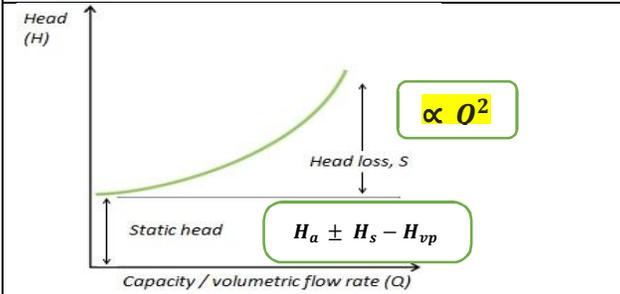


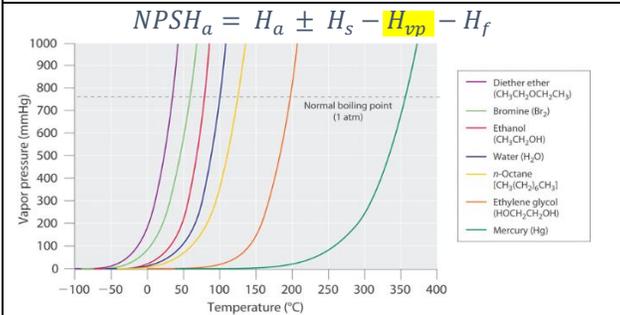
NPSH and Cavitation – Common lapses

NPSH available is not a constant value given in the datasheet



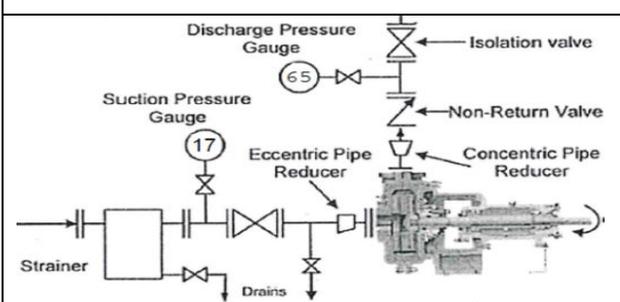
- Suction head or NPSH available consists of static head and dynamic head.
- Dynamic head or head loss across the suction systems (piping, valves, elbows, expander / reducer etc) is vary in square of the flow.
- Head loss across the system at 10% and 20% higher flow would increase by 21% and 44% respectively.
- If nature of product (viscosity or density) changed, it affects affect the friction factor and resultant head loss. That could be negligible.

Actual NPSH available value vary with operating temperature



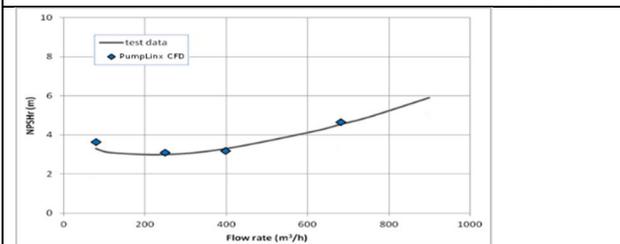
- Vapor pressure being considered in the data sheet is at certain operating temperature.
- If actual operating temperature is higher, vapor pressure would also increase and that would lead to low NPSH available than anticipated.
- It is very important point, while handling light HC or product at sub-zero temperature. Suction temperature at source could be normal but while it reaches to pump casing sometimes it may increase by few degree C if suction system is not properly insulated.

Suction strainer is friend of pump, but not the always.



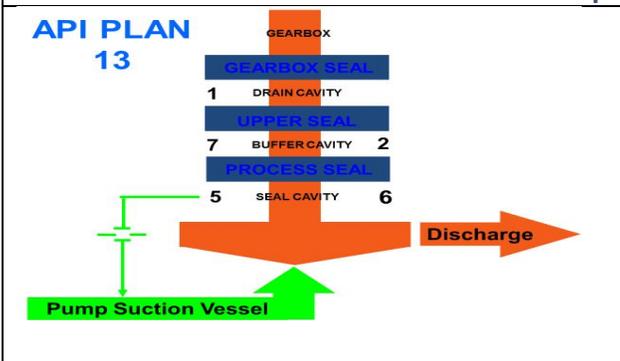
- Suction strainer is a good friend of pump, protect from solid, lump and foreign material. However, if not handled properly and maintained its condition, it may prove worst enemy.
- In the above NPSHa formula, suction strainer loss is either not considered or assumed to be very low whereas while fine mesh get choked Diff. pressure across the strainer goes very high.
- Sometimes pressure gauge is not installed in between the strainer and pump so not possible to know the strainer condition without opening it.

Datasheet NPSHr is not only an absolute value



- NPSHr value given in the data sheet is at rated condition.
- It increases with increase in operating flow.
- NPSH also increase on extreme left side to BEP, close the Minimum continuous flow region. Internal recirculation at impeller suction would generate excessive heat and may cavitate the pump.

Pump Start up venting matters



- Proper venting of centrifugal pump is essential while handling HC at cryonic temperature.
- It is not all about the open casing or seal vent line for some time and close it. It is to ensure no vapor or gas hold up inside the casing or mechanical seal cavity.
- While pump is on standby with suction valve open, there is a possibility of huge amount of HC hold up in suction piping, casing and seal cavity. Venting may be required for extended time than normal practice.
- If piping and pumps are not insulated and ambient temperature is high, situation may get worse while change over. Continues venting, Plan 13M may help to improve the situation.