

Important Sedimentation Tank Formulas PDF



Formulas Examples with Units

List of 17 Important Sedimentation Tank Formulas

1) Area of Sedimentation Tank Formulas ↻

1.1) Area of Tank for Discharge Rate with respect to Settling Velocity Formula ↻

Formula

$$A_{\text{mm}} = \frac{Q_e}{864000 \cdot V_s}$$

Example with Units

$$30.8642 \text{ mm}^2 = \frac{40 \text{ m}^3/\text{s}}{864000 \cdot 1.5 \text{ m/s}}$$

Evaluate Formula ↻

1.2) Area of Tank given Height at Outlet Zone with respect to Area of Tank Formula ↻

Formula

$$A = Q \cdot \frac{H}{h \cdot v}$$

Example with Units

$$50 \text{ m}^2 = 1.5 \text{ m}^3/\text{s} \cdot \frac{40 \text{ m}}{12000 \text{ mm} \cdot 0.1 \text{ m/s}}$$

Evaluate Formula ↻

1.3) Area of Tank given Vertical Falling Speed in Sedimentation Tank with respect to Area Formula ↻

Formula

$$A = \frac{Q_e}{V_s}$$

Example with Units

$$26.6667 \text{ m}^2 = \frac{40 \text{ m}^3/\text{s}}{1.5 \text{ m/s}}$$

Evaluate Formula ↻

1.4) Cross-Sectional Area given Surface Area with respect to Darcy Weishbach Friction Factor Formula ↻

Formula

$$A_{\text{cs}} = A \cdot \sqrt{\frac{f}{8}}$$

Example with Units

$$12.5 \text{ m}^2 = 50 \text{ m}^2 \cdot \sqrt{\frac{0.5}{8}}$$

Evaluate Formula ↻

1.5) Cross-Sectional Area of Sedimentation Tank Formula ↻

Formula

$$A = w \cdot h$$

Example with Units

$$27.48 \text{ m}^2 = 2.29 \text{ m} \cdot 12000 \text{ mm}$$

Evaluate Formula ↻



1.6) Cross-Sectional Area with respect to Surface Area for Practical Purpose Formula

Formula

$$A_{cs} = \frac{A}{10}$$

Example with Units

$$5 \text{ m}^2 = \frac{50 \text{ m}^2}{10}$$

Evaluate Formula 

2) Length of Sedimentation Tank Formulas

2.1) Length of Sedimentation Tank with respect to Darcy Weishbach Friction Factor Formula

Formula

$$L_S = h \cdot \sqrt{\frac{8}{f}}$$

Example with Units

$$48 \text{ m} = 12000 \text{ mm} \cdot \sqrt{\frac{8}{0.5}}$$

Evaluate Formula 

2.2) Length of Sedimentation Tank with respect to Height of Settling Zone for Practical Purpose Formula

Formula

$$L_S = 10 \cdot h$$

Example with Units

$$120 \text{ m} = 10 \cdot 12000 \text{ mm}$$

Evaluate Formula 

2.3) Length of Sedimentation Tank with respect to Surface Area Formula

Formula

$$L_S = h \cdot \frac{A}{A_{cs}}$$

Example with Units

$$46.1538 \text{ m} = 12000 \text{ mm} \cdot \frac{50 \text{ m}^2}{13 \text{ m}^2}$$

Evaluate Formula 

3) Surface Area of Sedimentation Tank Formulas

3.1) Surface Area given Length of Sedimentation Tank with respect to Surface Area Formula

Formula

$$A = L_S \cdot \frac{A_{cs}}{h}$$

Example with Units

$$48.75 \text{ m}^2 = 45 \text{ m} \cdot \frac{13 \text{ m}^2}{12000 \text{ mm}}$$

Evaluate Formula 

3.2) Surface Area of Sedimentation Tank Formula

Formula

$$A = w \cdot L_S$$

Example with Units

$$103.05 \text{ m}^2 = 2.29 \text{ m} \cdot 45 \text{ m}$$

Evaluate Formula 

3.3) Surface Area with respect to Darcy Weishbach Friction Factor Formula

Formula

$$A = A_{cs} \cdot \sqrt{\frac{8}{f}}$$

Example with Units

$$52 \text{ m}^2 = 13 \text{ m}^2 \cdot \sqrt{\frac{8}{0.5}}$$

Evaluate Formula 



3.4) Surface Area with respect to Cross-section Area for Practical Purpose Formula

Formula

$$A = 10 \cdot A_{cs}$$

Example with Units

$$130\text{m}^2 = 10 \cdot 13\text{m}^2$$

Evaluate Formula 

3.5) Surface Area with respect to Settling Velocity Formula

Formula

$$A = A_{cs} \cdot \frac{v'}{V_s}$$

Example with Units

$$0.8667\text{m}^2 = 13\text{m}^2 \cdot \frac{0.1\text{m/s}}{1.5\text{m/s}}$$

Evaluate Formula 

4) Temperature in Sedimentation Tank Formulas

4.1) Temperature in Degree Celsius given Settling Velocity Formula

Formula

$$t = \frac{\left(\frac{v_s \cdot 100}{418 \cdot (G_s - G_w) \cdot d^2} \right) - 70}{3}$$

Example with Units

$$-252.0466^\circ\text{C} = \frac{\left(\frac{0.0016\text{m/s} \cdot 100}{418 \cdot (2.7 - 1.001) \cdot 0.0013\text{m}^2} \right) - 70}{3}$$

Evaluate Formula 

4.2) Temperature in Fahrenheit given Settling Velocity Formula

Formula

$$T_F = \left(\frac{v_s \cdot 60}{418 \cdot d^2 \cdot (G_s - G_w)} \right) - 10$$

Example with Units

$$69.9862^\circ\text{F} = \left(\frac{0.0016\text{m/s} \cdot 60}{418 \cdot 0.0013\text{m}^2 \cdot (2.7 - 1.001)} \right) - 10$$

Evaluate Formula 

4.3) Temperature in Fahrenheit given Settling Velocity and Diameter greater than 0.1mm Formula

Formula

$$T_F = \frac{v_s \cdot 60}{418 \cdot d \cdot (G_s - G_w)} + 10$$

Example with Units

$$10.104^\circ\text{F} = \frac{0.0016\text{m/s} \cdot 60}{418 \cdot 0.0013\text{m} \cdot (2.7 - 1.001)} + 10$$

Evaluate Formula 



Variables used in list of Sedimentation Tank Formulas above

- **A** Area (Square Meter)
- **A_{CS}** Cross-Sectional Area (Square Meter)
- **A_{mm}** Tank Area (Square Millimeter)
- **d** Diameter of a Spherical Particle (Meter)
- **f** Darcy Friction Factor
- **G_s** Specific Gravity of Spherical Particle
- **G_w** Specific Gravity of Fluid
- **h** Height of Crack (Millimeter)
- **H** Outer Height (Meter)
- **L_S** Length of Sedimentation Tank (Meter)
- **Q** Discharge (Cubic Meter per Second)
- **Q_e** Environmental Discharge (Cubic Meter per Second)
- **t** Temperature in Centigrade (Celsius)
- **T_F** Temperature in Fahrenheit (Fahrenheit)
- **v_s** Settling Velocity of Particles (Meter per Second)
- **V_s** Settling Velocity (Meter per Second)
- **v'** Falling Speed (Meter per Second)
- **w** Width (Meter)

Constants, Functions, Measurements used in list of Sedimentation Tank 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), Millimeter (mm)
Length Unit Conversion 
- **Measurement:** **Temperature** in Celsius (°C), Fahrenheit (°F)
Temperature Unit Conversion 
- **Measurement:** **Area** in Square Millimeter (mm²), Square Meter (m²)
Area Unit Conversion 
- **Measurement:** **Speed** in Meter per Second (m/s)
Speed Unit Conversion 
- **Measurement:** **Volumetric Flow Rate** in Cubic Meter per Second (m³/s)
Volumetric Flow Rate Unit Conversion 



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