CHEMPUMP
A DIVISION OF TEIKOKU USA INC.

ENGINEERING DATA SHEET

Net Positive Suction Head		
Date	**Supersedes**	**No.**
04/01/99	**06/01/66**	**7E**

Net positive suction head available ($NPSH_A$) of a system is the absolute pressure available at pump suction (in feet) minus the vapor pressure of the liquid at pumping temperature (in feet). $NPSH_A$ must be taken in to consideration at all times when selecting the proper pump. One must determine $NPSH_A$ of system and then compare this with minimum $NPSH_R$ required by the pump. If system $NPSH_A$ is greater than minimum required by the pump, the pump will operate properly. However, if system $NPSH_A$ is only slightly greater, equal to, or less than minimum pump requirement, pump should not be used without suction head being increased, or suction lift decreased to provide a reasonable factor of safety. Inducers are available on most Chempumps to reduce the $NPSH_R$ of the pump. The following formula is used to determine the $NPSH_A$ of a system:

$$NPSH = Ha \pm Hs - Hvp$$

Where Ha = Absolute ambient pressure (psia) above liquid at the source of supply, expressed in feet (psia x 2.31).

Hs = Dynamic head of liquid above (+) or below (-) centerline of pump suction. All losses (friction, exit velocity, etc.) must be figured in determining Hs.

Hvp = Vapor pressure (in feet) of liquid being pumped at pumping temperature.

In the example shown on sheet 6E:

Ha	=	30" - 22"	=	8" Hg absolute pressure.
	=	8" x 1.13	=	9.04 feet.
Hs	=	Static head - friction losses.		
	=	20 - (1.9 + .3)	=	17.8 feet.
Hvp	=	8.57 feet.		
NPSH	=	9.04 + 17.8 - 8.57.		
	=	18.27 feet	=	head available at pump suction at a flow rate of 60 GPM.

Minimum Net Positive Suction Head (MNPSH) is the net head (absolute) required at the entrance or eye of the impeller to move and accelerate the liquid entering the eye. This minimum is required so that the pump will not pull a vacuum and cause liquid vaporization with resultant cavitation at the impeller.

MNPSH is a characteristic of the pump itself. The representative MNPSH or NPSH required curve for each Chempump model is shown on the performance curves (See EDS 3E).