

Important Parshall Flume Formulas PDF



Formulas
Examples
with Units

List of 8
Important Parshall Flume Formulas

1) Depth of Flow in Parshall Flume given Discharge Coefficient 1.5 Formula

Formula

$$H_a = \left(\frac{Q_e}{1.5} \right)^{\frac{1}{n_p}}$$

Example with Units

$$7.7626 \text{ m} = \left(\frac{39.82 \text{ m}^3/\text{s}}{1.5} \right)^{\frac{1}{1.6}}$$

Evaluate Formula

2) Depth of Flow in Upstream Leg of Flume at One Third Point given Discharge Formula

Formula

$$d_f = \left(\frac{Q_e}{2.264 \cdot W_t} \right)^{\frac{2}{3}}$$

Example with Units

$$3.2514 \text{ m} = \left(\frac{39.82 \text{ m}^3/\text{s}}{2.264 \cdot 3 \text{ m}} \right)^{\frac{2}{3}}$$

Evaluate Formula

3) Depth of Parshall Flume given Discharge Formula

Formula

$$d_f = \left(\frac{Q_e}{c} \right)^{\frac{1}{n_p}}$$

Example with Units

$$2.9908 \text{ m} = \left(\frac{39.82 \text{ m}^3/\text{s}}{6.9} \right)^{\frac{1}{1.6}}$$

Evaluate Formula

4) Depth of Parshall Flume given Width Formula

Formula

$$d_{pf} = (c \cdot w)^{\frac{1}{c_b - 1}}$$

Example with Units

$$0.0496 \text{ m} = (6.9 \cdot 1.299 \text{ m})^{\frac{1}{0.27 - 1}}$$

Evaluate Formula

5) Discharge Passing through Parshall Flume Formula

Formula

$$Q_e = \left(2.264 \cdot W_t \cdot (d_f)^{\frac{3}{2}} \right)$$

Example with Units

$$40.7163 \text{ m}^3/\text{s} = \left(2.264 \cdot 3 \text{ m} \cdot (3.3 \text{ m})^{\frac{3}{2}} \right)$$

Evaluate Formula



6) Width of Parshall Flume given Depth Formula

Formula

$$w_p = \frac{(d)^{c_D - 1}}{c}$$

Example with Units

$$0.0523 \text{ m} = \frac{(4.04 \text{ m})^{0.27 - 1}}{6.9}$$

Evaluate Formula 

7) Width of Parshall Flume given Depth of Parshall Flume Formula

Formula

$$w = \sqrt{\frac{d}{c}}$$

Example with Units

$$0.7652 \text{ m} = \sqrt{\frac{4.04 \text{ m}}{6.9}}$$

Evaluate Formula 

8) Width of Throat given Discharge Formula

Formula

$$W_t = \frac{Q_e}{2.264 \cdot (d_f)^{\frac{3}{2}}}$$

Example with Units

$$2.934 \text{ m} = \frac{39.82 \text{ m}^3/\text{s}}{2.264 \cdot (3.3 \text{ m})^{\frac{3}{2}}}$$



Evaluate Formula 



Variables used in list of Parshall Flume Formulas above

- **c** Integration Constant
- **C_D** Discharge Coefficient
- **d** Depth (Meter)
- **d_f** Depth of Flow (Meter)
- **d_{pf}** Depth of Parshall Flume given Width (Meter)
- **H_a** Depth of Flow in Parshall Flume (Meter)
- **n_p** Constant for a 6-inch Parshall flume
- **Q_e** Environmental Discharge (Cubic Meter per Second)
- **w** Width (Meter)
- **w_p** Width of Parshall Flume given Depth (Meter)
- **W_t** Width of Throat (Meter)

Constants, Functions, Measurements used in list of Parshall Flume Formulas above

- **Functions:** **sqrt**, **sqrt(Number)**
A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- **Measurement:** **Length** in Meter (m)
Length Unit Conversion 
- **Measurement:** **Volumetric Flow Rate** in Cubic Meter per Second (m³/s)
Volumetric Flow Rate Unit Conversion 



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