

Cavitation

Cavitation is a result of inadequate Net Positive Head Available (NPSHA). When the total energy (pressure head and velocity) in the fluid, expressed in head or equivalent pressure, is equal to or less than the vapor pressure of the fluid, vapor is formed and moves with the liquid flow. The vapor bubbles or “cavities” collapse when they reach regions of higher pressure in the pump. The violent collapse of vapor bubbles forces liquid at high velocity against the metal, producing pressures of high intensity. The pressures can exceed the compressive strength of the metal, and actually blast out particles, giving the metal a pitted appearance.

For liquid overfeed or transfer pump applications the pitted signature is not typically evident. The vapor volume of ammonia is substantially lower than that of water. As a result, the available transfer of energy, which occurs during the collapse of the vapor bubbles, is typically not sufficient to create pressures capable of exceeding the compressive strength of the metals used in Cornell’s refrigeration product group.

The major effects of cavitation typically associated with liquid overfeed or transfer pump applications are drops in pressure differential, capacity and hydraulic efficiency.