



# TECH BULLETIN

002  
12/76

*Published regarding engineering changes and improvements*

## SUBJECT: Inlet Pressure VS Liquid Temperature

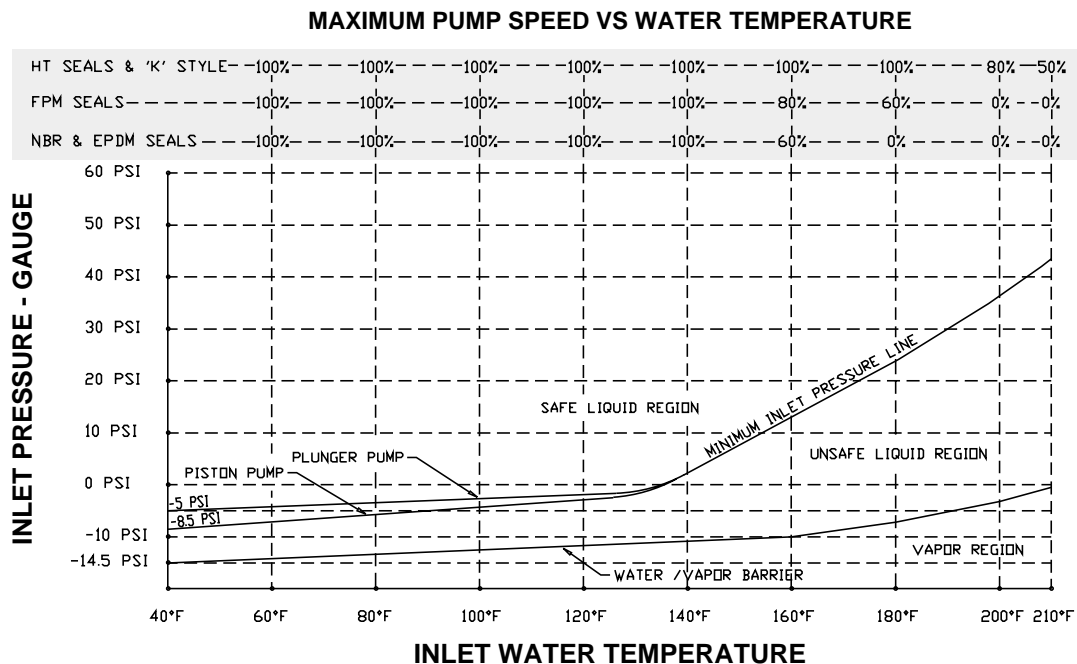
As the temperature of the pumped liquid increases, the likelihood of vaporization and cavitation increases. Several aspects of the system should be considered with elevated temperatures to achieve optimum performance.

- pressurize inlet above 130°F
- reduce pump RPM
- install C.A.T. in inlet line
- increase inlet line size to the pump
- properly sized and baffled supply tank

### PRESSURIZED INLET

With ambient liquids the **piston pumps** can handle a negative suction of up to 8.5 PSI (20 feet of water) and the **plunger pumps** can handle a negative suction up to 5 PSI (11.5 feet of water). As the temperature of the liquid increases, the vapor pressure (pressure required to remain liquid) also increases. By increasing the inlet pressure to the pump, you can minimize the increased risk of cavitation.

To achieve the recommended inlet pressures with elevated temperatures, it is often necessary to use a booster pump. The booster pump should be approximately twice the system capacity to assure adequate flow into the pump. See chart below.



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## C.A.T.

The optimum installation for ambient temperature liquids is with a properly sized baffled supply tank. It should be enclosed and 6-10 times the system capacity with at least two baffles. If more than 5-6 feet from the pump or long feed lines or a booster pump or high temperature liquids are present, the C.A.T. (captive acceleration tube) should be installed to stabilize inlet pressure. **Note:** The C.A.T. will not function with a negative suction inlet.

## REDUCTION IN RPM

In addition to increasing the inlet pressure to the pump as temperature increases, reducing the pump RPM will also offer added protection. Reducing the RPM reduces the acceleration of the liquid and the vaporization of the liquid. Lower RPM reduces the risk of cavitation and its damaging effects. See chart on front for recommended RPM.

## INCREASED LINE SIZE

It is always important to have the inlet supply line sized to match or be one size larger than the pump inlet port for optimum performance, but it is most critical when the pumped liquid is at elevated temperatures. Under sizing the line will only compound the problems of high temperature vaporization. See individual Pump Data Sheet.

## CAT PUMPS

Technical Services Department