

Space limitations do not permit the insertion of complete efficiency tables, pipe sizes, insulation thickness, etc. If you do not find the size you want, write to the nearest Johns-Manville Division sales office.

**JOHNS-MANVILLE 85% MAGNESIA INSULATION**

An efficient insulation for steam lines to 600 deg. Fahr.

**EFFICIENCIES**

| Pipe Size<br>Inches                                                              | Nominal<br>Insulation<br>Thickness<br>Inches |                        | Temperature Difference Between Pipe and Surrounding Air, Deg. Fahr.       |        |        |        |         |
|----------------------------------------------------------------------------------|----------------------------------------------|------------------------|---------------------------------------------------------------------------|--------|--------|--------|---------|
|                                                                                  |                                              |                        | 100°                                                                      | 200°   | 300°   | 400°   | 500°    |
|                                                                                  |                                              |                        | Temperature of Pipe, Deg. Fahr. (Temperature of Surrounding Air, 75 Deg.) |        |        |        |         |
|                                                                                  |                                              |                        | 175°                                                                      | 275°   | 375°   | 475°   | 575°    |
| Heat losses per linear foot of bare pipe per hour and Efficiencies of insulation |                                              |                        |                                                                           |        |        |        |         |
| 1                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 74.0                                                                      | 183.4  | 337.4  | 555.2  | 846.2   |
|                                                                                  | Std.                                         | Efficiency %           | 69.09                                                                     | 74.04  | 77.90  | 81.43  | 84.15   |
|                                                                                  | 2                                            | "                      | 78.15                                                                     | 81.76  | 84.63  | 87.19  | 89.16   |
| 2                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 133.9                                                                     | 331.5  | 608.3  | 1003.9 | 1530.1  |
|                                                                                  | Std.                                         | Efficiency %           | 76.49                                                                     | 80.27  | 83.22  | 85.92  | 88.01   |
|                                                                                  | 2                                            | "                      | 83.41                                                                     | 86.19  | 88.36  | 90.31  | 91.77   |
| 3                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 197.3                                                                     | 488.8  | 896.8  | 1480.0 | 2255.8  |
|                                                                                  | Std.                                         | Efficiency %           | 78.70                                                                     | 82.10  | 84.75  | 87.19  | 89.09   |
|                                                                                  | 2                                            | "                      | 85.35                                                                     | 87.77  | 89.66  | 90.37  | 92.70   |
| 4                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 253.5                                                                     | 627.9  | 1152.1 | 1901.3 | 2897.09 |
|                                                                                  | Std.                                         | Efficiency %           | 80.90                                                                     | 83.99  | 86.36  | 88.55  | 90.26   |
|                                                                                  | 2                                            | "                      | 86.50                                                                     | 88.71  | 90.46  | 92.03  | 93.28   |
| 6                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 371.9                                                                     | 923.7  | 1694.9 | 2797.1 | 4265.6  |
|                                                                                  | Std.                                         | Efficiency %           | 82.24                                                                     | 85.01  | 87.26  | 89.29  | 90.87   |
|                                                                                  | 2                                            | "                      | 87.68                                                                     | 89.75  | 91.35  | 92.76  | 93.87   |
| 8                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 485.7                                                                     | 1203.0 | 2207.3 | 3642.8 | 5552.2  |
|                                                                                  | Std.                                         | Efficiency %           | 84.05                                                                     | 86.60  | 88.60  | 90.41  | 91.85   |
|                                                                                  | 2                                            | "                      | 88.39                                                                     | 90.32  | 91.81  | 93.16  | 94.19   |
| Flat<br>Surface                                                                  | 0                                            | (Bare Surface) B.t.u.  | 215.2                                                                     | 533.0  | 978.0  | 1614.0 | 2460.0  |
|                                                                                  | 1                                            | Efficiency %           | 84.16                                                                     | 86.50  | 88.37  | 90.11  | 91.46   |
|                                                                                  | 2                                            | "                      | 91.31                                                                     | 92.61  | 93.61  | 94.55  | 95.29   |
|                                                                                  | 3                                            | "                      | 94.01                                                                     | 94.90  | 95.58  | 96.23  | 96.75   |

**JOHNS-MANVILLE ASBESTO-SPONGE FELTED INSULATION**

For insulating high pressure and superheated steam lines to 700 deg. Fahr.

**EFFICIENCIES**

| Pipe Size<br>Inches                                                              | Nominal<br>Insulation<br>Thickness<br>Inches |                        | Temperature Difference Between Pipe and Surrounding Air, Deg. Fahr.       |        |        |        |         |
|----------------------------------------------------------------------------------|----------------------------------------------|------------------------|---------------------------------------------------------------------------|--------|--------|--------|---------|
|                                                                                  |                                              |                        | 100°                                                                      | 200°   | 300°   | 400°   | 500°    |
|                                                                                  |                                              |                        | Temperature of Pipe, Deg. Fahr. (Temperature of Surrounding Air, 75 Deg.) |        |        |        |         |
|                                                                                  |                                              |                        | 175°                                                                      | 275°   | 375°   | 475°   | 575°    |
| Heat losses per linear foot of bare pipe per hour and Efficiencies of insulation |                                              |                        |                                                                           |        |        |        |         |
| 1                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 74.0                                                                      | 183.4  | 337.4  | 555.2  | 846.2   |
|                                                                                  | 1                                            | Efficiency %           | 75.66                                                                     | 79.15  | 81.95  | 84.55  | 86.62   |
|                                                                                  | 2                                            | "                      | 80.23                                                                     | 83.60  | 85.84  | 87.90  | 89.53   |
| 2                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 133.9                                                                     | 331.5  | 608.3  | 1003.9 | 1530.1  |
|                                                                                  | 1                                            | Efficiency %           | 80.16                                                                     | 83.00  | 85.28  | 87.41  | 89.07   |
|                                                                                  | 2                                            | "                      | 85.09                                                                     | 87.26  | 89.02  | 90.64  | 91.90   |
| 3                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 197.3                                                                     | 488.8  | 896.8  | 1480.0 | 2255.8  |
|                                                                                  | 1                                            | Efficiency %           | 82.20                                                                     | 84.76  | 86.80  | 88.75  | 90.26   |
|                                                                                  | 2                                            | "                      | 87.00                                                                     | 88.90  | 90.40  | 91.80  | 92.90   |
| 4                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 253.5                                                                     | 627.9  | 1152.1 | 1901.3 | 2897.09 |
|                                                                                  | 1                                            | Efficiency %           | 83.24                                                                     | 85.60  | 87.55  | 89.35  | 90.75   |
|                                                                                  | 2                                            | "                      | 87.96                                                                     | 89.71  | 91.10  | 92.42  | 93.44   |
| 6                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 371.9                                                                     | 923.7  | 1694.9 | 2797.1 | 4265.6  |
|                                                                                  | 1                                            | Efficiency %           | 84.35                                                                     | 86.55  | 88.37  | 90.06  | 91.38   |
|                                                                                  | 2                                            | "                      | 89.08                                                                     | 90.66  | 91.93  | 93.14  | 94.07   |
| 8                                                                                | 0                                            | Bare Pipe Loss, B.t.u. | 485.7                                                                     | 1203.0 | 2207.3 | 3642.8 | 5552.2  |
|                                                                                  | 1                                            | Efficiency %           | 84.95                                                                     | 87.10  | 88.84  | 90.44  | 91.69   |
|                                                                                  | 2                                            | "                      | 89.64                                                                     | 91.14  | 92.36  | 93.48  | 94.35   |
| Flat<br>Surface                                                                  | 0                                            | (Bare Surface) B.t.u.  | 215.2                                                                     | 533.0  | 978.0  | 1614.0 | 2460.0  |
|                                                                                  | 1                                            | Efficiency %           | 84.16                                                                     | 86.50  | 88.37  | 90.11  | 91.46   |
|                                                                                  | 2                                            | "                      | 91.31                                                                     | 92.61  | 93.61  | 94.55  | 95.29   |
|                                                                                  | 3                                            | "                      | 94.01                                                                     | 94.90  | 95.58  | 96.23  | 96.75   |

**JOHNS-MANVILLE IMPROVED ASBESTOCEL INSULATION**

For insulating pipes conveying hot water or steam at medium and low pressure.

**EFFICIENCIES**

| Pipe<br>Sizes<br>Inches | Ply   |                        | Temperature Difference Between Pipe and Surrounding Air, Deg. Fahr.       |       |        |        |        | Heat losses per linear foot of bare pipe per hour and efficiencies of insulation |
|-------------------------|-------|------------------------|---------------------------------------------------------------------------|-------|--------|--------|--------|----------------------------------------------------------------------------------|
|                         |       |                        | 100°                                                                      | 150°  | 200°   | 250°   | 300°   |                                                                                  |
|                         |       |                        | Temperature of Pipe, Deg. Fahr. (Temperature of Surrounding Air, 75 Deg.) |       |        |        |        |                                                                                  |
|                         |       |                        | 175°                                                                      | 225°  | 275°   | 325°   | 375°   |                                                                                  |
| 1                       | 2-ply | Bare Pipe Loss, B.t.u. | 74.0                                                                      | 123.8 | 183.4  | 253.7  | 337.4  |                                                                                  |
|                         | 3-ply | Efficiency %           | 57.81                                                                     | 59.80 | 61.58  | 63.23  | 64.77  |                                                                                  |
|                         | 4-ply | "                      | 62.86                                                                     | 64.83 | 66.60  | 68.22  | 69.69  |                                                                                  |
|                         | "     | %                      | 66.35                                                                     | 68.12 | 69.72  | 71.20  | 72.58  |                                                                                  |
| 2                       | 2-ply | Bare Pipe Loss, B.t.u. | 133.9                                                                     | 223.9 | 331.5  | 458.7  | 608.3  |                                                                                  |
|                         | 3-ply | Efficiency %           | 64.49                                                                     | 66.12 | 67.58  | 68.89  | 70.10  |                                                                                  |
|                         | 4-ply | "                      | 69.71                                                                     | 71.25 | 72.64  | 73.93  | 75.12  |                                                                                  |
|                         | "     | %                      | 73.04                                                                     | 74.45 | 75.72  | 76.89  | 78.00  |                                                                                  |
| 3                       | 2-ply | Bare Pipe Loss, B.t.u. | 197.3                                                                     | 330.1 | 488.8  | 676.3  | 896.8  |                                                                                  |
|                         | 3-ply | Efficiency %           | 67.19                                                                     | 68.67 | 69.99  | 71.20  | 72.33  |                                                                                  |
|                         | 4-ply | "                      | 72.62                                                                     | 74.03 | 75.28  | 76.38  | 77.39  |                                                                                  |
|                         | "     | %                      | 75.92                                                                     | 77.17 | 78.31  | 79.37  | 80.33  |                                                                                  |
| 4                       | 2-ply | Bare Pipe Loss, B.t.u. | 253.5                                                                     | 424.2 | 627.9  | 868.8  | 1152.1 |                                                                                  |
|                         | 3-ply | Efficiency %           | 68.62                                                                     | 70.03 | 71.29  | 72.42  | 73.43  |                                                                                  |
|                         | 4-ply | "                      | 73.96                                                                     | 75.29 | 76.47  | 77.57  | 78.58  |                                                                                  |
|                         | "     | %                      | 77.41                                                                     | 78.54 | 79.58  | 80.55  | 81.47  |                                                                                  |
| 6                       | 2-ply | Bare Pipe Loss, B.t.u. | 371.9                                                                     | 623.9 | 923.7  | 1278.1 | 1694.9 |                                                                                  |
|                         | 3-ply | Efficiency %           | 70.02                                                                     | 71.38 | 72.57  | 73.68  | 74.66  |                                                                                  |
|                         | 4-ply | "                      | 75.59                                                                     | 76.83 | 77.93  | 78.96  | 79.87  |                                                                                  |
|                         | "     | %                      | 79.03                                                                     | 80.12 | 81.08  | 81.97  | 82.82  |                                                                                  |
| 8                       | 2-ply | Bare Pipe Loss, B.t.u. | 485.7                                                                     | 812.5 | 1203.0 | 1664.5 | 2207.3 |                                                                                  |
|                         | 3-ply | Efficiency %           | 70.96                                                                     | 72.20 | 73.32  | 74.35  | 75.31  |                                                                                  |
|                         | 4-ply | "                      | 76.39                                                                     | 77.58 | 78.64  | 79.63  | 80.52  |                                                                                  |
|                         | "     | %                      | 79.83                                                                     | 80.87 | 81.80  | 82.65  | 83.47  |                                                                                  |

**JOHNS-MANVILLE UNDERGROUND SYSTEM OF INSULATION**

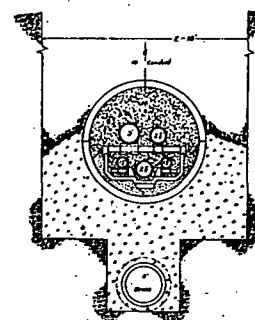
A specially salt glazed and highly vitrified tile conduit is used as a waterproof envelope to protect the insulation—Johns-Manville Asbesto-Sponge Conduit Filling, is packed around the piping to be insulated and completely fills the conduit.

The cast iron roll frame used is installed in a mortar or concrete bed and is set at the proper elevation from an overhead batter-board line. This method prevents uneven alignment of the pipes by irregularity in the manufacture of the conduit, etc.

The insulation used to surround the pipe is made of asbestos fibre and material of a sponge-like nature, which when properly mixed with the asbestos, forms the most efficient and durable insulation for underground work.

The underdrain laid with open joints carries away the water that rapidly filters away from the system through the broken stone or gravel in which the lower half of the system and the underdrain itself is laid.

Shutters for sealing the ends of the system, manhole and anchor pits are incidental but necessary, and are placed according to conditions and requirements as recommended by our engineers.



Section of Trench