

ENGINEER'S FORMULA REFERENCE

ABBREVIATIONS

FL= Friction loss

EP= Engine pressure

C=Friction loss coefficient

PDP= Pump discharge pressure

Q= Flow rate in hundreds of gallons

ROT= Rule of thumb

L= Hose length in hundreds of feet

d= Diameter

NP= Nozzle pressure

GPM= Gallons per minute

APL= Appliance friction loss

NR= Nozzle reaction

EL= Elevation Loss

Volume= Parallel, Pressure = Series

FORMULAS

$$FL/100' = CQ^2L$$

$$\text{Solid stream NR} = 1.57 \times d^2 \times NP$$

$$GPM = 29.7 \times d^2 \times \sqrt{NP}$$

$$\text{Fog NR} = 0.0505 \times Q \times \sqrt{NP}$$

$$L = \text{Hose length}/100$$

COEFFICIENTS or C

$$1 \frac{3}{4}'' = 15.5$$

$$2'' = 7$$

$$2 \frac{1}{2}'' = 2$$

$$\text{Lightweight } 2 \frac{1}{2}'' = 1.75$$

$$3'' = .8$$

$$5'' = .08$$

Example:

300' of 1 3/4" hose with a 185 GPM nozzle

$$C = 15.5 \quad Q = 1.85 \quad L = 3$$

$$FL = CQ^2L$$

$$159 = (15.5) \times (1.85)^2 \times 3$$