

## Fluid Formulas

FORMULA FOR:	WORD FORMULA:	LETTER FORMULA:
VELOCITY THROUGH PIPING In Feet/Second Velocity	Velocity = $\frac{.3208 \times \text{Flow Rate through I.D. (GPM)}}{\text{Internal Area (Square Inches)}}$	$V = .3208Q/A$
COMPRESSIBILITY OF OIL In Additional Required Oil to Reach Pressure	Additional Volume = $\frac{\text{Pressure (psi)} \times \text{Volume of Oil under Pressure}}{250,000 \text{ (approx.)}}$	$V_A = PV/250,000 \text{ (approx.)}$
COMPRESSIBILITY OF A FLUID	Compressibility = $\frac{1}{\text{Bulk Modulus of the Fluid}}$	$C(\beta) = 1/BM$
SPECIFIC GRAVITY OF A FLUID	Specific Gravity = $\frac{\text{Weight of One Cubic Foot of Fluid}}{\text{Weight of One Cubic Foot of Water}}$	$SG = W/62.4283$
VALVE (Cv) FLOW FACTOR	Valve Factor = $\frac{\text{Flow Rate (GPM)} \sqrt{\text{Specific Gravity}}}{\sqrt{\text{Pressure Drop (psi)}}$	$C_v = (Q\sqrt{SG})/(\sqrt{\Delta p})$
VISCOSITY IN CENTISTOKES	For Viscosities of 32 to 100 Saybolt Universal Seconds:  Centistokes = $.2253 \times \text{SUS} - \left( \frac{194.4}{\text{SUS}} \right)$	$CS = .2253 \text{ SUS} - (194.4/\text{SUS})$
	For Viscosities of 100 to 240 Saybolt Universal Seconds:  Centistokes = $.2193 \times \text{SUS} - \left( \frac{134.6}{\text{SUS}} \right)$	$CS = .2193 \text{ SUS} - (134.6/\text{SUS})$
	For Viscosities greater than 240 Saybolt Universal Seconds:  Centistokes = $\left( \frac{\text{SUS}}{4.635} \right)$	$CS = \text{SUS}/4.635$

**Note:** Saybolt Universal Seconds can also be abbreviated as SSU.