CONSIDER SUCTION ACCELERATION HEAD ("A.H.") LOSSES, + HOW MUCH DISCHARGE "A.H." YOUR SYSTEM WILL GENERATE.

ESTIMATE, HOW SMOOTH WILL IT BE, WITH NO DAMPERS AT ALL.

Before specifying a smoother system, you may wish to estimate how much improvement you need from the system as it will be. The calculation below is a rule of thumb that covers pressure pulsation generated to overcome system resistance to pump flow fluctuation only

EXPLANATION

Pressure pulsation generated by a system resisting flow fluctuation from your pump mostly depends on the mass of your liquid that has to follow the variations in velocity from your pump, the "flow fluctuations". This need to create head, or pressure, is often referred to as system "mass acceleration head". Flow "friction" also plays a part (see friction page) depending on system pipe size choice. To "visualise" what has to happen, first establish the weight of your liquid that has to fluctuate. Then consider the speed at which you intend to run your pump. The mass and time available for velocity change is where your system generates the pressure pulsation excitation. How much this is dissipated or amplified by the characteristics of your piping design, controls how much pulsation your system will cause.

Necessary Information to estimate acceleration head Pulsation.

SG	Specific Gravity - Grams per Cubic Centimeter gm/"cc" gm/cm3 Conversion from Lbs/Ft3, divide by 63
L	Length of pipe in feet, Ft.
Q	Volumetric flow rate, in US Gallons per hour. Consider 1 US Gallon to equal 3.8 Litres
N	Number of displacements per minute. RPM x Number of displacers per rev.
ID	Average Internal Diameter of the pipe that is full of the liquid.
Z	A figure of relative decrease in "pulsatiousness" by number of displacers - examples are crank driven plungers .

NOTE:
SG, L & ID are nothing to do with the pump

RELATIONSHIP

$$\frac{SG \times L \times Q \times N}{27700 \times (ID^2) \times Z} =$$

Addition to system pressure, peaks from acceleration head.
or on a suction supply system :
the pressure loss that will prevent the pump from filling.

CONTINUED

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