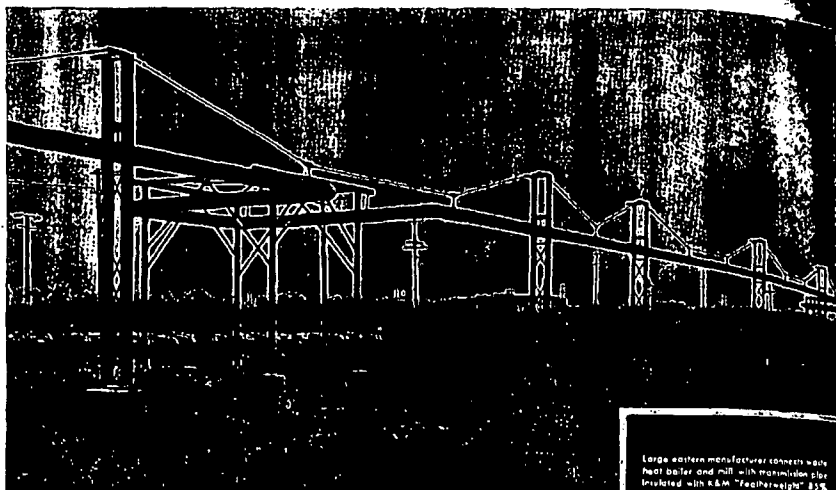




Large eastern manufacturer connects water heat boiler and mill with transmission line insulated with K&M "Featherweight" 85% Magnesia and Hy-Temp.

Superheated steam travels nearly 2 miles

Another job for K&M "Featherweight" 85% Magnesia

Here is a real job for insulation. A 16" superheated steam line almost two miles long at 275 pounds pressure and a temperature of approximately 650°F. Just another case where 85% Magnesia and Hy-Temp Insulation were selected to give maximum results under exacting circumstances.

The pipe line illustrated above presents one of those extreme conditions where insulation is called upon to minimize heat losses with seasonal temperature changes varying from zero to 90°F. In this instance a 3-ply outer covering of Asbestos Roofing Felt is used as a protection against the elements.

K&M Distributors, located strategically throughout the country, are experts on the application of K&M insulation materials. Let them help you gain substantial savings in your plant. Write for full details.

KEASBEY & MATTISON COMPANY • AMBLER, PENNSYLVANIA

IN CANADA: Atlas Asbestos Co., Ltd., MONTREAL • TORONTO • WINNIPEG and VANCOUVER

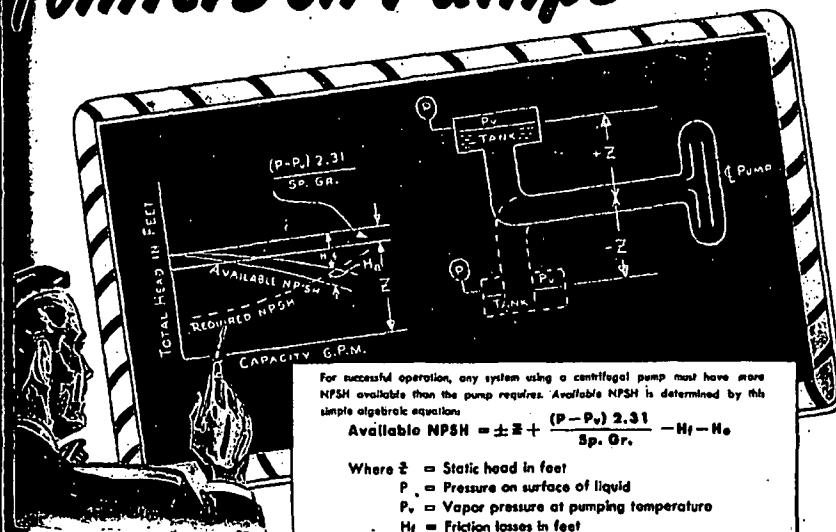
*Nature Made
Asbestos—*

*Keasbey & Mattison
has made it serve
mankind since 1873.*



POWER • Mid-June, 1948

Pointers on Pumps



For successful operation, any system using a centrifugal pump must have more NPSH available than the pump requires. Available NPSH is determined by this simple algebraic equation:

$$\text{Available NPSH} = \pm Z + \frac{(P - P_v) 2.31}{\text{Sp. Gr.}} - H_f - H_o$$

Where Z = Static head in feet

P = Pressure on surface of liquid

P_v = Vapor pressure at pumping temperature

H_f = Friction losses in feet

H_o = Entrance loss from tank to pipe

NOTE: For boiling liquids, P usually equals P_v ; this item is therefore omitted from the problem.

WHAT IS NPSH?

NPSH (net positive suction head) is an absolute term covering hydraulic conditions at the suction side of a centrifugal pump. It can be used instead of the relative terms "suction lift" and "friction head" to assure the proper application of centrifugal pumps. These relative terms are useful in calculating the total head against which the pump must operate; but they should not be used when considering the suction condition as it affects proper centrifugal pump selection.

Actually, every centrifugal pump has its own NPSH characteristic, usually referred to as "required NPSH". The pump impeller opening must be filled at the required rate of flow (GPM) so the impeller can pump at this rate. The

velocity needed to put this quantity into the impeller opening must come from an external head. The value of this external head is the "required NPSH".

Obviously, if the liquid pumped is not to vaporize in the entrance to the impeller, the required NPSH must be measured over and above the vapor pressure of the liquid at the pumping temperature. The required NPSH will vary roughly as the square of the pump capacity through the useful range of application of that pump.

For YOUR Pumping Needs

Worthington has the most complete line of centrifugal pumps—all pressures, all capacities—and engineers ready to give you expert advice on any pumping problem. For further details proving there's more worth in Worthington, contact our nearest District Office, or write to Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.

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