ADD FRICTION from system flow resistance TO "A.H." figure

Also known as "Viscous drag" "Scrubbing action" "Rotary flow" "Reynolds effect".

1. INPUT DATA

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Units	Variable	Example	Description
GPM Steady state	Q gpm :=	41	Volumetric flow rate
mm	D :=	38	Inside diam of the pipe
m^2/sec	v :=	$1{,}9 \times 10^{-6}$	Kinematic viscosity
m	L :=	218	Length of the pipe
kg/m^3	p :=	980	Density (SG, [Where 1Gram is 1ml SG=1] Specific Gravity x 1000)

Approximation cP "centiPoise" to m^2/sec, multiply by 1 million (for water)

Pipe Fitting Component	Fittings
Round the corner of a Tee	T1 := 1
Past a side opening of a Tee	T2 := 3
Back into line from a side opening in a Tee	T3 := 1
Rounded corner 90° elbow (Long Rad. or L.R. 90)	E1 := 2
Abrupt 90° elbow ("Hard" 90 or Machined "L")	E2 := 9
Gentle 45° elbow (Bends & or "5D" 90)	E3 := 2

Estimating : dP @ peak of Flow Fluctuations

To find the increase in pulsation from flow fluctuation, assume max. fluctuation from simplex pump is 3.25 x steady state Q. Divide 3.25 Q by "F" nbr. for your pump type. Add the result to your steady state Q Run the formula with your increased Q Deduct steady state dP from this new dP The difference is pulsation dP.

Effective Length of Pipe System

$$L_{eff} := L+(0.0667xDxT1)+(0.0209xDxT2)+(0.0667xDxT3)+(0.0327xDxE1)+(0.0681xDxE2)+(0.0144xDxE3)$$

figures applied for E and T are averages from tests

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