

Conversions & Equations

Flow rate

$$Q = K (PSI)^x$$

$$\left(\frac{Q_2}{Q_1}\right) = \sqrt{\frac{SG_1}{SG_2}}$$

$$PSI = \left(\frac{Q}{K}\right)^{1/x}$$

Vessel with internal pressure:

$$\left(\frac{Q_2}{Q_1}\right) = \left(\frac{PSI_2}{PSI_1}\right)^x$$

$$GPM = K (PSI_{inlet} - PSII_{Vessel})^x$$

| Nozzle Series | Exponent x | Nozzle Series | Exponent x |
|---------------|------------|---------------|------------|
| BJ | 0.50 | PJ | 0.50 |
| CW | 0.47 | PSR | 0.50 |
| FF | 0.50 | SC | 0.47 |
| IS | 0.50 | SPN | 0.50 |
| L | 0.50 | ST | 0.50 |
| LEM | 0.50 | STXP | 0.50 |
| LP | 0.50 | TC | 0.46 |
| MaxiPass | 0.47 | TD/TDL | 0.50 |
| MicroWhirl | 0.50 | TF | 0.50 |
| N | 0.50 | TFXP | 0.50 |
| NC | 0.47 | TH, THW | 0.50 |
| NCJ | 0.47 | TW | 0.50 |
| NCK | 0.47 | WL | 0.47 |
| NCS | 0.47 | WT | 0.50 |
| NF | 0.50 | WTX | 0.50 |
| P | 0.50 | WTZ | 0.50 |

Dropsizes

System Design

$$\left(\frac{D_2}{D_1}\right) = \left(\frac{P_2}{P_1}\right)^{0.3}$$

$$PSI_{Pump} = PSI_{Nozzle} + PSI_{Pipe Losses} + \frac{\rho h}{144}$$

| Conversion Data | | |
|-------------------------|----------------|---------------------|
| MULTIPLY | BY | TO OBTAIN |
| atmospheres | 1.013 | bar |
| atmospheres | 33.931 | feet of water |
| atmospheres | 1.0332 | kg/cm ² |
| atmospheres | 101.3 | kiloPascals (kPa) |
| atmospheres | 14.696 | psi |
| bar | 100 | kPa |
| bar | 14.5 | psi |
| barrels (oil) | 42 | gallons |
| centimeters | 0.3937 | inches |
| centiStokes | Sp. gravity | centiPoise |
| cm ³ | 0.061 | in ³ |
| cm ³ | 0.000264 | gallons |
| cm ³ | 0.001 | liters |
| ft ³ | 1728 | inches |
| ft ³ | 0.02832 | m ³ |
| ft ³ | 7.48 | gallons |
| ft ³ | 28.32 | liters |
| ft ³ (water) | 62.43 | pounds (water) |
| in ³ | 16.39 | cm ³ |
| in ³ | 0.00433 | gallons |
| in ³ | 0.164 | liters |
| m ³ | 35.31 | ft ³ |
| m ³ | 61.024 | in ³ |
| m ³ | 264.2 | gallons |
| m ³ | 1000 | liters |
| degree (angle) | 60 | minutes |
| degree (Celsius) | (°C x 1.8) +32 | degree (Fahrenheit) |
| degree (Fahrenheit) | (°F-32) x 0.56 | degree (Celsius) |
| feet | 0.3048 | meters |
| feet/sec | 30.48 | centimeters/sec |

| Conversion Data | | |
|--------------------|---------|-----------------------|
| MULTIPLY | BY | TO OBTAIN |
| feet/sec | 18.29 | meters/min |
| feet of water | 0.0295 | atmospheres |
| feet of water | 0.884 | inches of mercury |
| feet of water | 0.433 | psi |
| gallons | 3785 | cm ³ |
| gallons | 0.1337 | ft ³ |
| gallons | 0.83267 | imperial gallons |
| gallons | 3.785 | liters |
| gallons/min | 0.06309 | liters/sec |
| imperial gallons | 1.2 | gallons |
| horsepower | 1.014 | horsepower (metric) |
| horsepower | 33.000 | foot pounds/min |
| horsepower | 746 | Watts |
| inches | 2.54 | centimeters |
| kg/cm ² | 14.22 | psi |
| kiloWatts | 1.340 | horsepower |
| liters | 1000 | cm ³ |
| liters | 0.264 | gallons |
| liters | 0.22 | imperial gallons |
| liters | 33.8 | ounces (fluid) |
| meters | 3.281 | feet |
| microns (μm) | 0.0394 | thousandth of an inch |
| miles/hr | 44.7 | centimeters/sec |
| miles/hr | 1.467 | feet/sec |
| millimeters | 0.0394 | inches |
| psi | 0.068 | atmospheres |
| psi | 0.06895 | bar |
| psi | 2.307 | feet of water |
| psi | 0.0703 | kg/cm ² |
| psi | 6.895 | kPa |

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