Dimensional Analysis Equations

Bernoulli and Navier Stokes Equations | Control Volume Equations | Dimensional Analysis Equations | Equations | Flocculation Equations
Flow Measurement Equations | Open Channel Flow Equations | Pipe Flow Equations | Process Controller equations | Sedimentation Equations
Statics Equations | Using Confluence - Tips and Tricks

Inertia

$$f_i = \rho \frac{V^2}{l}$$ specifc force inertia

Compressibility

$$f_{E_v} = \frac{E_v}{l}$$ specific force compressibility

$$M = \frac{V}{c}$$ Mach

Drag

$$f_{drag} = \frac{Drag}{l^3}$$ specific force drag

$$C_d = \frac{2\mathrm{Drag}}{\rho V^2 A}$$ Drag coefficient

Gravity

$$f_g = \rho g$$ specific force gravity

$$\mathrm{Fr} = \frac{V}{\sqrt{gl}}$$ Froude

Pressure

$$f_{\Delta p} = \frac{\Delta p}{l}$$ specific force pressure

$$C_p = \frac{-2(\Delta p + \rho g \Delta z)}{\rho V^2}$$ Pressure coefficient

Surface Tension

$$f_\sigma = \frac{\sigma}{l^2}$$ specific force surface tension

$$W = \frac{V^2 l \rho}{\sigma}$$ Weber

Viscosity

$$f_\mu = \mu \frac{V}{l^2}$$ specific force viscosity

$$\mathrm{Re} = \frac{\rho V l}{\mu}$$ Reynolds number generic

$$\mathrm{Re} = \frac{4Q}{\pi D \nu}$$ Re(Q)

$$\nu = \frac{\mu}{\rho}$$ kinematic and dynamic viscosity

Minimum Diameter for Laminar Flow

$$D = \frac{4Q_{\max}}{\pi \nu \mathrm{Re}_{\max}}$$ Minimum Diameter for Laminar Flow