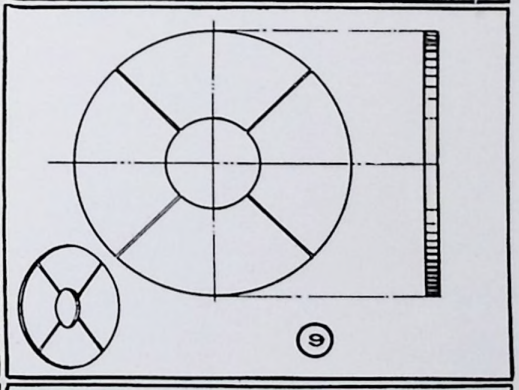


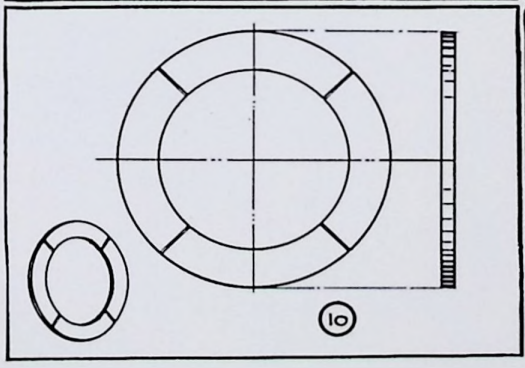












Description of Diagrams

Blocks Nos. 1, 2, 4, 16.—Types frequently used for steam-shovels, dredges, stationary hoists, coal-dock and mine-hoisting machinery.

Blocks Nos. 8, 9, 10.—Types frequently used for multiple disc clutches and brakes.

It is possible to mold Asbesto-Metallic Friction Blocks in a variety of forms for various services.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 104 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/104

Showing How and Where Johns-Manville Asbesto-Metallic Friction Blocks May Be Used

Sketches are not intended to show proper construction of clutch or brake mechanism, or of application of blocks, but only to show in general how and where our blocks may be used.

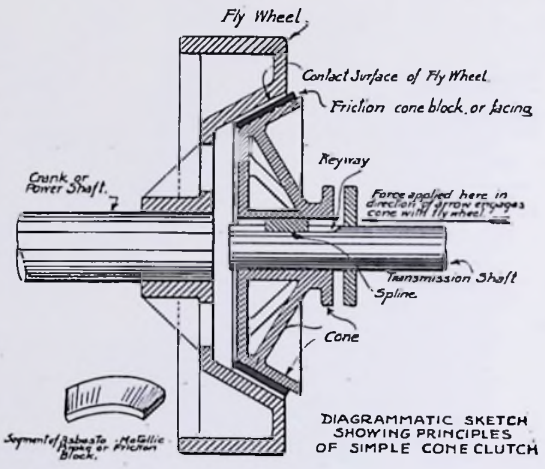
Description of Diagrams A, B, C

Diagram A.—Typical hoisting drum with brake and friction equipment. Lever throws friction block B, on revolving gear wheel, into contact with winding drum, transmitting power from gear to drum. When unwinding, drum is stopped by forcing iron band lined with brake blocks "A" against drum. Diagram "A" also shows asbestos blocks used as a facing on old wooden frictions. Facings are less expensive than complete V-shape blocks.

Diagram B.—Shows principle of simple cone clutch with Johns-Manville blocks used as facing. Power is transmitted from power to transmission shaft by forcing cone and facing into contact with fly-wheel. Pedal or lever controls cone.

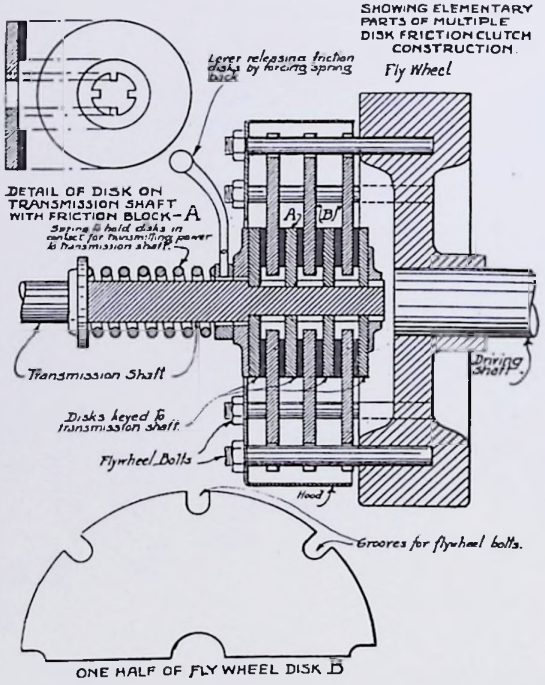
Diagram C.—Shows elementary principles of multiple disc clutch or brake. Discs "A" are keyed to transmission shaft; discs "B" are held to fly-wheel by slots cut in edges which fit around bolts. Power is transmitted or absorbed by forcing discs "A" and "B" together by a spring. Pressure is released by forcing spring back from discs with lever.

DIAGRAM B



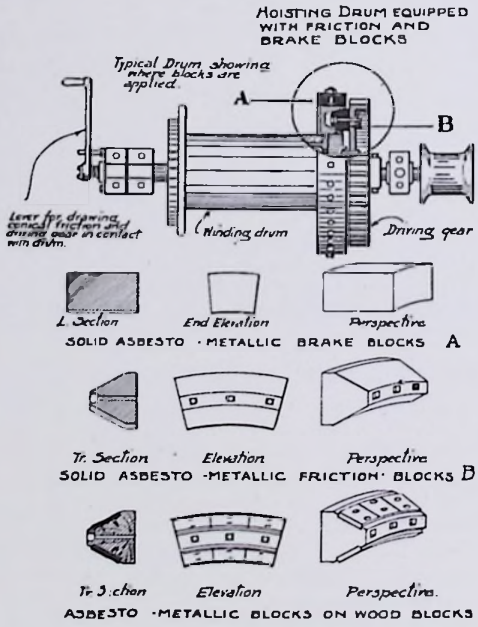
DIAGRAMMATIC SKETCH SHOWING PRINCIPLES OF SIMPLE CONE CLUTCH

DIAGRAM C



ONE HALF OF FLY WHEEL DISK B

DIAGRAM A



Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 105 of 154
asbestosclaims.law/library/21286/105

A Few Prominent Users of Johns-Manville Asbesto-Metallic Friction Blocks

Canadian

West Canadian Collieries, Ltd., Blairmore, Alta.
Granby Con. Mining, Smelting & Power Co., Grand Forks, B. C.
Church, Ross & Co., Trenton, Ont.
Dredging Dept. Dom. Govt., Ottawa, Ont.
Shoemacher Gold Mines, Shoemacher, Ont.
Dept. of Public Works, Sorel, Que.

New England States

Boston & Maine Railroad, Boston, Mass.
Revere Sugar Refinery, Boston, Mass.
The Stanley Works, Bridgewater, Mass.
The Barrett Company, Everett, Mass.
American Writing Paper Co., Holyoke, Mass.
American Woolen Co., Washington Mills, Lawrence, Mass.
The Lowell Elec. Light Corp., Lowell, Mass.
Massachusetts Cotton Mills, Lowell, Mass.
Eaton, Crane & Pike, Pittsfield, Mass.
Bethlehem Shipbuilding Corp., Quincy, Mass.
Gilbert & Barker Mfg. Co., Springfield, Mass.
Hood Rubber Company, Watertown, Mass.
U. S. War Dept. Watertown Arsenal, Watertown, Mass.
American Steel & Wire Co., Worcester, Mass.
Clinton-Wright Wire Co., Worcester, Mass.
The Texas Steamship Co., Bath, Me.
Pejepscot Paper Co., Brunswick, Me.
S. D. Warren Company, Cumberland Mills, Me.
Goodall Worsted Company, Sanford, Me.
Eastern Mfg. Co., So. Brewer, Me.
The Esmond Mills, Esmond, R. I.
Union Wadding Company, Pawtucket, R. I.
U. S. Finishing Company, Pawtucket, R. I.
Sayles Bleacheries, Saylesville, R. I.
Amoskeag Mfg. Company, Manchester, N. H.
The New London Ship & Engine Co., Groton, Conn.
American Thread Company, Willimantic, Conn.
U. S. Finishing Company, Norwich, Conn.

Middle Atlantic States

Public Service Company, Newark, N. J.
Robins Conveying Belt Co., Passaic, N. J.
Buffalo Dry Dock, Buffalo, N. Y.
Witherbee Sherman Company, Minerville, N. Y.
Geo. B. Spearin & Co., New York City, N. Y.
New York Edison Co., New York City, N. Y.
New York Mills, New York City, N. Y.
General Electric Company, Schenectady, N. Y.
Atlas Portland Cement Company, New York City, N. Y.
Manhattan Sand & Gravel Company, New York City, N. Y.
Henry Steers & Company, New York City, N. Y.
Hutchinson Car Roof Company, Hyde Park, Penn.
U. S. Steel Corporation, Pittsburgh, Penn.
Rogers Sand Company, Pittsburgh, Penn.
Iron City Sand Company, Pittsburgh, Penn.
M. K. Davidson Company, Pittsburgh, Penn.
Valley Forging Company, Verona, Penn.
Hudson Coal Company, Scranton, Penn.
Pennsylvania Coal Company, Scranton, Penn.
Lehigh Coal & Navigation Co., Philadelphia, Penn.
Scranton Coal Co., Scranton, Penn.
Bethlehem Shipbuilding Co., Bethlehem, Penn.
New York Shipbuilding Co., Camden, N. J.
American International Shipbuilding Co., Hog Island, Penn.
Merchants Shipbuilding Co., Bristol, Penn.
Baltimore Dry Dock & Shipbuilding Co., Baltimore, Md.
Wm. Cramp & Sons Ship & Engine Bldg. Co., Phila., Penn.
Bethlehem Steel Company, Bethlehem, Penn.
Columbia Granite & Dredging Co., Washington, D. C.
Hainesport Mining & Transportation Co., Philadelphia, Penn.
West Virginia Pulp & Paper Co., Tyrone, Penn.
Vulcan Iron Works, Wilkes-Barre, Penn.

Southern States

Tenn. Coal, Iron & R. R. Co., Birmingham, Ala.
Savannah River Lumber Company, Savannah, Ga.
Bowers Southern Dredging Co., Miami, Fla.
Prairie Pebble Phosphate Co., Mulberry, Fla.
Republic Iron & Steel Co., Birmingham, Ala.

Central States

International Harvester Co., Chicago, Ill.
Utah Idaho Sugar Company, Salt Lake City, Utah.
Steel Tube Company of America, Chicago, Ill.
American Bridge Company, Chicago, Ill.
By-Products Coke Corp., Chicago, Ill.
Illinois Steel Company, Chicago, Ill.
Cutler-Hammer Mfg. Company, Milwaukee, Wis.
Allis-Chalmers Mfg. Company, Milwaukee, Wis.
Seng Company, Chicago, Ill.
Pawling & Harnischfeger, Milwaukee, Wis.
Milwaukee Elec. Crane Mfg. Company, Milwaukee, Wis.
Nordberg Mfg. Company, Milwaukee, Wis.
Milwaukee Western Fuel Co., Milwaukee, Wis.
A. C. Smith Corporation, Milwaukee, Wis.
C. Reiss Coal Company, Sheboygan, Wis.
Milwaukee Gas & Light Company, Milwaukee, Wis.
U. S. Crushed Stone Company, Chicago, Ill.
U. S. Gypsum Company, Chicago, Ill.
Liberty Fuel Company, Salt Lake City, Utah.
Charcoal Iron Company of America, Ishpeming, Mich.
Industrial Works, Bay City, Mich.
Pickands Mather Company, Cleveland, Ohio.
McMyler Inter-State Co., Bedford, Ohio.
Cons. Water Power & Paper Co., Grand Rapids, Mich.
Brown Hoisting Mach. Co., Cleveland, Ohio.
Wellman-Seaver Morgan Company, Cleveland, Ohio.
Dixie Portland Cement Co., Richard City, Tenn.
Lucey Mfg. Company, Chattanooga, Tenn.

Southwestern States

American Well & Prospecting Company, Corsicana, Tex.
Carterville Sheet Metal Works, Carterville, Mo.
United States Engineers, Galveston, Texas.
The Barrett Company, St. Louis, Mo.
Kochtitzky & Warner, Cape Girardeau, Mo.
Laclede Gas Light Company, St. Louis, Mo.
American Zinc, Lead & Smelting Co., St. Louis, Mo.

Northwestern States

Oliver Iron Mining Company, Duluth, Minn.
A. Guthrie & Company, St. Paul, Minn.
Calumet & Hecla Mining Company, Calumet, Mich.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 106 of 154
asbestosclaims.law/library/21286/106

Pacific States

Kennecott Copper Corp., Kennecott, Alaska.
Alaska Gastineau Mfg. Company, Juneau, Alaska.
Brooks-Scanlon Lumber Co., Bend, Oregon.
Hyde Coal Company, Cumberland, Wash.
Shevlin-Hixon Lumber Co., Bend, Oregon.
Wilkeson Coal & Coke Co., Wilkeson, Wash.
Columbia Digger Company, Portland, Oregon.
Pacific Coast Steel Co., Youngstown Sta., Seattle, Wash.
Simpson Logging Company, Shelton, Wash.
Port of Astoria, Astoria, Ore.
Union Lumber Company, Union Mills, Wash.
Carbon Hill Coal Company, Carbonado, Wash.

Granby Cons. Mfg. & Smelting Co., Anyox, B. C.
Granby Cons. Mfg. & Smelting Co., Phoenix, B. C.
Granby Cons. Mfg. & Smelting Co., Grand Forks, B. C.
Granby Cons. Mfg. & Smelting Co., Cassidy, B. C.
Western Fuel Co., Nansimo, B. C.
Cons. Mining & Smelting Co., Trail, B. C.
Britannia Mfg. & Smelting Co., Britannia, B. C.
Yukon Gold Company, Yukon Territory
Niles Sand & Gravel Co., Niles, Cal.
Honolulu Cons. Oil Co., Taft, Cal.
Republic Well Supply Co., Taft, Cal.
Western Sugar Refining Co., San Francisco, Cal.
Associated Oil Co., San Francisco, Cal.

Johns-Manville Non-Burn Brake-Band Lining

For industrial use

WHERE machine design prevents the use of blocks, we recommend Johns-Manville Non-Burn Brake-Band Lining.

Johns-Manville Non-Burn Brake-Band Lining is made of asbestos fibre spun into yarn, reinforced with wires interwoven in each strand, and impregnated with a compound which greatly increases its natural frictional and wearing qualities.

It is not affected by frictional heat which chars and burns ordinary brake lining, or weakened by grease or oils which so quickly put an end to brake linings containing organic or vegetable matter.

List Prices Per Foot

Furnished in Two Styles—Folded and Stitched, or Woven.

NOTE.—The following list covers widths and thicknesses usually used for machinery purposes. Folded and Stitched Style can be furnished in all sizes listed. Woven Style can be furnished in all widths listed, providing thickness does not exceed 5/16".

Width	1/8" Thick	5/32" Thick	3/16" Thick	1/4" Thick	5/16" Thick	3/8" Thick	1/2" Thick	5/8" Thick	3/4" Thick	7/8" Thick	1" Thick
1 "	$ .40	$ .45	$ .50	$ .70	$ .80	$ .96	$1.22	$1.48	$1.73	$1.99	$2.24
1¼"	.50	.55	.60	.80	.94	1.16	1.48	1.80	2.12	2.44	2.76
1½"	.60	.65	.70	.90	1.11	1.35	1.73	2.12	2.50	2.88	3.27
1¾"	.70	.75	.80	1.00	1.26	1.54	1.99	2.44	2.88	3.33	3.78
2 "	.80	.85	.90	1.20	1.41	1.73	2.24	2.76	3.27	3.78	4.29
2¼"	.90	.95	1.00	1.30	1.56	1.92	2.50	3.08	3.65	4.23	4.80
2½"	1.00	1.05	1.10	1.50	1.72	2.12	2.76	3.40	4.04	4.68	5.32
2¾"	1.10	1.15	1.20	1.60	1.87	2.31	3.01	3.72	4.42	5.12	5.83
3 "	1.20	1.25	1.30	1.70	2.02	2.50	3.27	4.04	4.80	5.57	6.34
3¼"	1.25	1.35	1.40	1.80	2.16	2.69	3.52	4.36	5.19	6.02	6.85
3½"	1.30	1.45	1.50	1.90	2.21	2.88	3.78	4.68	5.57	6.47	7.36
3¾"	1.35	1.50	1.60	2.05	2.31	3.08	4.04	5.00	5.96	6.92	7.88
4 "	1.40	1.55	1.70	2.20	2.50	3.27	4.29	5.32	6.38	7.36	8.39
4¼"	1.73	1.85	1.97	2.37	2.71	3.46	4.55	5.64	6.72	7.81	8.90
4½"	1.80	1.94	2.08	2.50	2.92	3.65	4.80	5.96	7.11	8.26	9.41
4¾"	1.86	2.03	2.19	2.63	3.07	3.84	5.06	6.28	7.49	8.71	9.92
5 "	1.92	2.11	2.29	2.70	3.22	4.04	5.32	6.60	7.88	9.16	10.44
5¼"	2.02	2.21	2.40	2.88	3.36	4.23	5.57	6.92	8.26	9.60	10.95
5½"	2.12	2.31	2.50	3.01	3.52	4.42	5.83	7.24	8.64	10.05	11.46
5¾"	2.21	2.40	2.60	3.14	3.67	4.61	6.08	7.56	9.03	10.50	11.97
6 "	2.27	2.49	2.71	3.27	3.82	4.80	6.34	7.88	9.41	10.95	12.48
6¼"	2.64	2.90	3.15	3.80	4.44	5.00	6.60	8.20	9.80	11.40	13.00
6½"	2.72	3.03	3.34	3.94	4.61	5.19	6.85	8.52	10.18	11.84	13.51
6¾"	2.79	3.09	3.40	4.08	4.78	5.38	7.11	8.84	10.56	12.29	14.02
7 "	2.86	3.18	3.49	4.20	4.95	5.57	7.36	9.16	10.95	12.69	14.53
7¼"	2.97	3.31	3.65	4.37	5.12	5.76	7.62	9.48	11.33	13.19	15.04
7½"	3.08	3.44	3.80	4.52	5.28	5.96	7.88	9.80	11.72	13.64	15.56
7¾"	3.15	3.51	3.87	4.66	5.46	6.15	8.13	10.12	12.10	14.08	16.07
8 "	3.22	3.59	3.96	4.80	5.63	6.34	8.39	10.44	12.48	14.53	16.58
8¼"	3.33	3.72	4.10	4.95	5.80	6.53	8.64	10.76	12.87	14.98	17.09
8½"	3.44	3.80	4.23	5.09	5.96	6.72	8.90	11.08	13.25	15.43	17.60
8¾"	3.51	3.93	4.28	5.24	6.13	6.92	9.16	11.40	13.64	15.88	18.12

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 107 of 154
asbestosclaims.law/library/21286/107

List Prices Per Foot—(Continued)

Furnished in Two Styles—Folded and Stitched, or Woven

NOTE.—The following list covers widths and thicknesses usually used for machinery purposes. Folded and Stitched Style can be furnished in all sizes listed. Woven Style can be furnished in all widths listed, providing thickness does not exceed $\frac{5}{16}$".

Width	1/8" Thick	3/16" Thick	1/4" Thick	5/16" Thick	3/8" Thick	1/2" Thick	5/8" Thick	3/4" Thick	7/8" Thick	1" Thick
9 "	$3.58	$4.00	$4.43	$5.38	$6.30	$7.11	$9.41	$11.72	$14.02	$16.32	$18.63
9¼"	3.69	4.13	4.57	5.52	6.47	7.30	9.67	12.04	14.40	16.77	19.14
9½"	3.80	4.26	4.72	5.67	6.64	7.49	9.92	12.36	14.79	17.22	19.65
9¾"	3.87	4.36	4.86	5.81	6.81	7.68	10.18	12.68	15.17	17.67	20.16
10 "	3.94	4.42	4.90	5.96	6.98	7.88	10.44	13.00	15.56	18.12	20.68
10¼"	4.05	4.53	5.02	6.10	7.15	8.07	10.69	13.32	15.94	18.56	21.19
10½"	4.16	4.64	5.13	6.24	7.32	8.26	10.95	13.64	16.32	19.01	21.70
10¾"	4.23	4.74	5.24	6.39	7.48	8.45	11.20	13.96	16.71	19.46	22.21
11 "	4.30	4.84	5.36	6.53	7.65	8.64	11.46	14.28	17.09	19.91	22.72
11¼"	4.41	4.95	5.49	6.68	7.83	8.84	11.72	14.60	17.48	20.36	23.24
11½"	4.52	5.06	5.61	6.82	8.00	9.03	11.97	14.92	17.86	20.80	23.75
11¾"	4.59	5.16	5.74	6.96	8.16	9.22	12.23	15.24	18.24	21.25	24.26
12 "	4.66	5.24	5.84	7.11	8.33	9.41	12.48	15.56	18.63	21.70	24.77
12¼"	4.76	5.36	5.96	7.25	8.50	9.60	12.74	15.88	19.01	22.15	25.28
12½"	4.85	5.46	6.07	7.40	8.68	9.80	13.00	16.20	19.40	22.60	25.80
12¾"	4.96	5.57	6.19	7.54	8.84	9.99	13.25	16.52	19.78	23.04	26.31
13 "	5.06	5.68	6.31	7.68	9.02	10.18	13.51	16.84	20.16	23.49	26.82
13¼"	5.15	5.79	6.43	7.83	9.19	10.37	13.76	17.16	20.55	23.94	27.33
13½"	5.25	5.89	6.54	7.97	9.36	10.56	14.02	17.48	20.93	24.39	27.84
13¾"	5.35	6.00	6.66	8.12	9.53	10.76	14.28	17.80	21.32	24.84	28.36
14 "	5.45	6.11	6.78	8.26	9.70	10.95	14.53	18.12	21.70	25.28	28.87
14¼"	5.55	6.22	6.90	8.40	9.87	11.14	14.79	18.44	22.08	25.73	29.38
14½"	5.64	6.33	7.02	8.55	10.04	11.33	15.04	18.76	22.47	26.18	29.89
14¾"	5.75	6.44	7.14	8.69	10.21	11.52	15.30	19.08	22.85	26.63	30.40
15 "	5.85	6.56	7.26	8.84	10.39	11.72	15.56	19.40	23.24	27.08	30.92
15¼"	5.94	6.66	7.37	8.98	10.54	11.91	15.81	19.72	23.62	27.52	31.43
15½"	6.04	6.76	7.48	9.12	10.72	12.10	16.07	20.04	24.00	27.97	31.94
15¾"	6.14	6.87	7.60	9.27	10.90	12.29	16.32	20.36	24.39	28.42	32.45
16 "	6.24	6.97	7.71	9.41	11.07	12.48	16.58	20.68	24.77	28.87	32.96
16¼"	6.33	7.08	7.83	9.56	11.24	12.68	16.84	21.00	25.16	29.32	33.48
16½"	6.43	7.19	7.95	9.70	11.40	12.87	17.09	21.32	25.54	29.76	33.99
16¾"	6.52	7.29	8.08	9.84	11.56	13.06	17.35	21.64	25.92	30.21	34.50
17 "	6.60	7.40	8.20	9.99	11.73	13.25	17.60	21.96	26.31	30.66	35.01
17¼"	6.70	7.51	8.32	10.13	11.90	13.44	17.86	22.28	26.69	31.11	35.52
17½"	6.80	7.61	8.45	10.28	12.07	13.64	18.12	22.60	27.08	31.56	35.78
17¾"	6.90	7.72	8.55	10.42	12.24	13.83	18.37	22.92	27.46	32.00	36.55
18 "	7.00	7.83	8.67	10.56	12.40	14.02	18.63	23.24	27.84	32.45	37.06
18¼"	7.08	7.93	8.78	10.71	12.57	14.21	18.88	23.56	28.23	32.90	37.57
18½"	7.16	8.03	8.88	10.85	12.74	14.40	19.14	23.88	28.61	33.35	38.08
18¾"	7.24	8.12	9.01	11.00	12.92	14.60	19.40	24.20	29.00	33.80	38.60
19 "	7.32	8.23	9.13	11.14	13.08	14.79	19.65	24.52	29.38	34.24	39.11
19¼"	7.41	8.33	9.25	11.28	13.25	14.98	19.91	24.84	29.76	34.69	39.62
19½"	7.51	8.43	9.36	11.43	13.44	15.17	20.16	25.16	30.15	35.14	40.13
19¾"	7.60	8.53	9.48	11.57	13.60	15.36	20.42	25.48	30.53	35.59	40.64
20 "	7.68	8.64	9.60	11.72	13.76	15.56	20.68	25.80	30.92	36.06	41.16
20¼"	7.77	8.74	9.72	11.86	13.93	15.75	20.93	26.12	31.30	36.48	41.67
20½"	7.87	8.84	9.83	12.00	14.10	15.94	21.19	26.44	31.68	36.93	42.18
20¾"	7.96	8.95	9.94	12.15	14.27	16.13	21.44	26.76	32.07	37.38	42.69
21 "	8.04	9.06	10.07	12.29	14.44	16.32	21.70	27.08	32.45	37.83	43.20
21¼"	8.13	9.16	10.19	12.44	14.60	16.52	21.96	27.40	32.84	38.28	43.72
21½"	8.23	9.26	10.30	12.58	14.78	16.71	22.21	27.72	33.22	38.72	44.23
21¾"	8.32	9.36	10.43	12.72	14.95	16.90	22.47	28.04	33.60	39.17	44.74
22 "	8.40	9.47	10.53	12.87	15.12	17.09	22.72	28.36	33.99	39.62	45.25
22¼"	8.49	9.57	10.65	13.01	15.28	17.28	22.98	28.68	34.37	40.07	45.76
22½"	8.59	9.68	10.77	13.16	15.46	17.48	23.24	29.00	34.76	40.52	46.28
22¾"	8.68	9.78	10.88	13.30	15.62	17.67	23.49	29.32	35.14	40.96	46.79
23 "	8.76	9.88	11.00	13.44	15.79	17.86	23.75	29.64	35.52	41.41	47.30
23¼"	8.85	9.99	11.12	13.59	15.96	18.05	24.00	29.96	35.91	41.86	47.81
23½"	8.95	10.09	11.25	13.73	16.13	18.24	24.24	30.28	36.29	42.31	48.32
23¾"	9.04	10.20	11.36	13.88	16.30	18.44	24.52	30.60	36.68	42.76	48.84
24 "	9.12	10.30	11.47	14.02	16.47	18.63	24.77	30.92	37.06	43.20	49.35

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 108 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/108

Johns-Manville Aertite Boiler Wall Coating

A tough, rubbery coating in plastic form for covering the outside of boiler walls to prevent the infiltration of cold air into the combustion chamber.

INSULATION (in sheet or block form) properly applied to boiler walls prevents both infiltration of air through the wall and into the boiler and radiation of heat from the walls.

If insulation which prevents both losses is not applied, the infiltration of air into the boiler can be eliminated at a comparatively small expense by the application of Johns-Manville Aertite Boiler Wall Coating.

Every crack or crevice in the boiler setting allows just so much cold air to seep through and mix with the flue gases.

Cold air that leaks in absorbs heat until it reaches the temperature of the furnace gases and hence wastes heat that would otherwise perform useful work. It is conservative to estimate on the following basis—if air leakage through boiler walls amounts to *only* 5% of actual quantity of air required for proper combustion and high efficiency—1% of the fuel burned is wasted. Leakage often amounts to more than 100% and 100% leakage causes fuel wastage of at least 20%.

Cracks in boiler walls may not be very apparent, yet may allow leakage enough to materially lower boiler efficiency.

Johns-Manville Aertite Boiler Wall Coating, applied to the outside of the boiler wall, entirely eliminates air infiltration. It provides a tough, rubbery coating or blanket over the entire boiler setting which remains tight on account of its adhesive and ductile qualities.

It is easily applied by troweling on the outside of boiler walls. The best results are obtained by keeping the thickness as near 1/16" as possible.

The quantity required to cover 100 square feet depends upon the number and variety of cracks and the way the wall has been pointed up. For 1/16" thickness it will take approximately 25 to 40 lbs. per 100 square feet.

Johns-Manville Aertite Boiler Wall Coating is furnished in 25, 50, 100 and 200 lb. packages, either wood or steel friction top drums; and in 400 lb. wood barrels. Prices on application.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 109 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/109

Johns-Manville Transite Asbestos Wood

JOHNS-MANVILLE Transite Asbestos Wood is recommended as a fireproof building material to be used instead of wood in all places where fire is a menace. This material is an all-mineral composition of asbestos fibres and binding cements—does not rot or rust, and is not likely to warp, chip or buckle under service conditions.

Transite Asbestos Wood can be cut and worked by any carpenter and can be fastened with nails or screws. In the rough it presents a gray surface, which requires no painting or other protection against weather. It can, however be sanded or finished, and painted, varnished or grained in remarkably true imitation of slate, marble or hard wood.

Transite Asbestos Wood is fireproof and has withstood severe fire tests without being warped, distorted or weakened in any way. These tests have also demonstrated that the material is unaffected by water when thrown upon it in a heated condition, thus proving its adaptability for fire doors.

Transite Asbestos Wood in addition to being fireproof, is permanently moisture-resisting, and is not affected by extremes of temperature from the coldest to the hottest weather. Climatic changes harden and toughen it, and after a period of time it becomes impervious to the elements, making it adaptable for many purposes where ordinary wood could not be used. Its weight, as compared with tiling, slate, etc., is much in its favor, as the supporting framework can be made of much lighter material, giving greater interior space and reducing the cost of the structure.

Making not only walls, floors and ceilings fireproof, but also window casings, partitions, base boards, cabinets and other trim, is a task easily accomplished by the use of Transite Asbestos Wood. It is now widely employed in hospitals, libraries, and large public buildings, railway stations, residences, factories, foundries, machine shops, garages—to mention but a part of the long list. In one or more of the following forms Johns-Manville Transite Asbestos Wood is used in practically every type of permanent structure.

- Roofing
- Sheathing
- Window casings
- Moldings
- Cabinets
- Tank linings
- Ceiling
- Flooring
- Battens
- Boxes and Receptacles
- Wainscoting
- Fire doors
- Base boards
- Fire partitions
- Portable houses
- Counter and table tops
- Laboratory cabinets and trim
- Lining and partitions for shell-loading buildings
- Fume ventilators
- Flooring around stoves
- Enamel oven linings
- Bank vault linings
- Dental tables
- Siding sheets under steel sash
- Fire screens
- Dryer rooms in rubber and automobile plants
- Shelves for dry kiln carriers
- Film storage cabinets
- Gable ends of houses
- Lumber kiln linings
- Sulphur house linings
- Sleeping porches
- Office partitions
- Toilet room partitions
- Discs for fan bases
- Railway signal wire boxing
- Barriers of all sorts for fire protection from electrical apparatus

Weights and List Prices of Transite Asbestos Wood

This material is supplied in standard sized sheets, 36″x48″, 42″x48″ and 42″x96″, in all thicknesses.

Thickness	Weight per Square Foot	List Price per Square Foot	Thickness	Weight per Square Foot	List Price per Square Foot
1/8″	1.41 lbs.	$0.15	5/8″	6.7 lbs.	$0.75
3/16″	2.	.22½	3/4″	7.6	.90
1/4″	2.65	.30	7/8″	8.75	1.05
5/16″	3.28	.38	1″	9.93	1.20
3/8″	3.91	.45	1¼″	12.8	1.50
7/16″	4.41	.53	1½″	14.	1.80
1/2″	4.7	.60	1¾″	16.8	2.10
9/16″	6.	.70	2″	19.65	2.40

All quotations F. O. B. Factory.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 110 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/110

Johns-Manville Ebony Asbestos Wood

JOHNS-MANVILLE Ebony Asbestos Wood is recommended for use as an insulating base for switchboards, panel boards, bus bar barriers, switch bases and in other applications which these will readily suggest to the electrical man. It is offered in the form of composition sheets made up of asbestos fibre and binding cements and densely impregnated under heat and pressure into a compound of very high dielectric strength.

This material possesses the least possible surface leakage, being affected neither by oil nor atmospheric moisture, nor will it rot or rust even when exposed to the action of water, gas, oil, chemicals or ordinary acids. Although comparatively light in weight, Ebony Asbestos Wood has great physical strength due to its fibrous structure, hence is free from ruptures due to rapid temperature changes. It will withstand heat up to a temperature of 500 degrees F. and is not likely to warp, shrink, crack or buckle under extreme service conditions. This strength is an important factor when the loss due to handling more fragile materials is considered, and its lightness is in its favor both on the basis of mechanical strength and the saving of freight charges.

Johns-Manville Ebony Asbestos Wood is taking the place of slate, porcelain and Alberene stone in hundreds of plants for hundreds of different uses. Why? Because it will last indefinitely. Because it will not break up under the high voltage encountered in your plant. Because it will not warp, shrink, crack or buckle under extreme service conditions.

Take the Dinkey Controller, for instance. It is now used in many large steel mills in the Pittsburgh District. Designed for heavy duty with closely mounted contacts, neither slate nor Alberene stone of the required 1½" thickness could stand up under the severe service required of the face plate. Result—Ebony Asbestos Wood is used exclusively.

Johns-Manville Ebony Asbestos Wood has also been used with great success as insulators for collector rails on ore bridges, charging and drawing machines in coke plants, for third rails on top of coke ovens, and insulators for collector rails on all kinds of cranes.

These are only a few typical uses of Johns-Manville Ebony Asbestos Wood in industrial plants. There are uses in your plant—find them—and increase your production by reducing breakdowns to a minimum.

For years the chemical industry has been looking for an ideal material for laboratory table tops, sink tops, lining hoods over hot tables, and cabinet hood linings. The perfect material would be one which would be impervious to chemicals, acids and acid fumes, one that would not break glass containers on account of temperature change when they are put down, while hot.

The ideal material has been discovered in Johns-Manville Ebony Asbestos Wood.

This partial list of uses of Johns-Manville Ebony Asbestos Wood may suggest how this wonderfully efficient material may be of service in your plant.

- Disconnecting switch bases for lightning arresters
- Primary Fuse Boxes
- Washers to separate bus rings
- Terminal Blocks, motors and generators
- Back board controllers
- Charging rheostats
- Theatre pockets
- Theatre expansion plugs
- Theatre boxes and clusters
- Button switch boxes
- Wattmeter bases
- Ground petticoat and line insulators
- Lightning arrester boxes
- Panels for switchboards
- Switch barriers
- Faces for rheostats of all kinds
- Electric elevator controls
- Shunt bases
- Fuse blocks
- Exciter panels
- Cabinets for distant control of oil switches
- Converter panels
- Barriers to separate units
- Wire cleats
- Divided cleats
- Bus bar supports
- Resistance boxes
- Distributing boards
- Linings of cabinets
- Mercury arc rectifier panels
- Solenoid switches
- Back connected switches
- Cabinets
- Small wire holders for instrument connections
- Dinkey controllers

Weights and List Prices

This material is supplied in standard size sheets 36"x48" and 42"x96" in the following thicknesses

Thickness	Weight per Square Foot	List Price per Square Foot	Thickness	Weight per Square Foot	List Price per Square Foot
1/8"	1.5 lbs.	$0.90	3/4"	7.85 lbs.	$2.50
3/16"	2.08 "	1.20	7/8"	9. "	2.65
1/4"	2.75 "	1.30	1 "	10.35 "	2.80
5/16"	3.5 "	1.45	1 1/4"	12.85 "	3.10
3/8"	4.25 "	1.60	1 1/2"	15. "	3.65
1/2"	5.43 "	1.90	1 3/4"	17.8 "	3.95
5/8"	6.88 "	2.35	2 "	20.65 "	6.20

All Quotations F. O. B. Factory. Prices on thicknesses above 2" on application.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920) Published by AsbestosClaims.Law
ACL Doc 21286 · Page 111 of 154 asbestosclaims.law/library/21286/111

Noark Enclosed Fuses

National Electrical Code Standard

THE fuses shown are of the latest and most approved design and conform strictly to the rulings and recommendations of the Underwriters' Laboratories, Inc., after examination under the provisions of the National Electrical Code.

Noark Fuses are unequalled by any other on the market and represent the highest development in Fuses of the enclosed type. Their remarkable efficiency, durability and accuracy have won for them a world-wide reputation. Being designed on strictly scientific lines, they never fail to blow at the proper time and under the exact conditions claimed—thus affording absolute protection at all times.

Noark Fuses have a definite and accurate time interval of operation, varying from a few seconds on heavy overloads to the infinitesimal part of a second on a dead short circuit. As a result, these fuses are far more economical to use than any other—even the cheapest form of open fuse—on account of requiring less frequent replacement.

The list prices following are subject to liberal discounts, which will be quoted on application.

250 Volts 1-60 Amps.



Catalog Number	Amps.	Length Inches	Carton Quantity	Standard Package Quantity	List Price Each	Refilling List Price Each
2600	1	2	10	100	$0.25	
2601	2	2	10	100	.25	
2602	3	2	10	100	.25	
2603	4	2	10	100	.25	
2604	5	2	10	100	.25	
2605	6	2	10	100	.25	
2606	7	2	10	100	.25	
2607	8	2	10	100	.25	
2608	9	2	10	100	.25	
2609	10	2	10	100	.25	
2610	12	2	10	100	.25	
2611	15	2	10	100	.25	
2612	20	2	10	100	.25	
2613	25	2	10	100	.25	
2614	30	2	10	100	.25	
2615	35	3	10	100	.35	
2616	40	3	10	100	.35	
2617	45	3	10	100	.35	
2618	50	3	10	100	.35	
2619	55	3	10	100	.35	
2620	60	3	10	100	.35	

Not Refillable

250 Volts 65-400 Amps.



Catalog Number	Amps.	Length Inches	Carton Quantity	Standard Package Quantity	List Price Each	Refilling List Price Each
2650	65	5 7/8	5	50	$0.90	$0.60
2651	70	5 7/8	5	50	.90	.60
2652	75	5 7/8	5	50	.90	.60
2653	80	5 7/8	5	50	.90	.60
2654	85	5 7/8	5	50	.90	.60
2655	90	5 7/8	5	50	.90	.60
2656	95	5 7/8	5	50	.90	.60
2657	100	5 7/8	5	50	.90	.60
2658	110	7 1/8	5	25	2.00	.90
2659	125	7 1/8	5	25	2.00	.90
2660	150	7 1/8	5	25	2.00	.90
2661	175	7 1/8	5	25	2.00	.90
2662	200	7 1/8	5	25	2.00	.90
2663	225	8 5/8	2	25	3.60	1.50
2664	250	8 5/8	2	25	3.60	1.50
2665	275	8 5/8	2	25	3.60	1.50
2666	300	8 5/8	2	25	3.60	1.50
2667	325	8 5/8	2	25	3.60	1.50
2668	350	8 5/8	2	25	3.60	1.50
2669	375	8 5/8	2	25	3.60	1.50
2670	400	8 5/8	2	25	3.60	1.50

Different capacities cannot be combined to make Standard Package Quantities.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 112 of 154
asbestosclaims.law/library/21286/112

250 Volts 450-1000 Amps.



Catalog Number	Amps.	Length Inches	Carton Quantity	Standard Package Quantity	List Price Each	Refilling List Price Each
2671	450	10 3/8	2	10	5.50	2.00
2672	500	10 3/8	2	10	5.50	2.00
2673	550	10 3/8	2	10	5.50	2.00
2674	600	10 3/8	2	10	5.50	2.00
*2675	650	11 1/2	1	10	12.00	4.00
*2676	700	11 1/2	1	10	12.00	4.00
*2677	750	11 1/2	1	10	12.00	4.00
*2678	800	11 1/2	1	10	12.00	4.00
*2679	850	12 5/8	1	10	15.00	5.00
*2680	900	12 5/8	1	10	15.00	5.00
*2681	950	12 5/8	1	10	15.00	5.00
*2682	1000	12 5/8	1	10	15.00	5.00

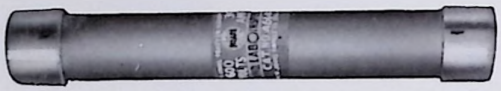
*Not approved by the Underwriters' Laboratories.

Noark Approved Plug Fuse Casings

250 Volts 1-60 Amps.
For Use in Edison Plug Cutout Bases

Catalog Number	Interchangeable Fuse Capacity for National Standard Fuses	Carton Quantity	Standard Package Quantity	List Price Each
2598	0-30 Amps.	10	100	$0.18
2599	31-60 Amps	10	100	.36

600 Volts 1-60 Amps.



Catalog Number	Amps.	Length Inches	Carton Quantity	Standard Package Quantity	List Price Each	Refilling List Price Each
4600	1	5	10	100	$0.40	
4601	2	5	10	100	.40	
4602	3	5	10	100	.40	
4603	4	5	10	100	.40	
4604	5	5	10	100	.40	
4605	6	5	10	100	.40	
4606	7	5	10	100	.40	
4607	8	5	10	100	.40	
4608	9	5	10	100	.40	
4609	10	5	10	100	.40	
4610	12	5	10	100	.40	
4611	15	5	10	100	.40	
4612	20	5	10	100	.40	
4613	25	5	10	100	.40	
4614	30	5	10	100	.40	
4615	35	5 1/2	10	100	.60	
4616	40	5 1/2	10	100	.60	
4617	45	5 1/2	10	100	.60	
4618	50	5 1/2	10	100	.60	
4619	55	5 1/2	10	100	.60	
4620	60	5 1/2	10	100	.60	

Not Refillable

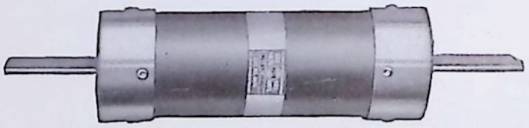
Different capacities cannot be combined to make standard package quantities.

600 Volts 65-400 Amps.



Catalog Number	Amps.	Length Inches	Carton Quantity	Standard Package Quantity	List Price Each	Refilling List Price Each
4650	65	7 7/8	5	50	$1.50	$0.80
4651	70	7 7/8	5	50	1.50	.80
4652	75	7 7/8	5	50	1.50	.80
4653	80	7 7/8	5	50	1.50	.80
4654	85	7 7/8	5	50	1.50	.80
4655	90	7 7/8	5	50	1.50	.80
4656	95	7 7/8	5	50	1.50	.80
4657	100	7 7/8	5	50	1.50	.80
4658	110	9 5/8	5	25	2.50	1.20
4659	125	9 5/8	5	25	2.50	1.20
4660	150	9 5/8	5	25	2.50	1.20
4661	175	9 5/8	5	25	2.50	1.20
4662	200	9 5/8	5	25	2.50	1.20
4663	225	11 5/8	2	25	5.50	2.00
4664	250	11 5/8	2	25	5.50	2.00
4665	275	11 5/8	2	25	5.50	2.00
4666	300	11 5/8	2	25	5.50	2.00
4667	325	11 5/8	2	25	5.50	2.00
4668	350	11 5/8	2	25	5.50	2.00
4669	375	11 5/8	2	25	5.50	2.00
4670	400	11 5/8	2	25	5.50	2.00

600 Volts 450-1000 Amps.



Catalog Number	Amps.	Length Inches	Carton Quantity	Standard Package Quantity	List Price Each	Refilling List Price Each
4671	450	13 3/8	2	10	8.00	3.00
4672	500	13 3/8	2	10	8.00	3.00
4673	550	13 3/8	2	10	8.00	3.00
4674	600	13 3/8	2	10	8.00	3.00
*4675	650	14 1/2	1	10	15.00	5.00
*4676	700	14 1/2	1	10	15.00	5.00
*4677	750	14 1/2	1	10	15.00	5.00
*4678	800	14 1/2	1	10	15.00	5.00
*4679	850	15 5/8	1	10	18.00	6.00
*4680	900	15 5/8	1	10	18.00	6.00
*4681	950	15 5/8	1	10	18.00	6.00
*4682	1000	15 5/8	1	10	18.00	6.00

*Not approved by the Underwriters' Laboratories.

The "NOARK" Enclosed line also embraces a large assortment of Fuse Blocks with either porcelain or slate bases, front and back connection contacts, clips and lugs.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 113 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/113

Noark Renewable Fuses

NOARK RENEWABLE FUSES have been developed to meet a demand for a Cartridge Enclosed Fuse that can be quickly renewed.

These fuses are superior to similar devices on the market and are approved by the Underwriters' Laboratories, Inc.

Noark Renewable Fuses

National Electric Code Standard Dimensions

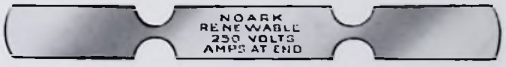
250 Volts 3-60 Amps.



Catalog Number	Amperes	Carton Quantity	Standard Package Quantity	Standard Package Weight Pounds	List Price Each
2802	3	10	100	5¼	$0.50
2803	4	10	100	5¼	.50
2804	5	10	100	5¼	.50
2805	6	10	100	5¼	.50
2806	7	10	100	5¼	.50
2807	8	10	100	5¼	.50
2808	9	10	100	5¼	.50
2809	10	10	100	5¼	.50
2810	12	10	100	5¼	.50
2811	15	10	100	5¼	.50
2812	20	10	100	5¼	.50
2813	25	10	100	5¼	.50
2814	30	10	100	5¼	.50
2815	35	10	100	13½	1.00
2816	40	10	100	13½	1.00
2817	45	10	100	13½	1.00
2818	50	10	100	13½	1.00
2819	55	10	100	13½	1.00
2820	60	10	100	13½	1.00

Noark Renewable Fuse Links

250 Volts 3-60 Amps.



Catalog Number	Amperes	Standard Package Quantity	Standard Package Weight Ounces	List Price Each
2902	3	100	3	$0.03
2903	4	100	3	.03
2904	5	100	3	.03
2905	6	100	3	.03
2906	7	100	3	.03
2907	8	100	3	.03
2908	9	100	3	.03
2909	10	100	3	.03
2910	12	100	3	.03
2911	15	100	3	.03
2912	20	100	3	.03
2913	25	100	3	.03
2914	30	100	3	.03
2915	35	100	10	.05
2916	40	100	10	.05
2917	45	100	10	.05
2918	50	100	10	.05
2919	55	100	10	.05
2920	60	100	10	.05

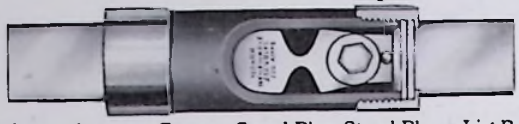
Different capacities cannot be combined to make Standard Package Quantities.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 114 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/114

Noark Renewable Fuses

National Electric Code Standard Dimensions

250 Volts 65-600 Amps.



Catalog Number	Amperes	Carton Quantity	Stand. Pkg. Quantity	Stand. Pkg. Wt. Lbs.	List Price Each
2850	65	5	50	18	$2.00
2851	70	5	50	18	2.00
2852	75	5	50	18	2.00
2853	80	5	50	18	2.00
2854	85	5	50	18	2.00
2855	90	5	50	18	2.00
2856	95	5	50	18	2.00
2857	100	5	50	18	2.00
2858	110	5	25	22	4.00
2859	125	5	25	22	4.00
2860	150	5	25	22	4.00
2861	175	5	25	22	4.00
2862	200	5	25	22	4.00
2863	225	2	25	48	7.50
2864	250	2	25	48	7.50
2865	275	2	25	48	7.50
2866	300	2	25	48	7.50
2867	325	2	25	48	7.50
2868	350	2	25	48	7.50
2869	375	2	25	48	7.50
2870	400	2	25	48	7.50
2871	450	2	10	30	11.00
2872	500	2	10	30	11.00
2873	550	2	10	30	11.00
2874	600	2	10	30	11.00

Noark Renewable Fuse Links

250 Volts 65-600 Amps.

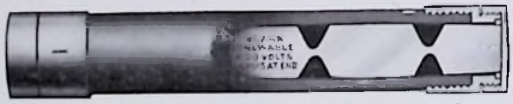


Catalog Number	Amperes	Standard Package Quantity	Standard Package Weight Ounces	List Price Each
2950	65	50	6	$0.10
2951	70	50	6	.10
2952	75	50	6	.10
2953	80	50	6	.10
2954	85	50	6	.10
2955	90	50	6	.10
2956	95	50	6	.10
2957	100	50	6	.10
2958	110	25	7	.15
2959	125	25	7	.15
2960	150	25	7	.15
2961	175	25	7	.15
2962	200	25	7	.15
2963	225	25	14	.30
2964	250	25	14	.30
2965	275	25	14	.30
2966	300	25	14	.30
2967	325	25	14	.30
2968	350	25	14	.30
2969	375	25	14	.30
2970	400	25	14	.30
2971	450	10	11	.60
2972	500	10	11	.60
2973	550	10	11	.60
2974	600	10	11	.60

Noark Renewable Fuses

National Electric Code Standard Dimensions

600 Volts 3-60 Amps.



Catalog Number	Amperes	Carton Quantity	Stand. Pkg. Quantity	Stand. Pkg. Wt. Lbs.	List Price Each
4802	3	10	100	16	$1.10
4803	4	10	100	16	1.10
4804	5	10	100	16	1.10
4805	6	10	100	16	1.10
4806	7	10	100	16	1.10
4807	8	10	100	16	1.10
4808	9	10	100	16	1.10
4809	10	10	100	16	1.10
4810	12	10	100	16	1.10
4811	15	10	100	16	1.10
4812	20	10	100	16	1.10
4813	25	10	100	16	1.10
4814	30	10	100	16	1.10
4815	35	10	100	30	1.25
4816	40	10	100	30	1.25
4817	45	10	100	30	1.25
4818	50	10	100	30	1.25
4819	55	10	100	30	1.25
4820	60	10	100	30	1.25

Noark Renewable Fuse Links

600 Volts 3-60 Amps.



Catalog Number	Amperes	Standard Package Quantity	Standard Package Weight Ounces	List Price Each
4902	3	100	9	$0.05
4903	4	100	9	.05
4904	5	100	9	.05
4905	6	100	9	.05
4906	7	100	9	.05
4907	8	100	9	.05
4908	9	100	9	.05
4909	10	100	9	.05
4910	12	100	9	.05
4911	15	100	9	.05
4912	20	100	9	.05
4913	25	100	9	.05
4914	30	100	9	.05
4915	35	100	18	.06
4916	40	100	18	.06
4917	45	100	18	.06
4918	50	100	18	.06
4919	55	100	18	.06
4920	60	100	18	.06

Different capacities cannot be combined to make Standard Package Quantities.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 115 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/115

Noark Renewable Fuses

National Electric Code Standard Dimensions

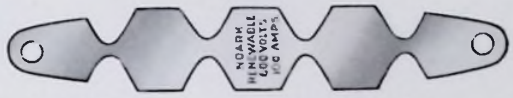
600 Volts 65-600 Amps.



Catalog Number	Amperes	Carton Quantity	Stand. Pkg. Quantity	Stand. Pkg. Wt. Lbs.	List Price Each
4850	65	5	50	31	$3.00
4851	70	5	50	31	3.00
4852	75	5	50	31	3.00
4853	80	5	50	31	3.00
4854	85	5	50	31	3.00
4855	90	5	50	31	3.00
4856	95	5	50	31	3.00
4857	100	5	50	31	3.00
4858	110	5	25	35	5.00
4859	125	5	25	35	5.00
4860	150	5	25	35	5.00
4861	175	5	25	35	5.00
4862	200	5	25	35	5.00
4863	225	2	25	75	11.00
4864	250	2	25	75	11.00
4865	275	2	25	75	11.00
4866	300	2	25	75	11.00
4867	325	2	25	75	11.00
4868	350	2	25	75	11.00
4869	375	2	25	75	11.00
4870	400	2	25	75	11.00
4871	450	2	10	48	16.00
4872	500	2	10	48	16.00
4873	550	2	10	48	16.00
4874	600	2	10	48	16.00

Noark Renewable Fuse Links

600 Volts 65-600 Amps.



Catalog Number	Amperes	Standard Package Quantity	Standard Package Weight Ounces	List Price Each
4950	65	50	10	$0.10
4951	70	50	10	.10
4952	75	50	10	.10
4953	80	50	10	.10
4954	85	50	10	.10
4955	90	50	10	.10
4956	95	50	10	.10
4957	100	50	10	.10
4958	110	25	12	.15
4959	125	25	12	.15
4960	150	25	12	.15
4961	175	25	12	.15
4962	200	25	12	.15
4963	225	25	24	.30
4964	250	25	24	.30
4965	275	25	24	.30
4966	300	25	24	.30
4967	325	25	24	.30
4968	350	25	24	.30
4969	375	25	24	.30
4970	400	25	24	.30
4971	450	10	20	.60
4972	500	10	20	.60
4973	550	10	20	.60
4974	600	10	20	.60

Different capacities cannot be combined to make Standard Package Quantities.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 116 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/116

Noark Main-Line and Branch Cutout Bases

For National Electric Code Standard Fuses

Foreword

THE Noark Cutout Bases listed herein are of a new and improved construction. In the 0-60 ampere capacities, they have contacts secured in recesses formed in the porcelains without the use of screws passing through from underneath. Consequently waxed counter-bores are entirely done away with, interposing between the live metal parts and the surfaces on which the cutout bases are mounted a solid insulating body. While securely positioned, the contacts are purposely loose, enabling them to make and maintain perfect contact with the ferrules of the fuses they are adapted to receive.

The larger capacity cutout bases have contacts—in the 61-200 ampere capacities—stamped from a single piece of metal and of an improved and more compact construction in the larger sizes.

Several new cutout bases have been added to make the line more complete.

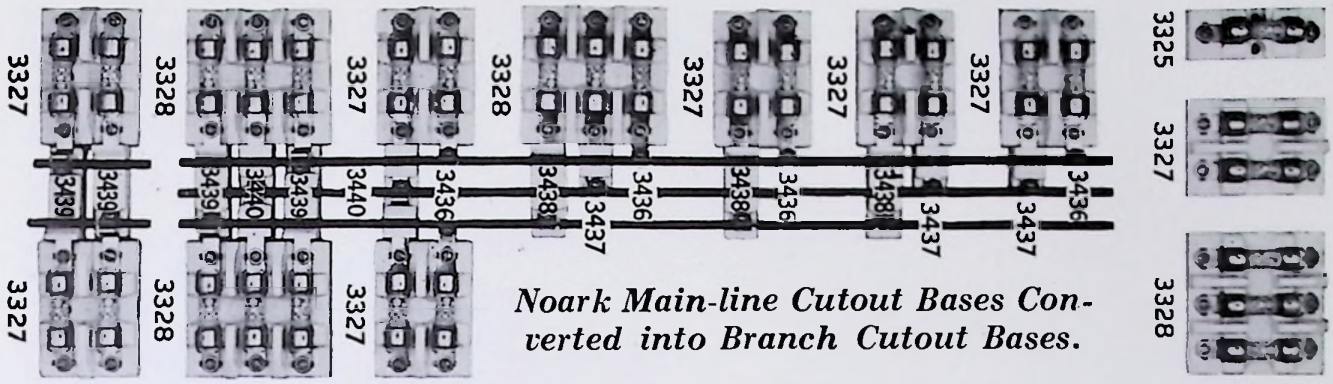
Noark main-line cutout bases can now be converted into branch cutout bases by means of Noark branch tap straps. The panels on pages 115 and 116 illustrate the seven combinations in each capacity. Two of them, in each capacity, namely, the second and third combinations shown, are new and have not been possible of accomplishment with any hitherto existing device.

The interchangeability of the new main-line cutout bases reduces stocks 35% and enables wiremen with small quantities of material to make any installation which the exigencies of the situation may require.

Noark Main-line and Branch Cutout Bases are protected by the following U. S. Patents: 1,025,245; 1,025,246; 1,092,430; 1,199,348; 1,227,753; 1,234,544. Other Patents Pending.

NOTE—Noark Branch Tap Straps are designed to be used interchangeably with all types of Plug Cutout Bases.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 117 of 154
asbestosclaims.law/library/21286/117



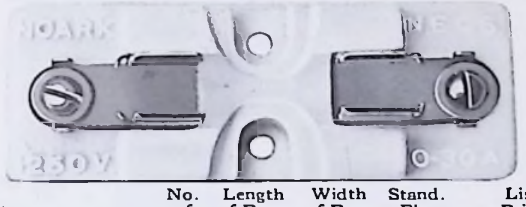
Noark Main-line Cutout Bases Converted into Branch Cutout Bases.

Noark N. E. C. S. Cutout Bases

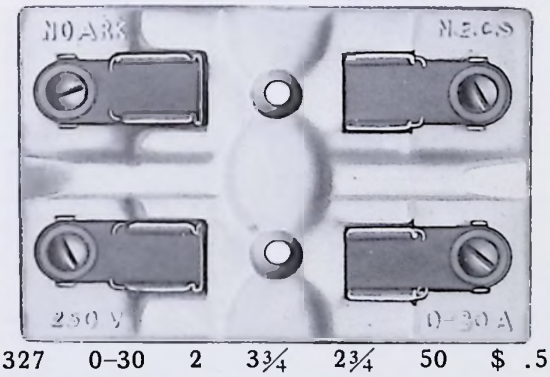
250 Volts 0-30 Amps. Main Line

(Interchangeably used for Branch Cutout Bases)

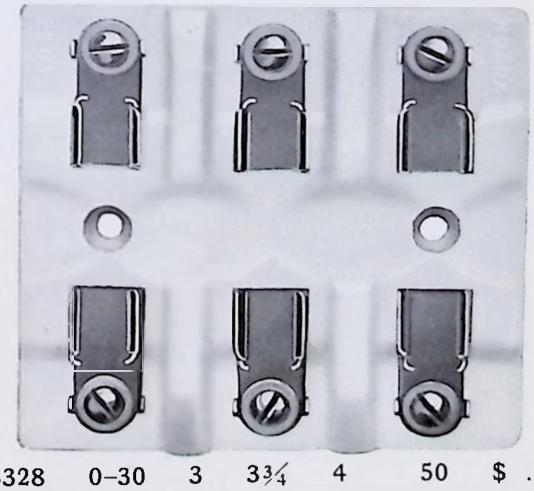
1, 2 and 3-pole



Cat. No.	Amperes	No. of Poles	Length of Base, Inches	Width of Base, Inches	Stand. Pkg. Quan.	List Price, Each
3325	0–30	1	3¾	1¼	50	$ .40



3327	0–30	2	3¾	2¾	50	$ .55



3328	0–30	3	3¾	4	50	$ .80

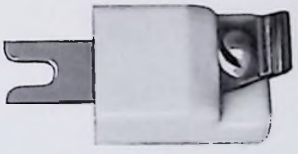
Noark Branch Tap Straps

for converting Main Line into Branch Cutout Bases

125-250 Volts 0-30 Amps.



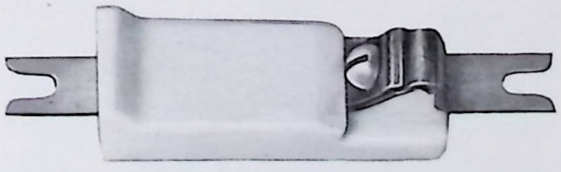
Cat. No.	Carton Quantity	Stand. Pkg. Quantity	List Price, Each
3436	10	100	$ .09



3437	10	100	$ .16



3438	10	100	$ .24

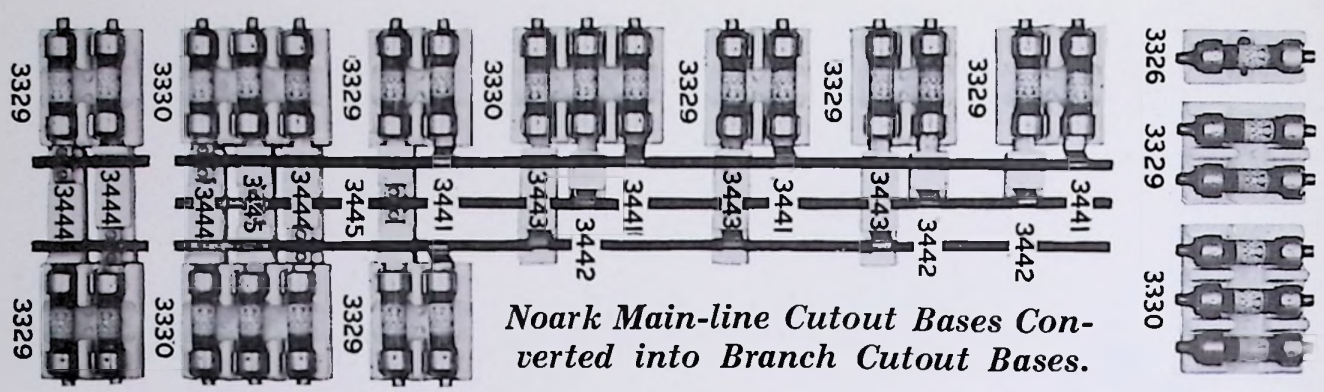


3439	10	100	$ .27



3440	10	100	$ .21

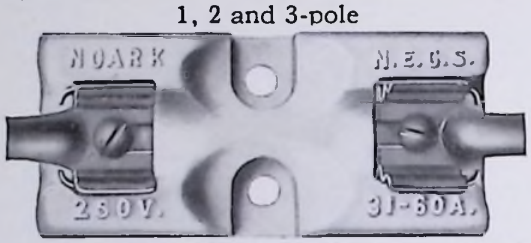
Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 118 of 154
asbestosclaims.law/library/21286/118



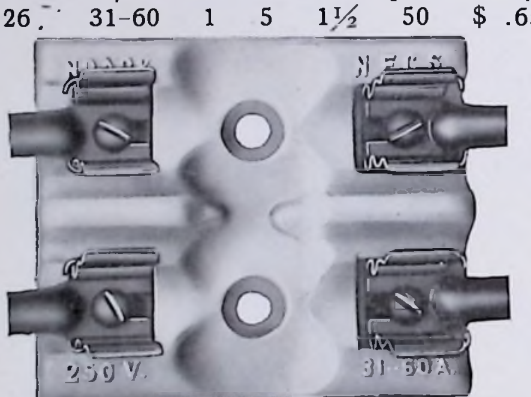
Noark Main-line Cutout Bases Converted into Branch Cutout Bases.

Noark N. E. C. S. Cutout Bases

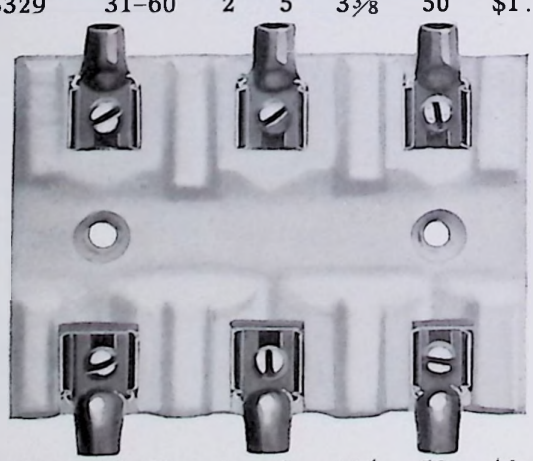
250 Volts 31-60 Amps. Main Line
(Interchangeably used for Branch Cutout Bases)
1, 2 and 3-pole



Cat. No.	Amperes	No. of Poles	Length of Base, Inches	Width of Base, Inches	Stand. Pkg. Quan.	List Price, Each, with Lugs
3326	31–60	1	5	1½	50	$ .65



3329	31–60	2	5	3⅜	50	$1.40



3330	31–60	3	5	4⅞	50	$2.00

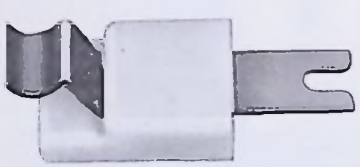
Noark Branch Tap Straps

for Converting Main Line into Branch Cutout Bases

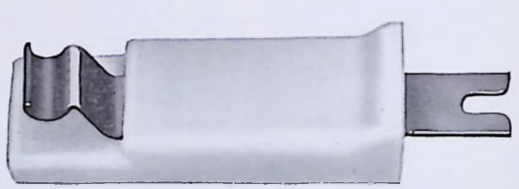
125-250 Volts 31-60 Amps.



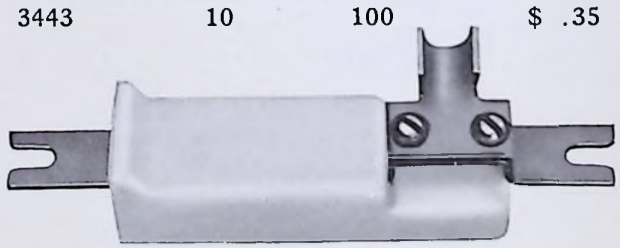
Cat. No.	Carton Quantity	Stand. Pkg. Quantity	List Price, Each
3441	10	100	$ .10



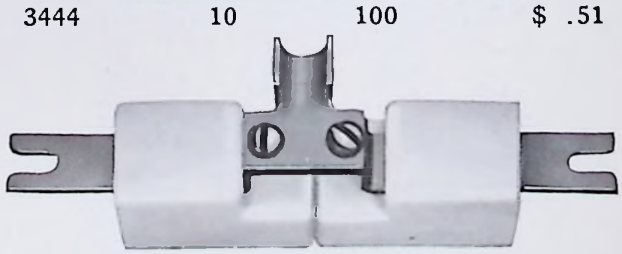
3442	10	100	$ .19



3443	10	100	$ .35



3444	10	100	$ .51



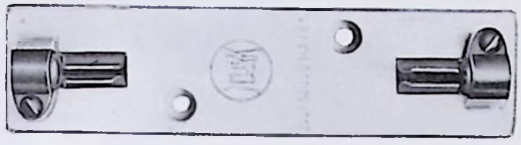
3445	10	100	$ .45

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 119 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/119

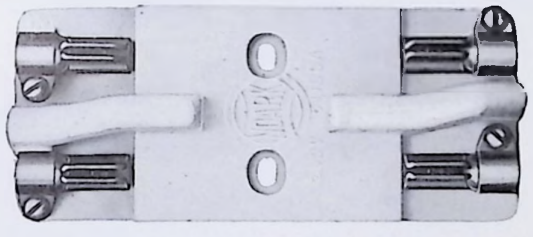
Noark N. E. C. S. Cutout Bases

250 Volts 61-100 Amps. Main Line

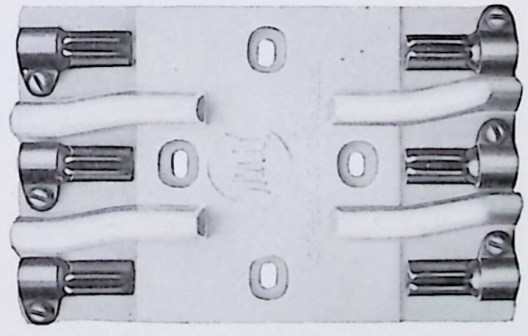
1, 2 and 3-pole



Cat. No.	Amperes	No. of Poles	Length of Base, Inches	Width of Base, Inches	Stand. Pkg. Quan.	List Price, Each, with Lugs
3335	61–100	1	7¾	2	50	$ .90



3331	61–100	2	7½	3⅞	50	$2.80

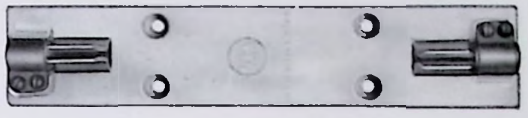


3332	61–100	3	7½	5⅝	25	$4.00

Noark N. E. C. S. Cutout Bases

250 Volts 101-1000 Amps. Main Line

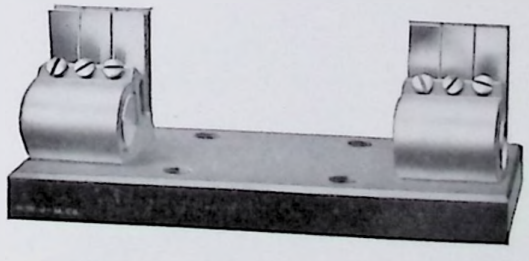
1-Pole



Cat. No.	Amperes	No. of Poles	Length of Base, Inches	Width of Base, Inches	Stand. Pkg. Quan.	List Price, Each, with Lugs
3336	101–200	1	9⅝	2¼	25	$2.10



3337	201–400	1	11¾	3	25	$5.25
3338	401–600	1	14	3½	10	7.20



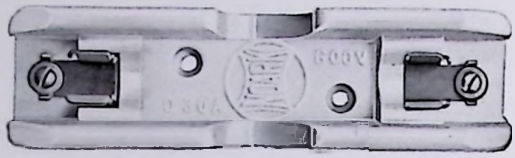
3339	601–800	1	12	5	10	$20.00
3340	801–1000	1	13 1/16	5¾	10	25.00

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 120 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/120

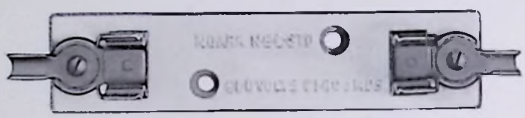
Noark N. E. C. S. Cutout Bases

600 Volts 0-60 Amps. Main Line

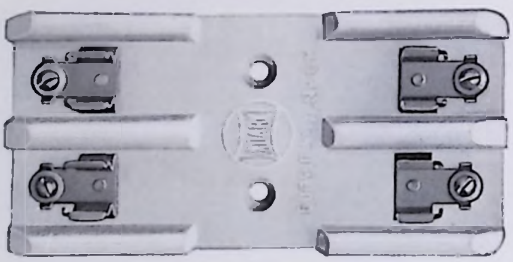
1, 2 and 3-pole



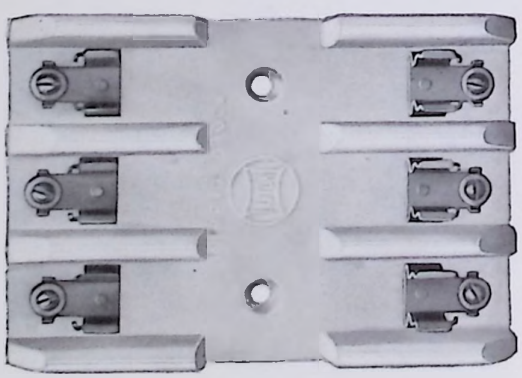
Cat. No.	Amperes	No. of Poles	Length of Base, Inches	Width of Base, Inches	Stand. Pkg. Quan.	List Price, Each, Lugs above 30 Amp.
5600	0–30	1	6 7/8	1 1/2	50	$ .60
5603	31–60	1	7 3/4	2 1/2	50	1.20



5602	0–30	1	6 7/8	1 1/2	50	$ .60
5601	31–60	1	7 1/2	1 3/4	50	.90



5604	0–30	2	6 7/8	3 5/16	50	$1.70
5606	31–60	2	7 1/2	3 13/16	50	2.40



5605	0–30	3	6 5/16	4 7/8	50	$2.85
5607	31–60	3	7 1/2	5 9/16	50	3.60

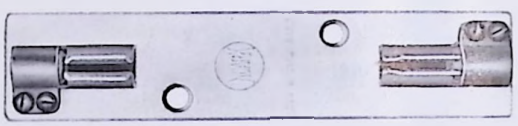
Noark N. E. C. S. Cutout Bases

600 Volts 61-1000 Amps. Main Line

1-pole



Cat. No.	Amperes	No. of Poles	Length of Base, Inches	Width of Base, Inches	Stand. Pkg. Quan.	List Price, Each, with Lugs
5608	61–100	1	9 13/16	2 7/16	50	$2.40
5609	101–200	1	12 3/16	3	25	4.80



5610	61–100	1	9 3/4	2	50	$1.32
5611	101–200	1	12 1/8	2 1/2	25	2.30



Slate Base

5612	201–400	1	14 7/8	3 5/8	25	$6.00
5613	401–600	1	17	4	10	7.80



5614	601–800	1	15	5 1/4	10	$21.00
5615	801–1000	1	16 1/16	6	10	26.00

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 121 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/121

Johns-Manville Friction Tapes



JOHNS-MANVILLE Friction Tapes are made of strong, closely woven fabric, heavily impregnated with a specially treated compound. They have remarkable adhesive properties and long life. Are not affected by heat, cold or moisture. Do not dry out with age. Contain nothing to corrode wires. Are free from pin-holes, lumps and thin spots. Have exceptional insulating efficiency, due to the heavy and even saturation. They contain the maximum yardage per pound.

Johns-Manville Friction Tapes are three-fourths of an inch wide and are put up in standard 8-ounce rolls, wrapped in tin-foil and packed in strong Manila paper cartons.

Jomanco, gray in color, is the highest grade of friction tape on the market, and is recommended for permanent underground, subway, mines, railway signal, sign, wireless telegraph systems and general out-door work, where the highest class of insulated joint is required. It is preferred by manufacturers of high-grade electrical machinery because of its ability to withstand high voltages. Used for all purposes under the most exacting conditions, it has never been known to fail.

Johns-Manville No. 3 Tape.—A popular material for taping motor leads, switchboards and inside wiring where a good insulation is required. Strong in friction, possesses high heat-retarding qualities and dielectric strength.

Johns-Manville No. 5 Friction Tape.—A good grade for standard electrical work and other miscellaneous and domestic uses, free from surface defects. Shows little or no deterioration for a year, if stored under proper conditions.

Johns-Manville Armature Tape.—Made from thin, closely woven sheeting of highest quality, frictioned on one side only. Suitable for winding armatures, field coils, etc.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 122 of 154
asbestosclaims.law/library/21286/122

Johns-Manville Rubber Splicing Compounds

JOHNS-MANVILLE Rubber Splicing Compounds.— Johns-Manville Rubber Splicing Compounds when applied, form a homogeneous mass without the aid of heat, making a watertight joint that lasts indefinitely. They are made of Para Rubber scientifically compounded so that they do not dry out. They are uniform in thickness throughout—no lumps or thin spots—and have exceptional strength. Johns-Manville Rubber Splicing Compounds are ¾" wide and are put up in 8-oz. rolls, wrapped in tin-foil and packed in strong Manila paper cartons.

Johns-Manville Alpha Rubber Splicing Compound.—This is our highest-grade splicing compound. Absolutely perfect joints, that are impervious to moisture and stronger dielectrically and mechanically than the insulation of the wire itself, can be made with this compound. Will withstand a test of 300 volts per mil.

Johns-Manville Brooklyn Rubber Splicing Compound.—A good splicing compound recommended for low voltage work.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 123 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/123

Johns-Manville Refractory Cements



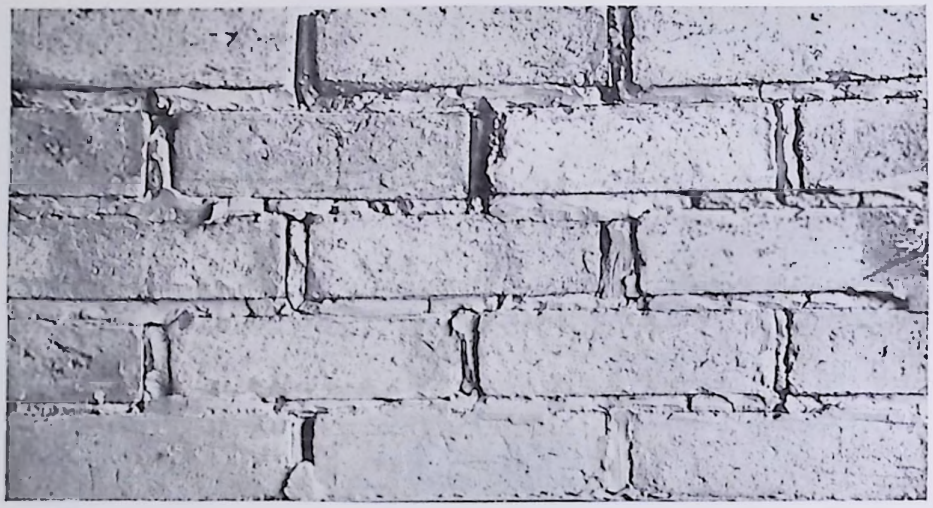
Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 124 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/124

Johns-Manville Refractory or High-Temperature Cements

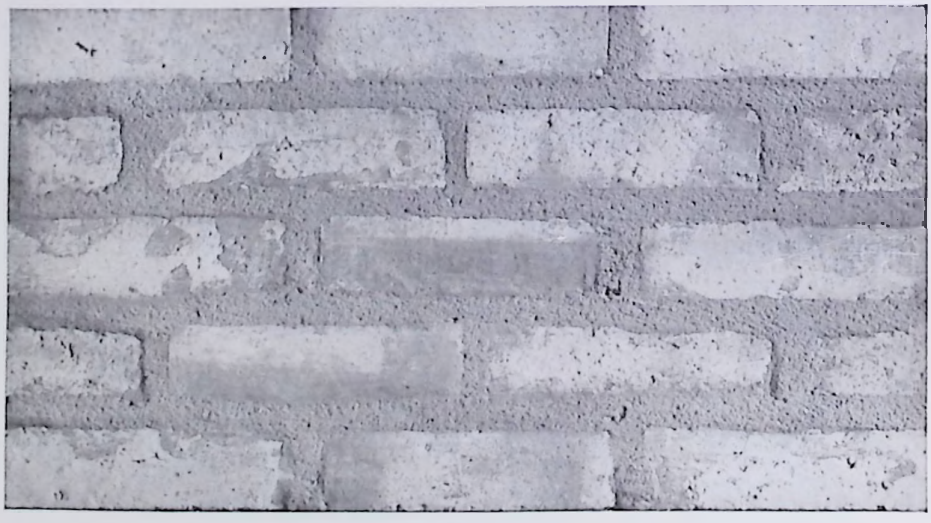
MODERN engineering, power plant and boiler room practice is responsible for higher temperatures in the boiler fire box, and greater wear and tear on boiler settings, bridge walls and baffles.

Oil burners, mechanical stokers and mechanical draft all contribute to increase power plant efficiency but result in more severe boiler conditions.

The MAXIMUM efficiency that can be expected by modernizing boiler equipment can be most nearly approached by building settings that are tight and do not allow air to leak through, bridge walls that resist the action of flame and gases and baffle walls that do not allow the hot gases to leak through or short circuit.



This figure shows a portion of a boiler wall set up with fire-clay which has disintegrated, cracked and fallen away, leaving the edges and faces of the brick exposed to the flames.



This figure shows how when Johns-Manville No. 26 or 31 Refractory Cement is used for setting up the brick, the edges of the brick are protected against the action of the flames.

The life of a fire box or furnace brick setting does not depend *entirely* upon the quality or type of brick used. If only one face or surface of a brick is exposed to flame or heat the temperature may be increased to a point far beyond what the brick would stand if the entire brick were surrounded by heat or if even small portions of the other five surfaces were exposed. The reason is that when only one face or surface is exposed, the brick conducts the heat from that surface and there is a uniform drop in temperature from surfaces exposed to the surfaces directly opposite. If more than one surface is exposed to heat, especially a part of the four adjacent faces, that part of the brick which is surrounded becomes hotter than the balance of the brick and this difference in temperature causes internal stress which results in spawling.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 125 of 154
asbestosclaims.law/library/21286/125

An example of one and four adjacent surfaces of brick being exposed to heat is a fire-brick setting in which the fire-clay or bond between the brick has given way, either on account of the bond's inability to resist heat and having melted out, or on account of its inability to resist expansion and contraction and having crumbled and fallen out. This falling away of the bond allows heat to come in contact with parts of the four brick surfaces adjacent to the face that forms the inside of the furnace setting.

The thickness of the bond between fire bricks is often reduced, sometimes to practically nothing, but this method throws all stress due to expansion and contraction upon the brick itself and generally causes the brick to crack.

It is obvious that the ideal refractory bond for setting up fire bricks would be one that resists high temperatures and expansion and contraction without melting or disintegrating, and which possesses the quality of resiliency which would allow the fire brick to expand and contract without damage to the brick or bond.

The use of Johns-Manville Refractory Cements, which are composed of highly refractory materials, is not limited to the setting up of brick work. When baffle walls, dampers and other molded pieces which are to be subjected to high temperatures are built with these cements, additional boiler efficiency is obtained on account of the practical elimination of heat leakage. Moreover, the life of the molded pieces and dampers is greatly increased. The use of our refractory cements for these purposes is explained on the following pages.

Johns-Manville Refractory Cements No. 26, No. 31, and No. 32 and Johns-Manville Retort Cement No. 40 possess the desired qualities referred to above and are designed to take care of a variety of conditions where refractory cements are required to resist temperatures from 0 to 3100° F.

Johns-Manville Refractory Cement No. 31 is recommended for setting up fire bricks of boilers and furnaces. It begins to vitrify or gain strength at about 1500° F. and will resist temperatures up to 3100° F.

Johns-Manville Refractory Cement No. 26 is recommended where temperatures do not exceed 2600° F. and where they are above 900°. It is suitable for molding into slabs or pieces that are to be subjected to temperatures not exceeding 2600° F., such as dampers in incinerator or garbage burners, lining of doors, baffle walls, etc.

Johns-Manville Refractory Cement No. 32 is made and recommended for coating the face of fire bricks exposed to heat and will resist temperatures up to 3100° F. This coating prevents clinkers and slag working their way into the fire brick and the subsequent breaking down of the brick when such clinkers are removed.

Johns-Manville Retort Cement No. 40 may be used as a refractory in connection with temperatures up to 2000° F. This cement is furnished in plastic form and sets hard when air dried. It is admirably adapted for the lining of doors and for patching or filling cracks between boiler door frames and boiler setting and for general use around gas works and chemical plants wherever a cement is required that must resist acid fumes as well as heat. On account of its combined refractory and acid fume resisting qualities it is recommended for use in setting up brick smoke stacks.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 126 of 154
asbestosclaims.law/library/21286/126

Johns-Manville Special Refractory Cements

We manufacture and are prepared to furnish special refractory cements for conditions that our standard cements are not adapted to, such as temperatures exceeding 3100° F., conditions where chemical reaction, molten metal or gases prevent the use of our standard refractories, and in general conditions that require a careful study of service for which the refractory is to be used before a definite recommendation can be made. Engineers are available at all Johns-Manville Branches.

Directions for applying Johns-Manville Refractory Cements will be found on this and the following pages.

Johns-Manville Refractory Cements Are Packed as Follows:

Nos. 31, 26 and 32 in 100 lb. bags and 400 lb. barrels.

Retort Cement No. 40 in 1, 5, 10, 25, 50, 100, 200, 300, 400, 600 and 800 lb. containers. Weight of containers above 100 lbs. are approximate.

Directions for Applying Johns-Manville Refractory Cements

No. 31

(For temperatures ranging from 1,500 deg. to 3,100 deg. F.)

No. 31 Refractory Cement is recommended for use as a mortar or bond between brick in fire-brick settings.

When setting brick—Mix water with cement to get proper mortar (see note below *) consistency. **Mixture must be kept thoroughly mixed** and free from lumps, and as little water as possible should be used. Mix thoroughly rather than add excessive water to make mixing easy.

"Butter" or trowel the cement on the brick **already placed,** then lay brick on top and tap until joint between brick is about ⅛" thick and cement squeezes out between edges.

Do not "point up" or cut off cement that squeezes out between edges, but plaster or trowel it back over the face of the joint and brick, so that it protects the edges of the brick. Make a "T" joint.

Amount of water required for mixing can best be found by trial, but there is always more danger of using too much rather than too little water. The thicker the mortar is, the better, as long as it can be easily handled.

*Always Thoroughly Mix Until Free from Lumps

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 127 of 154
asbestosclaims.law/library/21286/127

No. 26

(For temperatures ranging from 900 deg. to 2,600 deg. F.)

No. 26 Refractory Cement is recommended for use as a mortar or bond between brick in fire-brick settings, also for building slabs, dampers, doors or door linings, oven or incinerator covers, etc. No. 26 Cement is recommended for building Johns-Manville Monolithic Baffle Walls.

When setting brick—Mix water with cement to get proper mortar consistency. **Mixture must be kept thoroughly mixed and free from lumps.** Use as little water as possible.

"Butter" or trowel the cement on the brick **already placed,** then lay brick on top and tap until joint between brick is about 1/8" thick and cement squeezes out between edges.

Do not "point up" or cut off cement that squeezes out between edges, but plaster or trowel it back over the face of the joint and brick, so that it protects the edges of the brick. Make a "T" joint.

When No. 26 cement is to be used for molding dampers, slabs, door linings, etc., mix sufficient water until mixture has a consistency of dry molding sand and is **absolutely and thoroughly mixed and free from lumps.**

Tamp cement in mold, or in place, solidly—the harder and denser it is packed, the better—then dry **gradually** with a slow fire till all water has evaporated. After all water has been slowly driven out, the slab or molded piece may be subjected to higher temperatures, which will vitrify it.

Large molded pieces should be reinforced by surrounding the edges with an iron band or frame and by running iron bolts or rods through the slab. All such rods should be covered or wrapped with asbestos paper to a thickness of about 1/16". This allows for expansion and contraction of the iron.

Amount of water required for mixing can best be found by trial. There is always more danger of using too much rather than too little water. The thicker the mortar is, the better, as long as it can be easily handled.

Always Thoroughly Mix Until Free from Lumps

No. 32

(Where temperatures range from 1,200 deg. to 3,100 deg. F.)

No. 32 Refractory Cement is recommended for coating the face of the brick work exposed to flame and high temperatures, thus forming a protective, heat-resisting surface. It is also recommended when it is desired to "dip" clay saggers or setting fire-brick up closely, instead of using mortar joints.

No. 32 Refractory Cement is **not** intended to be used as a mortar for making thick joints. Use No. 31 or No. 26 for this purpose.

To prepare No. 32 Cement for use, mix sufficient water with the cement to get proper consistency. The mixture must be kept thoroughly mixed and free from lumps.

If cement is to be applied to the surface of the fire-brick settings or walls, apply it with a stiff brush or broom.

If saggers or brick are to be dipped, dip each brick or sagger separately.

When setting up brick which have been dipped, rub the brick, when placed, to a tight joint.

Amount of water required for mixing can best be determined by trial, as the porosity of the brick or sagger to be coated or dipped largely determines the proper consistency. A porous brick requires a thinner mixture than one not so porous.

Use a mixture that gives a coating about 1/32" thick.

Always Thoroughly Mix Until Free from Lumps

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 128 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/128

Technical Data Covering Various Johns-Manville Refractory Cements

	No. 26	No. 31	No. 32	Retort No. 40
Lowest working temperature or low point of vitrifaction	900°F	1450°	1256°	Atmospheric
Highest working temperature	2600°F	3100°	3100°	2000°
Melting-point	2700°F	3182°	3146°	2250°
Complete fusion	2750°F	3254°	3200°	2250°
Specific gravity	1.68	1.76	1.77	1.84
Weight in lbs. per cu. ft., molded	105	110	.....	.....
Weight in lbs. per cu. ft., powdered	77	99	80.1	.....
*Approximate number lbs. required for setting 1,000 brick	500	500	.....	400
*Approximate number lbs. required per hundred sq. ft. to coat the surface of fire-brick settings 1/16-inch thick	.....	.....	60	.....
*Approximate number lbs. required per hundred sq. ft. to coat the surface of fire-brick settings 3/32-inch thick	.....	.....	90	.....

*Quantity of Cement required varies a great deal, depending upon the porosity of the brick. Above quantities are based on average conditions, and may have to be increased.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 129 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/129

The Construction of Johns-Manville Monolithic Baffle Walls

THE Johns-Manville Monolithic Baffle Wall is constructed by first eliminating the present wall, in case of an old boiler, and then placing wooden forms or walls four inches apart, where the baffle is desired.

These forms can be set vertical or inclined with the top towards the front or back of the boiler as desired.

Johns-Manville Branches are in a position to place, supervise the placing of, or give complete instructions as to how to cut and place the forms referred to.

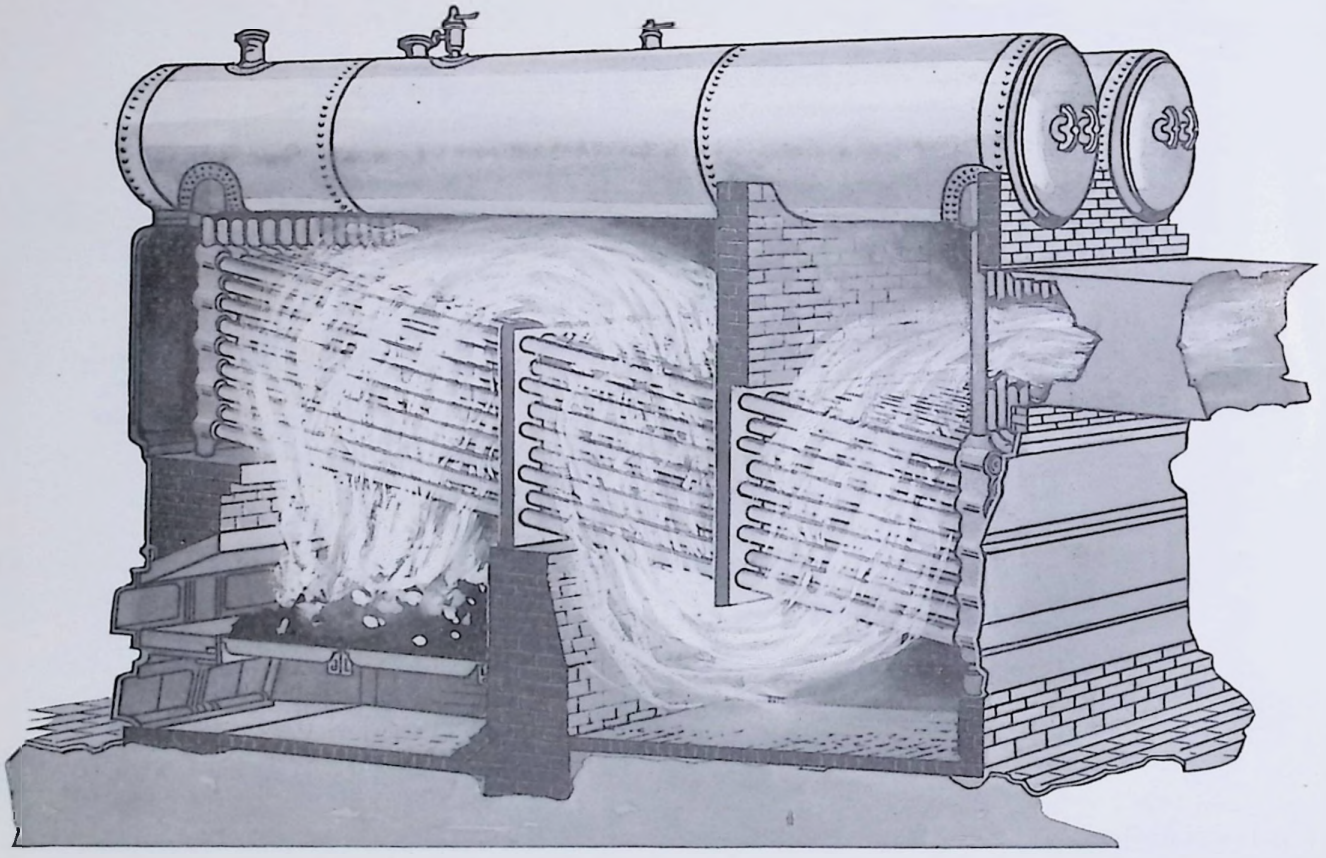
Johns-Manville Refractory Cement, mixed to proper consistency, is then poured and tamped between the forms.

After the refractory mixture has completely dried and a fire has been started in the boiler, the wooden forms will burn out, leaving a solid monolithic refractory baffle wall, which eliminates leakage of hot gases.

Johns-Manville Baffle Walls will be installed or the installation supervised by any Johns-Manville Branch.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 130 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/130

Johns-Manville Monolithic Baffle Walls



THE effectiveness of Johns-Manville Monolithic Baffle Walls is very convincingly illustrated in this picture, showing as it does, a solid wall or slab molded to fit closely around the tubes, with absolutely no joints or cracks. The leakage of heat-laden gases through such a wall is impossible, particularly as it is built of a material that will resist high temperatures incidental to this severe service.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 131 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/131

A Few Prominent Users of Johns-Manville Refractory Cements

Canadian

Bathurst Lumber Co., Bathurst, N. B.
Grand Trunk Railway, Montreal, Que.
Hospital for Sick Children, Toronto, Ont.
Hamilton Gear Co., Toronto, Ont.
Consumers Gas Co., Toronto, Ont.
City of Toronto, Toronto, Ont.
Saskatoon Power House, Saskatoon, Sask.

New England States

New London Ship & Engine Co., Groton, Conn.
Eastern Connecticut Power Co., Montville, Conn.
Bigelow Hartford Carpet Co., Thompsonville, Conn.
St. John Lumber Co., Van Buren, Me.
Pejepscot Paper Co., Brunswick, Me.
Central Maine Power Co., Waterville, Me.
Stanley Works, Bridgewater, Mass.
New England Westinghouse Co., Springfield, Mass.
Lowell Electric Light Corp., Lowell, Mass.
Fisk Rubber Co., Springfield, Mass.
Loose-Wiles Biscuit Co., Boston, Mass.
City of Boston, Various Departments, Boston, Mass.
Boston Consolidated Gas Co., Boston, Mass.
Boston & Albany R. R., Boston, Mass.
Worcester Gas Light Co., Worcester, Mass.
Stanley Motor Carriage Co., Newton, Mass.
American Woolen Co., Boston, Mass.
Rockingham County Light & Power Co., Portsmouth, N. H.
W. H. McElwain Co., Manchester, N. H.
Fitzdale Paper Co., Fitzdale, Vt.
Crompton Co., Crompton, R. I.
Jenckes Spinning Co., Pawtucket, R. I.
Warren Mfg. Co., Warren, R. I.
Herreshoff Mfg. Co., Bristol, R. I.

Middle Atlantic States

Edge Moor Iron Co., Edge Moor, Del.
E. I. Du Pont de Nemours & Co., Wilmington, Del.
Footers Dye Works, Cumberland, Md.
Babcock & Wilcox Co., Bayonne, N. J.
Worthington Pump Co., Harrison, N. J.
Public Service Co., Jersey City, N. J.
Sherwin Williams Co., Newark, N. J.
Eberhard Faber Co., Brooklyn, N. Y.
International Cork Co., Brooklyn, N. Y.
Transit Dev. Co., Brooklyn, N. Y.
American Agricultural Chemical Co., New York City, N. Y.
Federal Sugar Refining Co., New York City, N. Y.
Barrett Mfg. Co., New York City, N. Y.
Singer Mfg. Co., New York City, N. Y.
Standard Paint Co., New York City, N. Y.
Standard Oil Co., New York City, N. Y.
General Electric Co., Schenectady, N. Y.
Steinway & Sons, Steinway, L. I.
Sement-Solvay Co., Solvay, N. Y.
New Process Gear Corp., Syracuse, N. Y.
Pennsylvania Railroad Co., Philadelphia, Penn.
Bethlehem Steel Co., Philadelphia, Penn.
Midvale Steel Co., Philadelphia, Penn.
Crucible Steel Co., Pittsburgh, Penn.
American Reduction Co., Pittsburgh, Penn.
Sheldon Axle Co., Wilkes-Barre, Penn.

Southern States

Chandler Building, Atlanta, Ga.
Southern Power Co., Charlotte, N. C.
Union Seed & Fertilizer Co., Jackson, Miss.
Sumter Lighting Co., Sumter, S. C.

Central States

Crane Co., Chicago, Ill.
Int. Harvester Co., Chicago, Ill.
American Can Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
American Bridge Co., Chicago, Ill.
Link-Belt Co., Chicago, Ill.
Calumet Steel Co., Chicago Heights, Ill.
Deere & Co., Moline, Ill.
Indianapolis Abattoir Co., Indianapolis, Ind.
Inter State Public Service Co., Indianapolis, Ind.
Postum Cereal Co., Battle Creek, Mich.
Kellogg Toasted Corn Flakes Co., Battle Creek, Mich.
Parke, Davis Co., Detroit, Mich.
Continental Motors Co., Detroit, Mich.
Wickes Boiler Co., Saginaw, Mich.
Cleveland Elec. Co., Cleveland, O.
Cleveland Worsted Mills Co., Cleveland, O.
Nashville Rwy. & Lt. Co., Nashville, Tenn.
Allis-Chalmers Co., Milwaukee, Wis.
City of Milwaukee, Milwaukee, Wis.
Pabst Brewing Co., Milwaukee, Wis.

Southwestern States

United Verde Ext. Mining Co., Warren, Ariz.
Union Seed & Fertilizer Co., Helena, Ark.
Brown Shoe Co., St. Louis, Mo.
Missouri Pacific R. R. Co., St. Louis, Mo.
Chino Copper Mining Co., Hurley, N. M.
Armour & Co., Ft. Worth, Tex.
Houston Lt. & Pr. Co., Houston, Tex.

Northwestern States

Northern Iowa Gas & Elec. Co., Humboldt, Ia.
State University of Iowa, Iowa City, Ia.
American Smelting & Refining Co., Omaha, Neb.
City of Omaha, Omaha, Neb.
Union Co., Omaha, Neb.

Pacific States

Alaskan Engineering Com., Anchorage, Alaska
Los Angeles Gas & Elec. Co., Los Angeles, Cal.
Associated Oil Co., San Francisco, Cal.
Great Northern Pac. S. S. Co., San Francisco, Cal.
Sierra-San Francisco Power Co., San Francisco, Cal.
Union Meat Co., Portland, Ore.
Northwest Steel Works, Portland, Ore.
Seattle Cedar Lumber Co., Seattle, Wash.
Spokane Heat, Light & Power Co., Spokane, Wash.
Todd Shipyards, Tacoma, Wash.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 132 of 154
asbestosclaims.law/library/21286/132

Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/133

Appendix

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 134 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/134

How to Use Tables of Pipe Insulation Efficiency and Loss from Bare Pipes and other Bare Surfaces

THE efficiency of pipe insulations varies according to the size of the pipe insulated and according to the temperature difference between steam in the pipe and air surrounding the pipe.

The relative values of different insulations may be determined by comparing either their efficiencies or the heat loss through the various types of insulation.

The efficiencies furnish a means of comparing the savings effected by insulations, with bare pipe losses. These latter are very large; therefore, *a seemingly small difference in efficiency may represent a really large difference in heat losses.*

The heat losses may be compared directly as follows:

Bare surface loss	=100%
Efficiency	=Percent saving

100%—% Efficiency=Loss through insulation expressed as a percentage of bare surface loss.

For example, an insulation which is 90% efficient allows a loss of only 10% of the loss from bare surface.

EXAMPLE: The efficiency of 2″ thick Asbesto-Sponge Felted Sheet Insulation at 500° temperature difference is 95.44% and the efficiency of the same insulation 3″ thick is 96.85%. The difference in efficiencies is only 1.41% which seems extremely small and might lead one to believe that it would not pay to use the extra inch of thickness.

However, the loss through the 95.44% efficient insulation is 4.56% of the loss from bare surface and the loss through the 96.85% efficient insulation is 3.15% of the loss from bare surface. The difference 4.56%—3.15%=1.41%. Therefore, the loss through the 2″ thickness is (1.41÷3.15=) 45% greater than the loss through the insulation 3″ in thickness.

The table on page 133 gives the total heat loss at various temperature differences on bare pipe of different sizes, and on flat surfaces. Tables of efficiency of the different insulations on various sized pipes and on flat surfaces at various temperature differences are given following the pages describing the insulations.

Use these tables as follows:

Example

What is the efficiency of Johns-Manville Asbesto-Sponge Felted Pipe Insulation 2 inches thick to be applied on a 6-inch pipe conveying steam at 200 pounds gauge pressure through a room where temperature is 70° F.

1. Determine difference between temperature of steam in pipe and air surrounding pipe (see Steam Tables, pages 133 to 136).

Temperature of steam 200 lb. pressure	=388° F.
Temperature of air around pipe	= 70° F.
Difference.....	318° F.

2. Refer to Table of Efficiencies for 2″ thick Asbesto-Sponge Felted Pipe Insulation.

Opposite pipe size (6″), you find

Efficiency for 350° F. difference	=92.6%
and for 300° F. difference	=91.9%
(subtract)	= .7%

If difference for 50°= .7% then for 1° difference is .7÷50=.014%

The difference you have (318°) is 18° more than 300, so 18 x .014=.252%, which added to 91.9% (efficiency for 300°) =92.15% the required efficiency.

If you desire to find exactly how much heat is saved by applying this 2″ insulation, proceed as follows:

1. Refer to table giving total heat loss in B.t.u. per lineal foot of bare pipe (page 133).

Opposite pipe size (6″) and under 300° difference you find loss is 1694.9 B.t.u. per hour and under 350° difference loss is 2198.7 B.t.u. The difference in loss for the 50° difference=2198.7—1694.9=503.8 B.t.u. and for 1° difference it is 503.8÷50=10.07 B.t.u.

The difference you have (318°) is 18° more than 300, so 18 x 10.07=181.3 B.t.u., which added to 1694.9=1876.2 B.t.u., the required total heat loss from 1 lineal foot of the 6″ bare pipe per hour.

Having obtained the loss for bare pipe the saving effected by the 2″ Asbesto-Sponge Felted Insulation is obtained by multiplying the total loss 1876.2 B.t.u. by the efficiency of the insulation formerly found (92.15%) or 92.15 x 1876.2=1729 B.t.u. saved per lineal foot per hour.

This result may be compared with the quantities of heat saved by other types or thicknesses of pipe insulations which quantities may be obtained in similar manner to the above.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 135 of 154
asbestosclaims.law/library/21286/135

Appendix of Miscellaneous Insulation Data

Total Heat Loss in B. t. u. Per Hour Per Lineal Foot of Bare Pipe of Different Sizes and Per Square Foot of Flat Surfaces and at Various Temperature Differences

(For finding losses at temperatures between those shown, the B. t. u. Differences per Degree are given in small type between the Main Columns)

Pipe Size	Area of Pipe Surface per lin. ft.	Temperature Differences 50°		100°		150°		200°		250°		300°		350°		400°		450°		500°
		Heat Loss in B. t. u. per lineal ft. per Hour																		
½"	.220	21.5	*.52	47.3	*.64	79.2	*.76	117.3	*.90	162.3	*1.06	215.2	*1.28	279.1	*1.52	355.1	*1.93	451.4	*2.37	569.8
¾"	.274	26.8	.64	59.0	.79	98.6	.96	146.8	1.11	202.1	1.33	268.5	1.58	347.6	1.89	442.2	2.40	562.2	2.95	709.7
1"	.344	33.6	.81	74.0	1.00	123.8	1.19	183.4	1.41	253.7	1.67	337.4	1.98	436.5	2.37	555.2	3.03	705.4	3.69	891.
1¼"	.435	42.5	1.01	93.6	1.26	156.6	1.51	231.9	1.78	320.8	2.09	425.4	2.53	551.9	3.00	702.1	3.80	892.6	4.68	1126.7
1½"	.498	48.7	1.17	107.2	1.44	179.3	1.72	265.4	2.04	367.3	2.39	487.	2.90	631.8	3.44	803.8	4.36	1021.9	5.36	1289.8
2"	.622	60.9	1.46	133.9	1.80	223.9	2.15	331.5	2.54	458.7	2.99	608.3	3.62	789.2	4.29	1003.9	5.45	1276.3	6.09	1611.
2½"	.753	73.4	1.76	161.6	2.18	270.4	2.60	400.3	3.07	553.9	3.61	734.5	4.37	952.8	5.19	1212.1	6.58	1541.1	8.08	1945.1
3"	.917	89.6	2.15	197.3	2.66	330.1	3.17	488.8	3.75	676.3	4.41	896.8	5.33	1163.4	6.33	1480.	8.03	1881.7	9.87	2375.
3½"	1.047	102.3	2.46	225.3	3.03	376.9	3.62	558.1	4.28	772.2	5.04	1024.	6.09	1328.4	7.23	1689.9	9.17	2148.4	11.3	2711.7
4"	1.178	115.1	2.77	253.5	3.41	424.2	4.07	627.9	4.82	868.8	5.67	1152.1	6.85	1494.6	8.13	1901.3	10.3	2417.3	12.7	3051.
4½"	1.309	127.9	3.07	281.5	3.79	470.9	4.53	697.2	5.35	964.7	6.29	1279.2	7.61	1659.5	9.03	2111.1	11.05	2684.	14.1	3387.7
5"	1.456	142.2	3.42	313.1	4.21	523.8	5.03	775.5	5.95	1073.	7.00	1423.	8.46	1846.	10.0	2348.4	12.7	2985.7	15.7	3768.5
6"	1.734	169.4	4.05	371.9	5.04	623.9	6.00	923.7	7.09	1278.1	8.34	1694.9	10.1	2198.7	12.0	2797.1	15.2	3556.2	18.6	4488.5
7"	2.00	195.0	4.71	430.4	5.79	720.0	6.92	1066.0	8.19	1475.6	9.61	1956.	11.66	2539.	13.78	3228.	17.46	4101.	21.6	5180.
8"	2.257	220.6	5.30	485.7	6.54	812.5	7.81	1203.	9.23	1664.5	10.8	2207.3	13.1	2863.6	15.6	3642.8	19.8	4631.4	24.3	5845.6
9"	2.52	246.0	5.92	542.	7.30	907.	8.72	1343.	10.34	1860.	12.1	2465.	14.7	3200.	17.4	4070.	22.0	5170.	27.2	6530.
10"	2.817	275.4	6.62	606.2	8.16	1014.1	9.75	1501.5	11.5	2077.5	13.6	2755.	16.4	3574.1	19.5	4546.6	24.7	5780.5	30.3	7296.
11"	3.08	300.	7.26	663.	8.92	1109.	10.66	1642.	12.6	2272.	14.76	3010.	17.9	3905.	21.3	4972.	26.9	6315.	33.3	7980.
12"	3.34	326.	7.86	719.	9.68	1203.	11.54	1780.	13.7	2465.	16.02	3266.	19.4	4235.	23.1	5390.	29.2	6850.	36.0	8650.
14"o. d.	3.66	357.	8.59	786.	10.61	1318.	12.64	1950.	15.0	2700.	17.06	3580.	21.3	4645.	25.2	5905.	31.0	7500.	39.5	9475.
16"o. d.	4.19	408.	9.83	901.	12.2	1510.	14.5	2233.	17.2	3095.	20.1	4100.	24.4	5320.	28.9	6765.	36.5	8590.	45.2	10850.
Flat, Curved, or Cylindrical Surfaces.		Heat Loss in B. t. u. per sq. ft. per Hour																		
		97.5	2.35	215.2	2.90	360.0	3.46	533.0	4.10	737.8	4.80	978.0	5.83	1269.4	6.89	1614.0	8.73	2050.6	10.8	2590.0
		Heat Loss in B. t. u. per sq. ft. per degree temperature difference per Hour																		
		1.950		2.152		2.400		2.665		2.951		3.260		3.627		4.035		4.557		5.180

*Example 2" Pipe, 235° Temp. Difference. 235°−200°=35°; 35° x 2.54 (B. t. u. per degree)=88.9 B. t. u. 331.5+88.9=420.4; B. t. u. loss at 235° Temp. difference.

Steam Table

Reprinted from Marks & Davis' Steam Tables and Diagrams, by permission of the publishers, Longmans, Green & Co.

Gauge Press. lbs.	Absol. Press. lbs. p	Temp. Deg. F. t	Press. Atmos* —	Sp. Vol. cu. ft. per lb. v or s	Density lbs. per cu. ft 1/v	Heat of the liquid h or q	Latent heat of evap. L or r	Total heat of steam H	Internal Energy B.t.u. Evap. l or ρ	Internal Energy B.t.u. Steam E	Entropy Water n or θ	Entropy Evap. L/T or r/T	Entropy Steam N or φ	Gauge Press lbs.
.....	1	101.83	0.068	333.0	0.00300	69.8	1034.6	1104.4	972.9	1042.7	0.1327	1.8427	1.9754	.....
.....	2	126.15	0.136	173.5	0.00576	94.0	1021.0	1115.0	956.7	1050.7	0.1749	1.7431	1.9180	.....
.....	3	141.52	0.204	118.5	0.00845	109.4	1012.3	1121.6	946.4	1055.8	0.2008	1.6840	1.8848	.....
.....	4	153.01	0.272	90.5	0.01107	120.9	1005.7	1126.5	938.6	1059.5	0.2198	1.6416	1.8614	.....
.....	5	162.28	0.340	73.33	0.01364	130.1	1000.3	1130.5	932.4	1062.5	0.2348	1.6084	1.8432	.....
.....	6	170.06	0.408	61.89	0.01616	137.9	995.8	1133.7	927.0	1064.9	0.2471	1.5814	1.8285	.....
.....	7	176.85	0.476	53.56	0.01867	144.7	991.8	1136.5	922.4	1067.1	0.2579	1.5582	1.8161	.....
.....	8	182.86	0.544	47.27	0.02115	150.8	988.2	1139.0	918.2	1069.0	0.2673	1.5380	1.8053	.....
.....	9	188.27	0.612	42.36	0.02361	156.2	985.0	1141.1	914.4	1070.5	0.2756	1.5202	1.7958	.....
.....	10	193.22	0.680	38.38	0.02606	161.1	982.0	1143.1	910.9	1072.0	0.2832	1.5042	1.7874	.....
.....	11	197.75	0.748	35.10	0.02849	165.7	979.2	1144.9	907.8	1073.4	0.2902	1.4895	1.7797	.....
.....	12	201.96	0.816	32.36	0.03090	169.9	976.6	1146.5	904.8	1074.7	0.2967	1.4760	1.7727	.....
.....	13	205.87	0.885	30.03	0.03330	173.8	974.2	1148.0	902.0	1075.8	0.3025	1.4639	1.7664	.....
.....	14	209.55	0.953	28.02	0.03569	177.5	971.9	1149.4	899.3	1076.8	0.3081	1.4523	1.7604	.....
.0	14.7	212.00	1.000	26.79	0.03732	180.0	970.4	1150.4	897.6	1077.5	0.3118	1.4447	1.7565	.0
.3	15	213.0	1.021	26.27	0.03806	181.0	969.7	1150.7	896.8	1077.8	0.3133	1.4416	1.7549	.3
1.3	16	216.3	1.089	24.79	0.04042	184.4	967.6	1152.0	894.4	1078.7	0.3183	1.4311	1.7494	1.3
2.3	17	219.4	1.157	23.38	0.04277	187.5	965.6	1153.1	892.1	1079.6	0.3229	1.4215	1.7444	2.3
3.3	18	222.4	1.225	22.16	0.04512	190.5	963.7	1154.2	889.9	1080.4	0.3273	1.4127	1.7400	3.3
4.3	19	225.2	1.293	21.07	0.04746	193.4	961.8	1155.2	887.8	1081.1	0.3315	1.4045	1.7360	4.3
5.3	20	228.0	1.361	20.08	0.04980	196.1	960.0	1156.2	885.8	1081.9	0.3355	1.3965	1.7320	5.3
6.3	21	230.6	1.429	19.18	0.05213	198.8	958.3	1157.1	883.9	1082.6	0.3393	1.3887	1.7280	6.3
7.3	22	233.1	1.497	18.37	0.05445	201.3	956.7	1158.0	882.0	1083.2	0.3430	1.3811	1.7241	7.3
8.3	23	235.5	1.565	17.62	0.05676	203.8	955.1	1158.8	880.2	1083.9	0.3465	1.3739	1.7204	8.3
9.3	24	237.8	1.633	16.93	0.05907	206.1	953.5	1159.6	878.5	1084.5	0.3499	1.3670	1.7169	9.3

* 1 atmo (standard atmosphere) =760 mms. of Hg. by def. =29.921 ins. of Hg. =14.696 lbs. per sq. in.

$T° = t° + 459.6$; $J = 777.5$ ft. lbs. per B.t.u. [log = 2.89 071]; $A = 1/J = 1.286 \times 10^{-3}$; 144 A = 0.1852 [log = 1.26 764].

NOTE.—The gauge pressures are put in only for your guidance in making quick estimates of conditions. Wherever very accurate computations are to be made, find out the atmospheric pressure at your altitude and add this to the gauge pressure and use the resulting *absolute pressure* in the table.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 136 of 154
asbestosclaims.law/library/21286/136

Gauge Press. lbs.	Absol. Press. lbs. p	Temp. Deg. F. t	Press. Atmos* —	Sp. Vol. cu. ft. per lb. v or s	Density lbs. per cu. ft 1/v	Heat of the liquid h or q	Latent heat of evap. L or r	Total heat of steam H	Internal Energy B.t.u. Evap. l or ρ	Internal Energy B.t.u. Steam E	Entropy Water n or θ	Entropy Evap. L/T or r/T	Entropy Steam N or φ	Gauge Press lbs.
10.3	25	240.1	1.701	16.30	0.0614	208.4	952.0	1160.4	876.8	1085.1	0.3532	1.3604	1.7136	10.3
11.3	26	242.2	1.769	15.72	0.0636	210.6	950.6	1161.2	875.1	1085.6	0.3564	1.3542	1.7106	11.3
12.3	27	244.4	1.837	15.18	0.0659	212.7	949.2	1161.9	873.5	1086.2	0.3594	1.3483	1.7077	12 3
13.3	28	246.4	1.905	14.67	0.0682	214.8	947.8	1162.6	872.0	1086.7	0.3623	1.3425	1.7048	13.3
14.3	29	248.4	1.973	14.19	0.0705	216.8	946.4	1163.2	870.5	1087.2	0.3652	1.3367	1.7019	14.3
15.3	30	250.3	2.041	13.74	0.0728	218.8	945.1	1163.9	869.0	1087.7	0.3680	1.3311	1.6991	15.3
16.3	31	252.2	2.109	13.32	0.0751	220.7	943.8	1164.5	867.6	1088.2	0.3707	1.3257	1.6964	16.3
17.3	32	254.1	2.178	12.93	0.0773	222.6	942.5	1165.1	866.2	1088.6	0.3733	1.3205	1.6938	17.3
18.3	33	255.8	2.246	12.57	0.0795	224.4	941.3	1165.7	864.8	1089.1	0.3759	1.3155	1.6914	18.3
19.3	34	257.6	2.314	12.22	0.0818	226.2	940.1	1166.3	863.4	1089.5	0.3784	1.3107	1.6891	19.3
20.3	35	259.3	2.382	11.89	0.0841	227.9	938.9	1166.8	862.1	1089.9	0.3808	1.3060	1.6868	20.3
21.3	36	261.0	2.450	11.58	0.0863	229.6	937.7	1167.3	860.8	1090.3	0.3832	1.3014	1.6846	21.3
22.3	37	262.6	2.518	11.29	0.0886	231.3	936.6	1167.8	859.5	1090.7	0.3855	1.2969	1.6824	22.3
23.3	38	264.2	2.586	11.01	0.0908	232.9	935.5	1168.4	858.3	1091.0	0.3877	1.2925	1.6802	23.3
24.3	39	265.8	2.654	10.74	0.0931	234.5	934.4	1168.9	857.1	1091.4	0.3899	1.2882	1.6781	24.3
25.3	40	267.3	2.722	10.49	0.0953	236.1	933.3	1169.4	855.9	1091.8	0.3920	1.2841	1.6761	25.3
26.3	41	268.7	2.790	10.25	0.0976	237.6	932.2	1169.8	854.7	1092.2	0.3941	1.2800	1.6741	26.3
27.3	42	270.2	2.858	10.02	0.0998	239.1	931.2	1170.3	853.6	1092.5	0.3962	1.2759	1.6721	27.3
28.3	43	271.7	2.926	9.80	0.1020	240.5	930.2	1170.7	852.4	1092.8	0.3982	1.2720	1.6702	28.3
29.3	44	273.1	2.994	9.59	0.1043	242.0	929.2	1171.2	851.3	1093.2	0.4002	1.2681	1.6683	29.3
30.3	45	274.5	3.062	9.39	0.1065	243.4	928.2	1171.6	850.3	1093.5	0.4021	1.2644	1.6665	30.3
31.3	46	275.8	3.130	9.20	0.1087	244.8	927.2	1172.0	849.2	1093.8	0.4040	1.2607	1.6647	31.3
32.3	47	277.2	3.198	9.02	0.1109	246.1	926.3	1172.4	848.1	1094.1	0.4059	1.2571	1.6630	32.3
33.3	48	278.5	3.266	8.84	0.1131	247.5	925.3	1172.8	847.1	1094.4	0.4077	1.2536	1.6613	33.3
34.3	49	279.8	3.334	8.67	0.1153	248.8	924.4	1173.2	846.1	1094.7	0.4095	1.2502	1.6597	34.3
35.3	50	281.0	3.402	8.51	0.1175	250.1	923.5	1173.6	845.0	1095.0	0.4113	1.2468	1.6581	35.3
36.3	51	282.3	3.470	8.35	0.1197	251.4	922.6	1174.0	844.0	1095.3	0.4130	1.2435	1.6565	36.3
37.3	52	283.5	3.538	8.20	0.1219	252.6	921.7	1174.3	843.1	1095.5	0.4147	1.2402	1.6549	37.3
38.3	53	284.7	3.606	8.05	0.1241	253.9	920.8	1174.7	842.1	1095.8	0.4164	1.2370	1.6534	38.3
39.3	54	285.9	3.674	7.91	0.1263	255.1	919.9	1175.0	841.1	1096.1	0.4180	1.2339	1.6519	39.3
40.3	55	287.1	3.742	7.78	0.1285	256.3	919.0	1175.4	840.2	1096.3	0.4196	1.2309	1.6505	40.3
41.3	56	288.2	3.810	7.65	0.1307	257.5	918.2	1175.7	839.3	1096.6	0.4212	1.2278	1.6490	41.3
42.3	57	289.4	3.878	7.52	0.1329	258.7	917.4	1176.0	838.3	1096.8	0.4227	1.2248	1.6475	42.3
43.3	58	290.5	3.947	7.40	0.1350	259.8	916.5	1176.4	837.4	1097.1	0.4242	1.2218	1.6460	43.3
44.3	59	291.6	4.015	7.28	0.1372	261.0	915.7	1176.7	836.5	1097.3	0.4257	1.2189	1.6446	44.3
45.3	60	292.7	4.083	7.17	0.1394	262.1	914.9	1177.0	835.6	1097.6	0.4272	1.2160	1.6432	45.3
46.3	61	293.8	4.151	7.06	0.1416	263.2	914.1	1177.3	834.8	1097.8	0.4287	1.2132	1.6419	46.3
47.3	62	294.9	4.219	6.95	0.1438	264.3	913.3	1177.6	833.9	1098.0	0.4302	1.2104	1.6406	47.3
48.3	63	295.9	4.287	6.85	0.1460	265.4	912.5	1177.9	833.1	1098.2	0.4316	1.2077	1.6393	48.3
49.3	64	297.0	4.355	6.75	0.1482	266.4	911.8	1178.2	832.2	1098.4	0.4330	1.2050	1.6380	49.3
50.3	65	298.0	4.423	6.65	0.1503	267.5	911.0	1178.5	831.4	1098.7	0.4344	1.2024	1.6368	50.3
51.3	66	299.0	4.491	6.56	0.1525	268.5	910.2	1178.8	830.5	1098.9	0.4358	1.1998	1.6345	51.3
52.3	67	300.0	4.559	6.47	0.1547	269.6	909.5	1179.0	829.7	1099.1	0.4371	1.1972	1.6333	52.3
53.3	68	301.0	4.627	6.38	0.1569	270.6	908.7	1179.3	828.9	1099.3	0.4385	1.1946	1.6311	53.3
54.3	69	302.0	4.695	6.29	0.1590	271.6	908.0	1179.6	828.1	1099.5	0.4398	1.1921	1.6319	54.3
55.3	70	302.9	4.763	6.20	0.1612	272.6	907.2	1179.8	827.3	1099.7	0.4411	1.1896	1.6307	55.3
56.3	71	303.9	4.831	6.12	0.1634	273.6	906.5	1180.1	826.5	1099.9	0.4424	1.1872	1.6296	56.3
57.3	72	304.8	4.899	6.04	0.1656	274.5	905.8	1180.4	825.8	1100.1	0.4437	1.1848	1.6285	57.3
58.3	73	305.8	4.967	5.96	0.1678	275.5	905.1	1180.6	825.0	1100.3	0.4449	1.1825	1.6274	58.3
59.3	74	306.7	5.035	5.89	0.1699	276.5	904.4	1180.9	824.2	1100.5	0.4462	1.1801	1.6263	59.3
60.3	75	307.6	5.103	5.81	0.1721	277.4	903.7	1181.1	823.5	1100.6	0.4474	1.1778	1.6252	60.3
61.3	76	308.5	5.171	5.74	0.1743	278.3	903.0	1181.4	822.7	1100.8	0.4487	1.1755	1.6242	61.3
62.3	77	309.4	5.239	5.67	0.1764	279.3	902.3	1181.6	822.0	1101.0	0.4499	1.1732	1.6231	62.3
63.3	78	310.3	5.307	5.60	0.1786	280.2	901.7	1181.8	821.3	1101.2	0.4511	1.1710	1.6221	63.3
64.3	79	311.2	5.375	5.54	0.1808	281.1	901.0	1182.1	820.6	1101.4	0.4523	1.1687	1.6210	64.3
65.3	80	312.0	5.444	5.47	0.1829	282.0	900.3	1182.3	819.8	1101.6	0.4535	1.1665	1.6200	65.3
66.3	81	312.9	5.512	5.41	0.1851	282.9	899.7	1182.5	819.1	1101.7	0.4546	1.1644	1.6190	66.3
67.3	82	313.8	5.580	5.34	0.1873	283.8	899.0	1182.8	818.4	1101.9	0.4557	1.1623	1.6180	67.3
68.3	83	314.6	5.648	5.28	0.1894	284.6	898.4	1183.0	817.7	1102.1	0.4568	1.1602	1.6170	68.3
69.3	84	315.4	5.716	5.22	0.1915	285.5	897.7	1183.2	817.0	1102.2	0.4579	1.1581	1.6160	69.3
70.3	85	316.3	5.784	5.16	0.1937	286.3	897.1	1183.4	816.3	1102.4	0.4590	1.1561	1.6151	70.3
71.3	86	317.1	5.852	5.10	0.1959	287.2	896.4	1183.6	815.6	1102.6	0.4601	1.1540	1.6141	71.3
72.3	87	317.9	5.920	5.05	0.1980	288.0	895.8	1183.8	815.0	1102.7	0.4612	1.1520	1.6132	72.3
73.3	88	318.7	5.988	5.00	0.2001	288.9	895.2	1184.0	814.3	1102.9	0.4623	1.1500	1.6123	73.3
74.3	89	319.5	6.056	4.94	0.2023	289.7	894.6	1184.2	813.6	1103.0	0.4633	1.1481	1.6114	74.3
75.3	90	320.3	6.124	4.89	0.2044	290.5	893.9	1184.4	813.0	1103.2	0.4644	1.1461	1.6105	75.3
76.3	91	321.1	6.192	4.84	0.2065	291.3	893.3	1184.6	812.3	1103.3	0.4654	1.1442	1.6096	76.3
77.3	92	321.8	6.260	4.79	0.2087	292.1	892.7	1184.8	811.7	1103.5	0.4664	1.1423	1.6087	77.3
78.3	93	322.6	6.328	4.74	0.2109	292.9	892.1	1185.0	811.0	1103.6	0.4674	1.1404	1.6078	78.3
79.3	94	323.4	6.396	4.69	0.2130	293.7	891.5	1185.2	810.4	1103.8	0.4684	1.1385	1.6069	79.3
80.3	95	324.1	6.464	4.65	0.2151	294.5	890.9	1185.4	809.7	1103.9	0.4694	1.1367	1.6061	80.3
81.3	96	324.9	6.532	4.60	0.2172	295.3	890.3	1185.6	809.1	1104.1	0.4704	1.1348	1.6052	81.3
82.3	97	325.6	6.600	4.56	0.2193	296.1	889.7	1185.8	808.5	1104.2	0.4714	1.1330	1.6044	82.3
83.3	98	326.4	6.668	4.51	0.2215	296.8	889.2	1186.0	807.9	1104.4	0.4724	1.1312	1.6036	83.3
84.3	99	327.1	6.736	4.47	0.2237	297.6	886.6	1186.2	807.2	1104.5	0.4733	1.1295	1.6028	84.3

* 1 atmo (standard atmosphere) = 760 mms. of Hg. by def. = 29.921 ins. of Hg. = 14.696 lbs. per sq. in.
$T° = t° + 459.6$; J = 777.5 ft. lbs. per B.t.u. [log = 2.89 071]; $A = 1/J = 1.286 \times 10^{-3}$; 144 A = 0.1852 [log = 1.26 664].

NOTE.—The gauge pressures are put in only for your guidance in making quick estimates of conditions. Wherever very accurate computations are to be made, find out the atmospheric pressure at your altitude and add this to the gauge pressure and use the resulting *absolute pressure* in the table.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 137 of 154
asbestosclaims.law/library/21286/137

Gauge Press. lbs.	Absol. Press. lbs. p	Temp. Deg. F. t	Press. Atmos* —	Sp. Vol. cu. ft. per lb. v or s	Density lbs. per cu. ft 1/v	Heat of the liquid h or q	Latent heat of evap. L or r	Total heat of steam H	Internal Energy B.t.u. Evap. l or ρ	Internal Energy B.t.u. Steam E	Entropy Water n or θ	Entropy Evap. L/T or r/T	Entropy Steam N or φ	Gauge Press lbs.
85.3	100	327.8	6.80	4.429	0.2258	298.3	888.0	1186.3	806.6	1104.6	0.4743	1.1277	1.6020	85.3
86.3	101	328.6	6.87	4.388	0.2279	299.1	887.4	1186.5	806.0	1104.8	0.4752	1.1260	1.6012	86.3
87.3	102	329.3	6.94	4.347	0.2300	299.8	886.9	1186.7	805.4	1104.9	0.4762	1.1242	1.6004	87.3
88.3	103	330.0	7.01	4.307	0.2322	300.6	886.3	1186.9	804.8	1105.0	0.4771	1.1225	1.5996	88.3
89.3	104	330.7	7.08	4.268	0.2343	301.3	885.8	1187.0	804.2	1105.1	0.4780	1.1208	1.5988	89.3
90.3	105	331.4	7.14	4.230	0.2365	302.0	885.2	1187.2	803.6	1105.3	0.4789	1.1191	1.5980	90.3
91.3	106	332.0	7.21	4.192	0.2386	302.7	884.7	1187.4	803.0	1105.4	0.4798	1.1174	1.5972	91.3
92.3	107	332.7	7.28	4.155	0.2408	303.4	884.1	1187.5	802.5	1105.5	0.4807	1.1158	1.5965	92.3
93.3	108	333.4	7.35	4.118	0.2429	304.1	883.6	1187.7	801.9	1105.7	0.4816	1.1141	1.5957	93.3
94.3	109	334.1	7.42	4.082	0.2450	304.8	883.0	1187.9	801.3	1105.8	0.4825	1.1125	1.5950	94.3
95.3	110	334.8	7.49	4.047	0.2472	305.5	882.5	1188.0	800.7	1105.9	0.4834	1.1108	1.5942	95.3
96.3	111	335.4	7.55	4.012	0.2493	306.2	881.9	1188.2	800.2	1106.0	0.4843	1.1092	1.5935	96.3
97.3	112	336.1	7.62	3.978	0.2514	306.9	881.4	1188.4	799.6	1106.2	0.4852	1.1076	1.5928	97.3
98.3	113	336.8	7.69	3.945	0.2535	307.6	880.9	1188.5	799.0	1106.3	0.4860	1.1061	1.5921	98.3
99.3	114	337.4	7.76	3.912	0.2556	308.3	880.4	1188.7	798.5	1106.4	0.4869	1.1045	1.5914	99.3
100.3	115	338.1	7.83	3.880	0.2577	309.0	879.8	1188.8	797.9	1106.5	0.4877	1.1030	1.5907	100.3
102.3	117	339.4	7.96	3.817	0.2620	310.3	878.8	1189.1	796.8	1106.8	0.4894	1.0999	1.5893	102.3
104.3	119	340.6	8.10	3.756	0.2662	311.6	877.8	1189.4	795.7	1107.0	0.4911	1.0969	1.580	104.3
106.3	121	341.9	8.23	3.697	0.2705	313.0	876.7	1189.7	794.7	1110.2	0.4927	1.0938	1.5866	160.3
108.3	123	343.2	8.37	3.639	0.7480	314.3	875.7	1190.0	793.6	1107.4	0.4943	1.0910	1.5853	108.3
110.3	125	344.4	8.50	3.583	0.2791	315.5	874.7	1190.3	792.6	1107.7	0.4959	1.0880	1.5839	110.3
112.3	127	345.6	8.64	3.530	0.2833	316.8	873.8	1190.5	791.5	1107.9	0.4974	1.0851	1.5825	112.3
114.3	129	346.8	8.78	3.478	0.2875	318.0	872.8	1190.8	790.5	1108.1	0.4990	1.0823	1.5813	114.3
116.3	131	348.0	8.91	3.427	0.2918	319.3	871.8	1191.1	789.5	1108.3	0.5005	1.0796	1.5801	116.3
118.3	133	349.1	9.05	3.378	0.2960	320.5	870.9	1191.3	788.5	1108.5	0.5020	1.0769	1.5789	118.3
120.3	135	350.3	9.19	3.331	0.3002	321.7	869.9	1191.6	787.5	1108.7	0.5035	1.0742	1.5777	120.3
122.3	137	351.4	9.32	3.285	0.3044	322.8	869.0	1191.8	786.5	1108.9	0.5050	1.0715	1.5765	122.3
124.3	139	352.5	9.46	3.241	0.3086	324.0	868.1	1192.1	785.5	1109.1	0.5064	1.0689	1.5753	124.3
126.3	141	353.6	9.59	3.197	0.3129	325.2	867.2	1192.3	784.6	1109.3	0.5079	1.0662	1.5741	126.3
128.3	143	354.7	9.73	3.154	0.3171	326.3	866.3	1192.6	783.6	1109.5	0.5093	1.0637	1.5730	128.3
130.3	145	355.8	9.87	3.112	0.3213	327.4	865.4	1192.8	782.7	1109.6	0.5107	1.0612	1.5719	130.3
132.3	147	356.9	10.00	3.072	0.3255	328.6	864.5	1193.0	781.7	1109.8	0.5121	1.0587	1.5708	132.3
134.3	149	357.9	10.14	3.033	0.3297	329.7	863.6	1193.3	780.8	1110.0	0.5135	1.0562	1.5697	134.3
136.3	151	359.0	10.28	2.993	0.3341	330.8	862.7	1193.5	779.9	1110.2	0.5148	1.0538	1.5686	136.3
138.3	153	360.0	10.41	2.956	0.3383	331.9	861.8	1193.7	779.0	1110.4	0.5162	1.0513	1.5675	138.3
140.3	155	361.0	10.55	2.920	0.3425	332.9	861.0	1194.0	778.1	1110.5	0.5175	1.0489	1.5664	140.3
142.3	157	362.1	10.68	2.885	0.3467	334.0	860.1	1194.2	777.2	1110.7	0.5188	1.0466	1.5654	142.3
144.3	159	363.1	10.82	2.861	0.3508	335.1	859.3	1194.4	776.3	1110.8	0.5201	1.0443	1.5644	144.3
146.3	161	364.1	10.96	2.818	0.3549	336.2	858.4	1194.6	775.4	1111.0	0.5214	1.0420	1.5634	146.3
148.3	163	365.1	11.09	2.785	0.3591	337.2	857.6	1194.8	774.5	1111.2	0.5226	1.0398	1.5624	148.3
150.3	165	366.0	11.23	2.753	0.3633	338.2	856.8	1195.0	773.6	1111.3	0.5239	1.0376	1.5615	150.3
152.3	167	367.0	11.36	2.721	0.3675	339.2	855.9	1195.2	772.8	1111.4	0.5251	1.0354	1.5605	152.3
154.3	169	368.0	11.50	2.690	0.3717	340.2	855.1	1195.4	771.9	1111.6	0.5263	1.0332	1.5595	154.3
156.3	171	368.9	11.64	2.660	0.3759	341.2	854.3	1195.5	771.1	1111.7	0.5275	1.0311	1.5586	156.3
158.3	173	369.9	11.77	2.631	0.3801	342.2	853.5	1195.7	770.2	1111.9	0.5287	1.0289	1.5576	158.3
160.3	175	370.8	11.91	2.602	0.3843	343.2	852.7	1195.9	769.4	1112.0	0.5299	1.0268	1.5567	160.3
162.3	177	371.7	12.04	2.574	0.3885	344.2	851.9	1196.1	768.6	1112.2	0.5311	1.0246	1.5557	162.3
164.3	179	372.7	12.18	2.547	0.3927	345.2	851.2	1196.3	767.8	1112.4	0.5322	1.0225	1.5547	164.3
166.3	181	373.6	12.32	2.520	0.3969	346.1	850.4	1196.5	767.0	1112.5	0.5334	1.0205	1.5539	166.3
168.3	183	374.5	12.45	2.494	0.4010	347.1	849.6	1196.7	766.2	1112.6	0.5345	1.0185	1.5530	168.3
170.3	185	375.4	12.59	2.468	0.4052	348.0	848.8	1196.8	765.4	1112.8	0.5356	1.0164	1.5520	170.3
172.3	187	376.3	12.72	2.443	0.4094	349.0	848.0	1197.0	764.6	1112.9	0.5367	1.0144	1.5511	172.3
174.3	189	377.2	12.86	2.418	0.4136	349.9	847.3	1197.2	763.8	1113.0	0.5378	1.0124	1.5502	174.3
176.3	191	378.0	13.00	2.393	0.4178	350.8	846.5	1197.3	763.0	1113.2	0.5389	1.0105	1.5494	176.3
178.3	193	378.9	13.13	2.369	0.4220	351.7	845.8	1197.5	762.2	1113.3	0.5400	1.0085	1.5485	178.3
180.3	195	379.8	13.27	2.346	0.4262	352.7	845.0	1197.7	761.4	1113.4	0.5410	1.0066	1.5476	180.3
182.3	197	380.6	13.40	2.323	0.4304	353.6	844.3	1197.8	760.7	1113.6	0.5421	1.0047	1.5468	182.3
184.3	199	381.4	13.54	2.301	0.4346	354.4	843.6	1198.0	759.9	1113.7	0.5431	1.0029	1.5460	184.3
186.3	201	382.3	13.68	2.279	0.439	355.3	842.8	1198.2	759.2	1113.8	0.5442	1.0010	1.5452	186.3
188.3	203	383.1	13.81	2.258	0.443	356.2	842.1	1198.3	758.4	1113.9	0.5452	0.9992	1.5444	188.3
190.3	205	384.0	13.95	2.237	0.447	357.1	841.4	1198.5	757.6	1114.0	0.5463	0.9973	1.5436	190.3
192.3	207	384.8	14.08	2.217	0.451	358.0	840.6	1198.6	756.9	1114.2	0.5473	0.9955	1.5428	192.3
194.3	209	385.6	14.22	2.197	0.455	358.8	839.9	1198.8	756.2	1114.3	0.5483	0.9937	1.5420	194.3
196.3	211	386.4	14.36	2.177	0.459	359.6	839.3	1198.9	755.5	1114.4	0.5493	0.9920	1.5413	196.3
198.3	213	387.2	14.49	2.158	0.463	360.5	838.6	1199.1	754.7	1114.5	0.5503	0.9902	1.5405	198.3
200.3	215	388.0	14.63	2.138	0.468	361.4	837.9	1199.2	754.0	1114.6	0.5513	0.9885	1.5398	200.3
202.3	217	388.8	14.77	2.118	0.472	362.2	837.2	1199.4	753.3	1114.7	0.5523	0.9867	1.5390	202.3
204.3	219	389.5	14.90	2.100	0.476	363.0	836.5	1199.5	752.6	1114.8	0.5533	0.9850	1.5383	204.3
206.3	221	390.3	15.04	2.082	0.480	363.8	835.8	1199.6	751.9	1115 0	0.5543	0.9833	1.5376	206.3
208.3	223	391.1	15.17	2.064	0.485	364.6	835.1	1199.8	751.2	1115.1	0.5553	0.9816	1 5369	208.3
210.3	225	391.9	15.31	2.046	0.489	365.5	834.4	1199.9	750.5	1115.2	0.5562	0.9799	1.5361	210.3
212.3	227	392.6	15.45	2.030	0.493	366.3	833.8	1200.0	749.8	1115.3	0.5572	0.9783	1.5355	212.3
214.3	229	393.4	15.58	2.013	0.497	367.1	833.1	1200.2	749.1	1115.4	0.5582	0.9766	1.5348	214.3

*1 atmo (standard atmosphere) =760 mms. of Hg. by definition =29.921 ins. of Hg. =14.696 lbs. per sq. in.
$T° = t° + 459.6$; J =777.5 ft. lbs. per B.t.u. [log =2.89 071]; $A = 1/J = 1.286 \times 10^{-3}$; 144 A =0.1852 [log =1.26 664].

NOTE.—The gauge pressures are put in only for your guidance in making quick estimates of conditions. Wherever very accurate computations are to be made, find out the atmospheric pressure at your altitude and add this to the gauge pressure and use the resulting *absolute pressure* in the table.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 138 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/138

Gauge Press. lbs.	Absol. Press. lbs. p	Temp. Deg. F. t	Press. Atmos* —	Sp. Vol. cu. ft. per lb. v or s	Density lbs. per cu. ft 1/v	Heat of the liquid h or q	Latent heat of evap. L or r	Total heat of steam H	Internal Energy B.t.u. Evap. l or ρ	Internal Energy B.t.u. Steam E	Entropy Water no r θ	Entropy Evap. L/T or r/T	Entropy Steam N or φ	Gauge Press lbs.
216.3	231	394.1	15.72	1.996	0.501	367.9	832.4	1200.3	748.4	1115.5	0.5591	0.9750	1.5341	216.3
218.3	233	394.9	15.86	1.980	0.505	368.7	831.8	1200.4	747.7	1115.6	0.5601	0.9733	1.5334	218.3
220.3	235	395.6	15.99	1.964	0.509	369.4	831.1	1200.6	747.0	1115.7	0.5610	0.9717	1.5327	220.3
222.3	237	396.4	16.13	1.948	0.513	370.2	830.4	1200.7	746.4	1115.8	0.5619	0.9700	1.5319	222.3
224.3	239	397.1	16.26	1.932	0.518	371.0	829.8	1200.8	745.7	1115.9	0.5629	0.9684	1.5313	224.3
226.3	241	397.8	16.40	1.917	0.522	371.8	829.2	1200.9	745.0	1116.0	0.5638	0.9668	1.5306	226.3
228.3	243	398.5	16.53	1.902	0.526	372.6	828.5	1201.1	744.4	1116.1	0.5647	0.9653	1.5300	228.3
230.3	245	399.3	16.67	1.887	0.530	373.3	827.9	1201.2	743.7	1116.2	0.5655	0.9638	1.5293	230.3
232.3	247	400.0	16.81	1.872	0.534	374.1	827.2	1201.3	743.0	1116.3	0.5663	0.9623	1.5286	232.3
234.3	249	400.7	16.94	1.857	0.538	374.8	826.6	1201.4	742.4	1116.4	0.5672	0.9607	1.5279	234.3
235.3	250	401.1	17.01	1.850	0.541	375.2	826.3	1201.5	742.0	1116.4	0.5676	0.9600	1.5276	235.3
237.3	252	401.8	17.15	1.836	0.545	376.0	825.6	1201.6	741.4	1116.5	0.5685	0.9584	1.5269	237.3
239.3	254	402.4	17.28	1.822	0.549	376.7	825.0	1201.7	740.8	1116.6	0.5694	0.9569	1.5263	239.3
241.3	256	403.1	17.42	1.809	0.553	377.5	824.4	1201.8	740.1	1116.7	0.5702	0.9554	1.5256	241.3
243.3	258	403.8	17.56	1.795	0.557	378.2	823.7	1201.9	739.5	1116.8	0.5711	0.9539	1.5250	243.3
245.3	260	404.5	17.69	1.782	0.561	378.9	823.1	1202.1	738.9	1116.9	0.5719	0.9525	1.5244	245.3
247.3	262	405.2	17.83	1.769	0.565	379.6	822.5	1202.2	738.2	1117.0	0.5727	0.9511	1.5238	247.3
249.3	264	405.9	17.96	1.756	0.569	380.4	821.9	1202.3	737.6	1117.1	0.5735	0.9497	1.5232	249.3
251.3	266	406.6	18.10	1.743	0.574	381.1	821.3	1202.4	737.0	1117.2	0.5744	0.9482	1.5226	251.3
253.3	268	407.2	18.24	1.731	0.578	381.8	820.7	1202.5	736.4	1117.2	0.5752	0.9468	1.5220	253.3
255.3	270	407.9	18.37	1.718	0.582	382.5	820.1	1202.6	735.8	1117.3	0.5760	0.9454	1.5214	255.3
257.3	272	408.6	18.51	1.705	0.587	383.2	819.5	1202.7	735.1	1117.4	0.5768	0.9440	1.5208	257.3
259.3	274	409.2	18.64	1.693	0.591	383.9	818.9	1202.8	734.5	1117.5	0.5776	0.9426	1.5202	259.3
261.3	276	409.9	18.78	1.681	0.595	384.6	818.3	1202.9	733.9	1117.6	0.5784	0.9412	1.5196	261.3
263.3	278	410.5	18.92	1.669	0.599	385.3	817.7	1203.0	733.3	1117.6	0.5792	0.9398	1.5190	263.3
265.3	280	411.2	19.05	1.658	0.603	386.0	817.1	1203.1	732.7	1117.7	0.5800	0.9385	1.5185	265.3
267.3	282	411.8	19.19	1.646	0.608	386.7	816.5	1203.2	732.1	1117.8	0.5808	0.9371	1.5179	267.3
269.3	284	412.4	19.32	1.635	0.612	387.4	815.9	1203.3	731.5	1117.9	0.5816	0.9357	1.5173	269.3
271.3	286	413.1	19.46	1.624	0.616	388.1	815.4	1203.4	730.9	1118.0	0.5824	0.9344	1.5168	271.3
273.3	288	413.7	19.60	1.613	0.620	388.7	814.8	1203.5	730.3	1118.1	0.5832	0.9330	1.5162	273.3
275.3	290	414.4	19.73	1.602	0.624	389.4	814.2	1203.6	729.7	1118.1	0.5840	0.9316	1.5156	275.3
277.3	292	415.0	19.87	1.591	0.629	390.1	813.6	1203.7	729.2	1118.2	0.5848	0.9302	1.5150	277.3
279.3	294	415.6	20.01	1.581	0.633	390.8	813.0	1203.8	728.6	1118.3	0.5856	0.9289	1.5145	279.3
281.3	296	416.2	20.14	1.571	0.637	391.4	812.5	1203.9	728.0	1118.4	0.5863	0.9276	1.5139	281.3
283.3	298	416.8	20.28	1.561	0.641	392.1	811.9	1204.0	727.4	1118.4	0.5871	0.9263	1.5134	283.3
285.3	300	417.5	20.41	1.551	0.645	392.7	811.3	1204.1	726.8	1118.5	0.5878	0.9251	1.5129	285.3
295.3	310	420.5	21.09	1.502	0.666	395.9	808.5	1204.5	724.0	1118.9	0.5915	0.9187	1.5102	295.3
305.3	320	423.4	21.78	1.456	0.687	399.1	805.8	1204.9	721.2	1119.2	0.5951	0.9125	1.5076	305.3
355.3	370	437.2	25.18	1.264	0.791	414.0	792.8	1206.8	708.2	1120.8	0.6116	0.8840	1.4956	355.3
375.3	390	442.3	26.54	1.200	0.833	419.5	787.9	1207.4	703.3	1121.4	0.6178	0.8737	1.4915	375.3
385.3	400	444.7	27.22	1.17	0.86	422.	786.	1208.	701.	1122.	0.621	0.868	1.489	385.3
405.3	420	449.6	28.58	1.11	0.90	427.	780.	1208.	696.	1122.	0.627	0.858	1.485	405.3
455.3	470	460.9	31.98	0.99	1.01	440.	769.	1209.	685.	1123.	0.640	0.835	1.475	455.3
510.3	525	472.3	35.72	0.89	1.12	453.	757.	1210.	673.	1124.	0.654	0.813	1.467	510.3
560.3	575	481.9	39.13	0.81	1.24	464.	747.	1211.	663.	1125.	0.664	0.794	1.458	560.3
585.3	600	486.4	40.83	0.78	1.28	469.	742.	1211.	658.	1125.	0.670	0.784	1.454	585.3

*1 atmo (standard atmosphere) =760 mms. of Hg. by definition =29.921 ins. of Hg. =14.696 lbs. per sq. in.
$T° = t° + 459.6$; J =777.5 ft. lbs. per B.t.u. [log =2.89 071]; $A = 1/J = 1.286 \times 10^{-3}$; 144 A =0.1852 [log =1.26 764].

NOTE.—The gauge pressures are put in only for your guidance in making quick estimates of conditions. Wherever very accurate computations are to be made, find out the atmospheric pressure at your altitude and add this to the gauge pressure and use the resulting *absolute pressure* in the table.

Volume of Water at Various Pressures
At Saturation Temperatures Corresponding to Pressures Given

Gauge Pressure, Lbs. Per Sq. In.	Absolute Pressure, Lbs. Per Sq. In.	Specific Volume, V′ or O Cu. Ft. Per Lb.	Density, ↓, Lbs. Per Cu. Ft.	Energy of Expansion, 144 Ap V′ B. t. u.
.3	15	0.0167	59.8	0.05
25.3	40	0.0171	58.3	0.13
50.3	65	0.0174	57.4	0.21
75.3	90	0.0176	56.8	0.30
100.3	115	0.0178	56.0	0.38
125.3	140	0.0180	55.4	0.47
150.3	165	0.0182	54.9	0.56
175.3	190	0.0184	54.5	0.65
200.3	215	0.0185	54.0	0.74
225.3	240	0.0186	53.6	0.83
265.3	280	0.0189	53.0	0.98
435.3	450	0.0197	50.8	1.65

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 139 of 154
asbestosclaims.law/library/21286/139

Minimum Thicknesses of Steam Pipe Insulation That Should Be Used for Given Character of Service

Steam Pressures	Steam Temperatures	Thickness of Insulation for Pipes Larger than 4" in Size	Thickness of Insulation for Pipes 2" to 4" in Size	Thickness of Insulation for Pipes 1" to 1½"
0 to 25 lbs.	212° to 267° F.	1" or Standard*	1" or Standard*	1" or Standard*
25 to 100 lbs.	267° to 338° F.	1½"	1½"	1" or Standard*
100 to 200 lbs.	338° to 388° F.	2" or D'ble Standard*	1½"	1" or Standard*
Higher Pressures or Superheat	388° to 500° F. 500° to 600° F.	2½" 3"	2" or D'ble Standard* 2½"	1½" 2" or D'ble Standard*

For higher temperatures obtain special recommendations.

*Standard and Double Standard thickness apply to 85% Magnesia Insulation only—other thicknesses apply to all types of insulation.

It is always preferable to apply insulation greater than 1½-inch thickness in two or more layers with all joints broken or staggered.

Table Showing Loss Due to Steam-Leakage

Size of Orifice	Lbs. Steam Wasted Per Month	Cost of Coal Per Month	Cost of Water Wasted at 10c. 1000 Gal.	Total Cost Per Month	Total Cost Per Year
ONE HUNDRED POUNDS GAUGE PRESSURE					
½"	835,000	$184.00	$10.00	$194.00	$2,330.00
⅜"	470,000	104.00	5.65	109.65	1,320.00
¼"	210,000	44.00	2.52	46.52	560.00
⅛"	52,500	11.50	.63	12.13	144.00
1/16"	13,200	2.90	.16	3.06	36.70
1/32"	3,400	.75	.04	.79	9.50
ONE HUNDRED AND FIFTY POUNDS GAUGE PRESSURE					
½"	1,200,000	$264.00	$14.40	$278.40	$3,340.00
⅜"	675,000	148.00	8.10	156.10	1,870.00
¼"	300,000	66.00	3.50	69.60	840.00
⅛"	75,000	16.50	.90	17.40	204.00
1/16"	19,000	4.20	.23	4.43	53.00
1/32"	4,800	1.05	.06	1.11	13.30

The tables were based on coal costing $3.50 per ton delivered in the furnace; one pound of coal having an assumed heat value of 13,000 B.t.u. and an evaporation of 8 pounds of water from and at 212 degrees per pound of coal. Cost of water is an average obtained from several towns. It appears quite evident that the time consumed in searching for steam leaks will be fully repaid, with interest.—S. D. Jackson, in "The Southern Engineer."

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 140 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/140

Heat Losses from Uninsulated Hot Surfaces

Ordinary Steam Temperatures

TEMPERATURE OF SURROUNDING AIR 70° F.

Steam Pressure (Gauge)	Steam Temperature (Deg. Fahr.)	Difference between Temperature of Steam and Surrounding Air (Deg. Fahr.)	Loss Per Sq. Ft. Per Hour (B.t.u.)	Waste of Coal in Lbs. Per Sq. Ft. Per Year	Number of Sq. Ft. of Surface That Wastes a Ton of Coal in 1 Year
0	212	142	334	293	6.82
10	240	170	425	372	5.38
25	267	197	522.5	458	4.37
50	298	228	644	564	3.55
75	320	250	737.5	646	3.10
100	338	268	820	718	2.79
150	366	296	960	840	2.38
200	388	318	1,079	945	2.12
250	406	336	1,184	1,036	1.93

Heat Losses from Uninsulated Hot Surfaces

Temperatures Lower Than 212 Deg. F.

Surface Temperature (Deg. Fahr.)	Difference between Surface Temperature and Surrounding Air (Deg. Fahr.)	Heat Loss Per Sq. Ft. Per Hour (B.t.u.)	Waste of Coal in Lbs. Per Sq. Ft. Per Year	Number of Sq. Ft. of Surface That Wastes a Ton of Coal in 1 Year
100	30	56.6	49.6	40.3
120	50	97.5	85.4	23.4
140	70	142.	124.3	16.1
160	90	190.	166.3	12.03
180	110	242.	212.	9.44
200	130	298.5	261.5	7.65

Above figures involving waste of coal are based on 10,000 B. t. u. available per pound of coal, which is equivalent to a boiler efficiency of 70% using coal with an assumed heat value of about 14,000 B.t.u. per pound.

These figures are very conservative, as both the boiler efficiency and the heat value of the coal are high—a lesser boiler efficiency or inferior grade of coal would cause even a greater waste in pounds of fuel.

The figures are based also on continuous service, 24 hours per day.

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 141 of 154
asbestosclaims.law/library/21286/141

Table of Data on Standard Full-Weight Wrought-Iron and Steel Pipe

Diameter: Nominal Internal, In.	Diameter: Actual External, In.	Diameter: Approx. Internal, In.	Nominal Thickness, In.	Circumference: External, In.	Circumference: Internal, In.	Transverse Areas: External, Sq. In.	Transverse Areas: Internal, Sq. In.	Transverse Areas: Metal, Sq. In.	Length of Pipe per Sq. Ft. of: External Surface, Ft.	Length of Pipe per Sq. Ft. of: Internal Surface, Ft.	Length of Pipe Containing 1 Cu. Ft., Ft.	Nominal Weight per Ft., Lbs.	No. of Threads per In. of Screw	Area External Surface per Lineal Foot, Sq. Ft.
⅛	0.405	0.27	0.068	1.27	0.85	0.13	0.06	0.07	9.44	14.15	2513.00	0.24	27	.106
¼	0.540	0.36	0.083	1.70	1.14	0.23	0.10	0.12	7.08	10.49	1383.30	0.42	18	.141
⅜	0.675	0.49	0.091	2.12	1.55	0.36	0.19	0.17	5.66	7.76	751.20	0.57	18	.177
½	0.840	0.62	0.109	2.63	1.95	0.55	0.30	0.25	4.55	6.15	472.40	0.85	14	.220
¾	1.050	0.82	0.113	3.30	2.59	0.87	0.53	0.33	3.64	4.64	270.00	1.13	14	.275
1	1.315	1.05	0.134	4.13	3.29	1.36	0.86	0.50	2.90	3.65	166.90	1.68	11½	.344
1¼	1.660	1.38	0.140	5.22	4.34	2.16	1.50	0.67	2.30	2.77	96.25	2.27	11½	.435
1½	1.900	1.61	0.145	5.97	5.06	2.84	2.04	0.80	2.01	2.37	70.66	2.72	11½	.498
2	2.375	2.07	0.154	7.46	6.49	4.43	3.36	1.07	1.61	1.85	42.91	3.65	11½	.622
2½	2.875	2.47	0.204	9.03	7.75	6.49	4.78	1.71	1.33	1.55	30.10	5.79	8	.753
3	3.500	3.07	0.217	11.00	9.63	9.62	7.39	2.24	1.09	1.25	19.50	7.57	8	.917
3½	4.000	3.55	0.226	12.57	11.15	12.57	9.89	2.68	0.96	1.08	14.57	9.11	8	1.047
4	4.500	4.03	0.237	14.14	12.65	15.90	12.73	3.18	0.85	0.95	11.31	10.79	8	1.178
4½	5.000	4.51	0.246	15.71	14.16	19.64	15.96	3.68	0.76	0.85	9.02	12.54	8	1.309
5	5.563	5.05	0.259	17.48	15.85	24.31	19.99	4.32	0.69	0.76	7.20	14.62	8	1.456
6	6.625	6.07	0.280	20.81	19.05	34.47	28.89	5.59	0.58	0.63	4.98	18.97	8	1.734
7	7.625	7.02	0.301	23.96	22.06	45.66	38.74	6.92	0.50	0.54	3.72	23.54	8	1.996
8	8.625	8.07	0.276	27.10	25.35	58.43	51.15	7.28	0.44	0.47	2.82	24.69	8	2.257
8	8.625	7.98	0.322	27.10	25.07	58.43	50.02	8.41	0.44	0.48	2.88	28.55	8	2.257
9	9.625	8.94	0.344	30.24	28.08	72.76	62.72	10.04	0.40	0.43	2.29	33.91	8	2.519
10	10.750	10.19	0.278	33.77	32.01	90.76	81.55	9.21	0.36	0.37	1.76	31.20	8	2.817
10	10.750	10.14	0.306	33.77	31.86	90.76	80.75	10.01	0.36	0.38	1.78	34.24	8	2.817
10	10.750	10.02	0.366	33.77	31.47	90.76	78.82	11.94	0.36	0.38	1.82	40.48	8	2.817
11	11.750	11.00	0.375	36.91	34.56	108.43	95.03	13.40	0.33	0.35	1.51	45.56	8	3.073
12	12.750	12.09	0.328	40.06	37.98	127.68	114.80	12.88	0.30	0.32	1.25	43.77	8	3.337
12	12.750	12.00	0.375	40.06	37.70	127.68	113.10	14.59	0.30	0.32	1.27	49.56	8	3.338
14OD	14.000	13.25	0.375	43.96	41.60	153.86	137.81	16.05	0.27	0.29	1.04	54.57	8	3.663
15OD	15.000	14.25	0.375	47.10	44.70	176.62	159.39	17.23	0.25	0.27	0.90	58.57	8	3.927
16OD	16.000	15.25	0.375	50.27	47.90	200.96	182.55	18.41	0.24	0.25	0.75	62.58	8	4.188

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 142 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/142

Service Index

This index shows page numbers of Johns-Manville Insulations recommended for given service.

Insulations

High Pressure Steam

	Page
PIPE INSULATIONS	
Asbesto-Sponge Felted	9 to 13
85% Magnesia	14 to 18
SHEETS AND BLOCKS	
Asbesto-Sponge Felted	32
85% Magnesia	33
CEMENTS	
No. 302	44
No. 400	44
UNDERGROUND	
Underground System of Insulation	45 to 53

Medium and Low Pressure Steam

PIPE INSULATIONS	
Asbesto-Sponge Felted	9 to 13
85% Magnesia	14 to 18
Asbestocel	19 to 22
SHEETS AND BLOCKS	
Asbesto-Sponge Felted	32
85% Magnesia	33
Asbestocel	37
CEMENTS	
No. 302	44
No. 400	44
UNDERGROUND	
Underground System of Insulation	45 to 53

Hot Water

PIPE INSULATION	
Asbestocel	19 to 22
SHEETS AND BLOCKS	
Asbestocel	37
CEMENTS	
No. 302	44
No. 400	44

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 143 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/143

Service Index—Continued

Hot Water—Continued

UNDERGROUND — Page
Underground System of Insulation ..... 45 to 53

Cold Water

PIPE INSULATION
Built-up Hair Felt 26
Anti-Sweat 27, 28
Zero 29

Brine and Ammonia

PIPE INSULATION
Built-up Brine and Ammonia 26

Refrigeration

Insulating Materials 39

Packings

This Index shows page numbers of Johns-Manville Packings recommended for given service.

Air

ROD PACKINGS — Page
Sea Rings ..... 56 to 61
Universal 62
Kearsarge 63
Jewett Rings 74
Mogul Coil 65
SHEET PACKINGS
Service 81, 82
Seigelite 83
Kearsarge 84
GASKETS
Service 88
Seigelite 88
AIR PUMP
Keystone 66
Vulcabeston 67
Kearsarge 68
Combination 69
AIR BRAKE
Air Brake Cylinder Slip-Type Expander Ring 73
Air Brake Cylinder Packing Cup 73

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 144 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/144

Service Index—*Continued*

Ammonia

	Page
ROD PACKINGS	
Universal	76
Mogul Coil	65
SHEET PACKINGS	
Service	81, 82
GASKETS	
Service	88
WASHERS	
Vulcabeston	87

High Pressure Steam

ROD PACKINGS	
Sea Rings	56 to 61
Universal	62
Kearsarge	63
Jewett Rings	74
Mogul Coil	65
SHEET PACKINGS	
Service	81, 82
Kearsarge	84
GASKETS	
Kearsarge Manhole, Handhole and Tube Plate	85
Service Flange Joint	88
GASKETING AND GASKETING TAPES	
Kearsarge Asbesto-Metallic	86
Kearsarge Tubular	87
THROTTLE VALVE STEM PACKING	
Kearsarge	70
MALLET LOCOMOTIVE PACKING	71
REVERSE GEAR PISTON PACKING	72

Medium and Low Pressure Steam

ROD PACKINGS	
Sea Rings	56 to 61
Universal	62
Kearsarge	63
Jewett Rings	74
Mogul Coil	65
SHEET PACKINGS	
Service	81, 82
Kearsarge	84
GASKETS	
Kearsarge Manhole, Handhole and Tube Plate	85
Service Flange Joint	88

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 145 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/145

Service Index—Continued

GASKETING AND GASKETING TAPE — Page
- Kearsarge Asbesto-Metallic — 86
- Kearsarge Tubular — 87

Hydraulic

PISTON PACKINGS
- Universal — 75

ROD AND PLUNGER PACKINGS
- Sea Rings — 56 to 61
- Universal — 62
- Duplex — 64
- Jewett Rings — 74
- Mogul Coil — 65

SHEET PACKINGS
- Service — 81, 82
- Seigelite — 83

GASKETS
- Service — 88
- Seigelite — 88

GASKETING AND GASKETING TAPE
- Kearsarge Asbesto-Metallic — 86

PUMP VALVES
- Vulcabeston — 89, 90

Oil

ROD PACKINGS
- Sea Rings — 56 to 61
- Jewett Rings — 74
- Mogul Coil — 65
- Universal, Style Nos. 36, 37, 38 — 75

SHEET PACKINGS
- Seigelite — 83
- Service — 81, 82

GASKETS
- Seigelite — 88
- Service — 88

PUMP VALVES
- Vulcabeston — 89, 90

Chemicals and Acids

ROD PACKINGS
- Sea Rings — 56 to 61
- Mogul Coil — 65
- Wick — 77
- Rope — 77

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 146 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/146

Service Index—Continued

SHEET PACKING
- Service 81, 82
- Seigelite 83
- Kearsarge Asbesto-Metallic 84

GASKETS
- Seigelite 88
- Service 88

GASKETING AND GASKETING TAPE
- Kearsarge Asbesto-Metallic 86
- Kearsarge Tubular 87

PUMP VALVES
- Vulcabeston 89, 90

Gasoline and Gas Engines

ROD PACKINGS
- Sea Rings ..... 56 to 61
- Mogul Coil 65
- Jewett 74

SHEET PACKINGS
- Service 81, 82
- Seigelite 83
- Mobilene 84

GASKETS
- Service 88
- Seigelite 88

Pump Valves

- Vulcabeston 89, 90
- Rubber 89

Steam Hammer Rod Packing

- Sea Rings ..... 56 to 61
- Universal 76
- Kearsarge 63

Power Plant Specialties

This index shows page numbers of Johns-Manville products recommended for given conditions

Steam Traps

FOR GENERAL POWER PLANT EQUIPMENT
- Johns-Manville Steam Trap ..... 92 to 99

FOR COILS, SMALL APPARATUS, ETC.
- Johns-Manville Junior Steam Trap 96

FOR RADIATORS
- Johns-Manville Radiator Trap 97

Refractory Cements

- Boiler Settings ..... 121 to 129
- Baffle Walls 127, 128

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 147 of 154
asbestosclaims.law/library/21286/147

Service Index—Continued

Boiler Wall Coating

FOR PREVENTING INFILTRATION OF AIR THROUGH BOILER WALLS
Aertite 106

Brake and Clutch Linings and Facings

FOR LINING BRAKE BANDS, CLUTCH FACES, ETC.
Asbesto-Metallic Friction Blocks 100–104
Non-Burn Brake Lining 104, 105

Hot Air Furnace Pipes

Asbestocel (In Flexible Roll Form) 37

Stack, Breeching and Duct Linings and Insulations

Thermo and Vitro Fire-Felt Sheets and Blocks 34
Vitribestos Sheets 36
85% Magnesia Blocks 33
Asbestocel Sheets and Blocks 37

Kiln and Dry Room Insulation

Special Construction 40

Locomotive Insulation

BLOCKS
85% Magnesia Lagging 33
Fire-Felt Lagging 35
TRAIN PIPE INSULATION
Asbesto-Sponge Felted 9–13
Fire-Felt 9

Special Conditions

such as { Oil Still Insulation ..... / Tank Insulation ..... / Hot Blast Stove Insulation . } Various Johns-Manville Insulating materials are adapted for such conditions and we recommend conferring with our nearest branch so that proper material is used according to conditions.

Technical Data and Tables

For convenience, the following tables and page numbers on which they appear are given for ready reference.

Efficiencies of Asbesto-Sponge Felted Sectional Pipe Insulation 10, 11
Efficiencies of 85% Magnesia Sectional Pipe Insulation 15, 16
Efficiencies of Asbestocel Sectional Pipe Insulation 20
Heat Transmission Through Johns-Manville Built-up Brine and Ammonia Insulation 26
Weights of Sectional Pipe Insulation 30
Efficiencies of Asbesto-Sponge Felted Sheets and Blocks 41
Efficiencies of 85% Magnesia Blocks 41
Efficiencies of Asbestocel Sheets and Blocks 41, 42
Efficiencies of Thermo Fire-Felt Sheets and Blocks 42
Weights of Sheets and Blocks 43
How to Use Tables of Pipe Insulation Efficiency .. 132
Heat Loss from Bare Pipes 133
Steam Tables 133–136
Volume of Water at Various Pressures 136
Loss Due to Steam Leakage 137
Minimum Thickness of Pipe Insulation 137
Heat Loss from Uninsulated Hot Surfaces 138
Data on Wrought Iron and Steel Pipe 139

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 148 of 154
asbestosclaims.law/library/21286/148

Material Index

—A—

	Page
Aertite Boiler Wall Coating	106
Air Brake Cylinder Expander Ring	73
Air Brake Cylinder Gasket, Molded Asbestos	72
Air Brake Cylinder Packing Cup	73
Air Brake Cylinder Packing Set	73
Air-Cell Sectional Pipe Insulation	23
Air-Cell Sheets and Blocks	37
Air Pump Packing, Combination	69
Air Pump Packing, Kearsarge	68
Air Pump Packing, Keystone	66
Air Pump Packing, Vulcabeston	67
Ammonia Packing, Universal	76
Anti-Sweat Sectional Pipe Insulation	27-28
Asbestocel in Roll Form	37
Asbestocel Sectional Pipe Insulation	19-22
Asbestocel Sheets and Blocks	37
Asbesto-Metallic Friction Blocks and Clutch Facing	100-104
Asbesto-Metallic Gasketing Tape, Kearsarge	86
Asbesto-Metallic Manhole, Handhole and Tube Plate Gaskets, Kearsarge	85
Asbesto-Metallic Tubular Gasketing, Kearsarge	87
Asbesto-Sponge Felted Sectional Pipe Insulation	9-13
Asbesto-Sponge Felted Sheets and Blocks	32
Asbesto-Sponge Felted Train Pipe Insulation	9
Asbestos Cord	77
Asbestos Fire-Felt Sheets and Blocks	35
Asbestos Paper and Roll Board	38
Asbestos Roll Fire-Felt	35
Asbestos Sheet Millboard	38
Asbestos Wick and Rope Packing	77
Asbestos Wood, Ebony	108
Asbestos Wood, Transite	107

—B—

	Page
Baffle Walls, Monolithic	127–128
Bare Pipe, Heat Loss from	133
Blocks, 85% Magnesia	33
Blocks and Sheets, Air Cell	37
Blocks and Sheets, Asbestocel	37
Blocks and Sheets, Asbestos Fire-Felt	35
Blocks and Sheets, Asbesto-Sponge Felted	32
Blocks and Sheets, Thermo Fire-Felt	34
Blocks and Sheets, Vitribestos	36
Blocks and Sheets, Vitro Fire-Felt	34
Boiler Wall Coating, Aertite	106
Brake Band Lining, Non-Burn	104, 105
Brake Blocks and Clutch Facing, Asbesto-Metallic	100–104
Branch and Main-Line Cutout Bases, Noark	114–118
Brine and Ammonia Built-up Insulation	26

—C—

	Page
Cab Cock Packing, Locomotive	70
Ceilings, Insulation of	40
Cements, Insulating	44
Cements, Refractory	121–129
Cements, Refractory, Directions for Applying	124, 125
Cements, Refractory, Technical Data on	126
Clutch Facing and Friction Blocks, Asbesto-Metallic	100-104
Coating, Boiler Wall, Aertite	106
Coil Packing, Mogul	65
Combination Air Pump Packing	69
Compounds, Splicing, Rubber	120
Cord, Asbestos	77
Cutout Bases, Main Line and Branch, Noark	114–118

—D—

	Page
Data on Wrought Iron and Steel Pipe	139
Directions for Applying Refractory Cements	124, 125
Dry Rooms, Insulation of	40
Duplex Rod and Plunger Packing	64

—E—

	Page
Ebony Asbestos Wood	108
Efficiencies of Asbestocel Sectional Pipe Insulation	20
Efficiencies of Asbestocel Sheets and Blocks	41, 42
Efficiencies of Asbesto-Sponge Felted Sectional Pipe Insulation	10, 11
Efficiencies of Asbesto-Sponge Felted Sheets and Blocks	41
Efficiencies of 85% Magnesia Sectional Pipe Insulation	15, 16
Efficiencies of 85% Magnesia Blocks	41
Efficiencies of Thermo Fire-Felt Sheets and Blocks	42
Eighty-five per cent. Magnesia Blocks	33
Eighty-five per cent. Magnesia Locomotive and Air Pump Lagging	33
Eighty-five per cent. Magnesia Sectional Pipe Insulation	14–18
Enclosed Fuses, Noark	109, 110
Expander Ring, Air Brake Cylinder	73

—F—

	Page
Fire-Felt, Asbestos Roll	35
Fire-Felt, Asbestos, Sheets and Blocks	35
Fire-Felt, Thermo, Sheets and Blocks	34
Fire-Felt, Vitro, Sheets and Blocks	34
Flange Joint Gaskets, Seigelite	88
Flange Joint Gaskets, Service	88
Friction Blocks, and Clutch Facing, Asbesto-Metallic	100-104
Friction Tapes	119
Fuses, Enclosed, Noark	109, 110
Fuses, Renewable, Noark	111–113

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 149 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/149

Material Index—Continued

—G—

	Page
Gasketing Tape, Kearsarge Asbesto-Metallic	86
Gasketing, Tubular, Kearsarge Asbesto-Metallic	87
Gaskets, Flange Joint, Seigelite	88
Gaskets, Flange Joint, Service	88
Gaskets, Handhole, Manhole and Tube Plate, Kearsarge Asbesto-Metallic	85
Gaskets, Brake Cylinder, Molded Asbestos	72
Gaskets, Top Head and Bottom Head for Air Pumps	88

—H—

Hair Felt Pipe Insulation, Built-up	26
Hair Felt, Standard	39
Handhole, Manhole and Tube Plate Gaskets, Kearsarge Asbesto-Metallic	85
Heat Loss from Bare Pipe	133
Heat Loss from Uninsulated Hot Surfaces	138
Hot Surfaces, Uninsulated, Heat Losses from	138
How to Use Tables of Pipe Efficiency	132
High Temperature Cements	121-129

—I—

Insulating Cements	44
Insulation for Dry Rooms, Kilns, Ceilings, etc	40
Insulation, Underground System of	45–53
Insulations, List Prices of Sectional Pipe	30
Insulations, List Prices of Sheets and Blocks	43
Insulations, Weights and Standard Sizes, Sheets and Blocks	43

—J—

Jewett Ring Packing	74
Junior Steam Trap	96

—K—

Kearsarge Air Pump Packing	68
Kearsarge Asbesto-Metallic Gasketing Tape	86
Kearsarge Asbesto-Metallic Gaskets, Manhole, Handhole and Tube Plate	85
Kearsarge Asbesto-Metallic Sheet Packing	84
Kearsarge Asbesto-Metallic Tubular Gasketing	87
Kearsarge Rod Packing	63
Kearsarge Throttle Valve Packing	70
Keystone Air Pump Packing	66
Kilns, Insulation of	40

—L—

Lagging, Locomotive and Air Pump 85% Magnesia	33
Liberty Red Rubber Sheet Packing	84
Lining, Brake Band, Non-Burn	104, 105
List Prices of Insulations, Sheets and Blocks	43
List prices of Sectional Pipe Insulations	30
Locomotive Cab Cock Packing	70
Loss Due to Steam Leakage	137

—M—

Mallet Packing	71
Main-Line and Branch Cutout Bases, Noark	114–118
Manhole, Handhole and Tube Plate Gaskets, Kearsarge Asbesto-Metallic	85
Millboard, Asbestos Sheet	38
Minimum Thicknesses of Pipe Insulation	137
Mobilene Sheet Packing	84
Mogul Coil Packing	65
Monolithic Baffle Walls	127–128

—N—

Noark Enclosed Fuses	109, 110
Noark Main-Line and Branch Cutout Bases	114–118
Noark Renewable Fuses	111–113
Non-Burn Brake Band Lining	104, 105

—P—

Packing, Air Pump, Combination	69
Packing, Air Pump, Kearsarge	68
Packing, Air Pump, Keystone	66
Packing, Air Pump, Vulcabeston	67
Packing Cup, Air Brake Cylinder	73
Packing, Duplex Rod and Plunger	64
Packing, Jewett Ring	74
Packing, Kearsarge Asbesto-Metallic Sheet	84
Packing, Kearsarge Rod	63
Packing, Liberty Red Rubber Sheet	84
Packing, Locomotive Cab Cock	70
Packing, Mallet	71
Packing, Mobilene Sheet	84
Packing, Mogul Coil	65
Packing, Reverse Gear	72
Packing, Sea Rings	56–61
Packing, Seigelite Sheet	83
Packing, Service Sheet	81, 82
Packing, Set, Air Brake Cylinder	73
Packing, Throttle Valve, Kearsarge	70
Packing, Universal Ammonia	76
Packing, Universal Piston	75
Packing, Universal Rod and Plunger	62
Packing, Universal Steam Hammer	76
Packing, Wick and Rope, Asbestos	77
Paper and Roll Board, Asbestos	38
Pipe Insulation, Air-Cell Sectional	23
Pipe Insulation, Anti-Sweat Sectional	27, 28
Pipe Insulation, Asbesto-Sponge Felted Sectional	9–13
Pipe Insulation, Asbestocel Sectional	19–22
Pipe Insulation, Brine and Ammonia Built-up	26
Pipe Insulation, 85% Magnesia Sectional	14–18
Pipe Insulation, Hair Felt, Built-up	26
Pipe Insulation, Minimum Thicknesses of	137
Pipe Insulation, Prices	30
Pipe Insulation, Weights	30
Pipe Insulation, Wool Felt Sectional	24
Pipe Insulation, Zero Sectional	29
Pipe, Wrought Iron and Steel, Data on	139
Piston Packing, Universal	75
Pump Valves, Rubber	89
Pump Valves, Vulcabeston	89, 90

—R—

Radiator Traps	97
Refractory Cements	121–129
Refractory Cements, Directions for Applying	124, 125
Refractory Cements, Technical Data on	126
Renewable Fuses, Noark	111–113
Reverse Gear Piston Packing	72
Ring Packing, Jewett	74
Rod and Plunger Packing	55–79
Rod and Plunger Packing Universal	62
Rod Packing, Kearsarge	63

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 150 of 154
asbestosclaims.law/library/21286/150

Material Index—Continued

R—Continued Page

Roll Asbestocel..... 37
Roll Board and Paper, Asbestos..... 38
Roll Fire-Felt, Asbestos..... 35
Rope Packing, Asbestos..... 77
Rubber Pump Valves..... 89
Rubber Splicing Compounds..... 120

—S—

Sea Rings.....56, 61
Seigelite Flange Joint Gaskets..... 88
Seigelite Sheet Packing..... 83
Service Flange Joint Gaskets..... 88
Service Sheet Packing.....81, 82
Sheet Millboard, Asbestos..... 38
Sheet Packing, Liberty Red Rubber..... 84
Sheet Packing, Kearsarge Asbesto-Metallic..... 84
Sheet Packing, Mobilene..... 84
Sheet Packing, Seigelite..... 83
Sheet Packing, Service..... 81, 82
Sheets and Blocks, Air Cell..... 37
Sheets and Blocks, Asbestocel..... 37
Sheets and Blocks, Asbestos Fire-Felt..... 35
Sheets and Blocks, Asbesto-Sponge Felted..... 32
Sheets and Blocks, List Prices of Insulations... 43
Sheets and Blocks, Thermo Fire-Felt..... 34
Sheets and Blocks, Vitribestos..... 36
Sheets and Blocks, Vitro Fire-Felt..... 34
Sheets and Blocks, Weights and Standard Sizes. 43
Smoke Flues, Insulation of..... 40
Specifications for Anti-Sweat Sectional Pipe Insulation..... 28
Specifications for Asbestocel Sectional Pipe Insulation..... 21
Specifications for Asbesto-Sponge Felted Sectional Pipe Insulation..... 12
Specifications for 85% Magnesia Sectional Pipe Insulation..... 17
Specifications for Underground System of Insulation.....50, 51
Specifications, Sea Rings..... 60
Specifications, Steam Traps..... 98
Splicing Compounds, Rubber..... 120
Steam Hammer Packing, Universal..... 76
Steam Leakage, Loss Due to..... 137
Steam Tables..... 133–136
Steam Trap, Junior..... 96
Steam Traps.....92–99

—T—

Tables, Pipe Insulation Efficiency, How to Use.. 132
Tables, Steam.....133–136
Table, Efficiencies of Asbestocel Sectional Pipe Insulation..... 20
Table, Efficiency of Asbestocel Sheets and Blocks 41-42

T—Continued Page

Table, Efficiencies of Asbesto-Sponge Felted Sectional Pipe Insulation.....10, 11
Table, Efficiencies of Asbesto-Sponge Felted Sheets and Blocks..... 41
Table, Efficiencies of 85% Magnesia Sectional Pipe Insulation.....15, 16
Table, Efficiencies of 85% Magnesia Blocks.... 41
Table, Efficiencies of Thermo Fire-Felt Sheets and Blocks..... 42
Tape, Kearsarge Asbesto-Metallic Gasketing.... 86
Tapes, Friction..... 119
Technical Data on Refractory Cements..... 126
Thermo Fire-Felt Sheets and Blocks..... 34
Throttle Valve Packing, Kearsarge..... 70
Train Pipe Insulation, Asbesto-Sponge Felted... 9
Transite Asbestos Wood..... 107
Trap, Radiator..... 97
Trap, Steam, Junior..... 96
Traps, Steam.....92–99
Tube Plate, Manhole and Handhole Gaskets, Kearsarge Asbesto-Metallic..... 85
Tubular Gasketing, Kearsarge Asbesto-Metallic 87

—U—

Underground System of Insulation.....45–53
Uninsulated Hot Surfaces, Heat Losses from.... 138
Union Washers, Vulcabeston..... 87
Universal Ammonia Packing..... 76
Universal Piston Packing..... 75
Universal Rod and Plunger Packing..... 62
Universal Steam Hammer Packing..... 76

—V—

Valves, Pump, Rubber..... 89
Valves, Pump, Vulcabeston.....89, 90
Vitribestos Sheets and Blocks..... 36
Vitro Fire-Felt Sheets and Blocks..... 34
Volume of Water at Various Pressures..... 136
Vulcabeston Air Pump Packing..... 67
Vulcabeston Pump Valves.....89, 90
Vulcabeston Union Washers..... 87

—W—

Walls, Baffle, Monolithic.....127–128
Washers, Union, Vulcabeston..... 87
Water, Volume of, at Various Pressures..... 136
Weights and Standard Sizes of Insulations, Sheets and Blocks..... 43
Weights of Sectional Pipe Insulations..... 30
Wick and Rope Packing, Asbestos..... 77
Wood, Asbestos, Ebony..... 108
Wood, Asbestos, Transite..... 107
Wool Felt Sectional Pipe Insulation..... 24

—Z—

Zero Sectional Pipe Insulation..... 29

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 151 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/151

Packing Style Number Index

Style No.	Page	Style No.	Page	Style No.	Page
3	74	195	77	775	68
10	74	196	77	787	77
15	68,69,70	199	77	788	77
20	74	200	77	800	66
28	76	202	77	812	77
29	76	203	77	834	77
30	62	206	89	873	77
31	62	210	70	875	68
32	62	222	65	900	66
33	75	268	67	975	68
34	75	300	66	1000	66
35	75	310	74	1015	69
36	75	368	67	1055	69
37	75	371	64	1075	68
38	75	372	64	1100	66
40	74	373	64	1115	69
49	71	400	67	1155	69
55	69	404	67	1175	68
60	81	416	89	1215	69
61	88	420	89	1255	69
70	75	424	89	1315	69
100	84	440	67	1355	69
101	84	475	68	1415	69
107	84	500	66	1455	69
116	85	544	67	1515	69
117	85	566	77	1555	69
118	85	575	68	1572	67
119	85	600	66	1615	69
120	86	675	68	1655	69
124	87	700	66	1715	69
150	63	702	77	1755	69
166	63	711	83	4195	77
168	67	712	88	4444	67
193	65	733	77		

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
ACL Doc 21286 · Page 152 of 154
Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/152

Other Johns-Manville Products

Acoustics, Architectural.
Asbestos Cloth.
Asbestos Goods of Every Description.
Automotive Equipment.
Automotive Packings.
Booths, Transite Asbestos Wood Moving Picture Machine.
Boxes, Service Subway.
Brake Band Lining.
Building Materials:
- Asbestos Roofings and Insulating Felts.
- Asbestos Roofings in Every Form: Ready-to-Lay, Built-Up, Corrugated, and Shingles.
- Asbestos Shingles.
- Asbestos Siding (Asbestoside).
- Asbestos Slater's Felt
- Building Paper (Weathertite).
- Cold Water Paint—Inside and Outside.
- Keystone Hair Insulator (for sound deadening, heat and cold insulation).
- Mastic Flooring.
- Transite Asbestos Wood.
- Waterproofing.
- Waterproofing Asphalts, Coatings, Cements and Felts.
- Rag Felt Type Ready-to-Lay Roofings.

Cements, Insulating, Roof, Iron, Pipe-Joint.
Clothing, Gloves, etc., Asbestos.
Clutch Facings.
Compounds, Iron and Splicing.
Conduit, Sectional Underground and Fibre.
Cork, Granulated, Sheets, Sectional Insulation.
Curtains, Asbestos, Theatre.
Electrical Supplies:
- Fibre Conduit.
- Fibre Products.
- Insulating Materials.
- Meter Protective Devices.
- Molded Insulations.
- Railway Products.
- Sockets, Molded, Waterproof Lamp.
- Subway Boxes.
- Weatherproof Lamp Sockets.

Fibre, Indurated, Vulcanized Hard.
Fire Fighting Equipment:
- Asbestos Blankets, for smothering small fires.
- Asbestos Fire Drags, for fighting field fires.
- Johns-Manville Chemical Engines.
- Success Chemical Engine.
- Success Extinguisher (2½ gal. upset type).
- Success Non-Freezing Extinguisher (2½ gal. hand pump type).

Glass Workers' Materials.
Household Specialties, Asbestos Table Covers and Mats, Boiler Covers, Iron Holders, Baking Sheets.
Iron Fillers, Compounds and Fillers.
Insulating Materials, Electrical.
Laundry Felts.
Linings, Asbestos Stove and Furnace.
Packings, Automotive Sheet and Coil.
Paper Asbestos, Fire and Damp-Proof.
Refrigerating Machines.
Rope, Cord, Twine, Asbestos Specialties.
Service Meter Protective Devices.
Shingles, Asbestos Fireproof.
Smoke Stack Lining.
Sockets, Molded, Waterproof Lamp.
Speedometers, Tachometers, Hub Odometers, Recorders.
Textiles, Asbestos.

WRITE FOR BOOKLETS

Johns-Manville Service to Power Users: Catalog No. 117, Second Edition (1920)
Published by AsbestosClaims.Law
ACL Doc 21286 · Page 153 of 154
asbestosclaims.law/library/21286/153

Published by AsbestosClaims.Law
asbestosclaims.law/library/21286/154