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Sedimentation Tank Formulas

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List of 17 Sedimentation Tank Formulas

Sedimentation Tank

Area of Sedimentation Tank

1) Area of Tank for Discharge Rate with respect to Settling Velocity

Open Calculator

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

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

2) Area of Tank given Height at Outlet Zone with respect to Area of Tank

Open Calculator

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

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

3) Area of Tank given Vertical Falling Speed in Sedimentation Tank with respect to Area

Open Calculator

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

ex $$26.66667\text{m}^2 = \frac{40\text{m}^3/\text{s}}{1.5\text{m/s}}$$

4) Cross-Sectional Area given Surface Area with respect to Darcy Weishbach Friction Factor

Open Calculator

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

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

5) Cross-Sectional Area of Sedimentation Tank

Open Calculator

fx $$A = w \cdot h$$

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

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

Open Calculator

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

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

Length of Sedimentation Tank

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

Open Calculator

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

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

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

Open Calculator

fx $$L_S = 10 \cdot h$$

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

9) Length of Sedimentation Tank with respect to Surface Area

Open Calculator

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

ex $$46.15385\text{m} = 12000\text{mm} \cdot \frac{50\text{m}^2}{13\text{m}^2}$$

Surface Area of Sedimentation Tank

10) Surface Area given Length of Sedimentation Tank with respect to Surface Area

Open Calculator

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

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

11) Surface Area of Sedimentation Tank

Open Calculator

fx $$A = w \cdot L_S$$

ex $$103.05m^2 = 2.29m \cdot 45m$$

12) Surface Area with respect to Darcy Weishbach Friction Factor

Open Calculator

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

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

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

Open Calculator

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

ex $$130m^2 = 10 \cdot 13m^2$$

14) Surface Area with respect to Settling Velocity

Open Calculator

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

ex $$0.866667\text{m}^2 = 13\text{m}^2 \cdot \frac{0.1\text{m/s}}{1.5\text{m/s}}$$

Temperature in Sedimentation Tank

15) Temperature in Degree Celsius given Settling Velocity

Open Calculator

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

ex $$-252.046576^\circ\text{C} = \frac{\left(\frac{0.0016\text{m/s} \cdot 100}{418 \cdot (2.7 - 1.001) \cdot (0.0013\text{m})^2}\right) - 70}{3}$$

16) Temperature in Fahrenheit given Settling Velocity

Open Calculator

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

ex $$69.98616^\circ\text{F} = \left(\frac{0.0016\text{m/s} \cdot 60}{418 \cdot (0.0013\text{m})^2 \cdot (2.7 - 1.001)}\right) - 10$$

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

Open Calculator

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

ex $$10.10398^\circ F = \frac{0.0016 m/s \cdot 60}{418 \cdot 0.0013 m \cdot (2.7 - 1.001)} + 10$$

Variables Used

- **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

- Function: **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

Check other formula lists

- Diameter of Sediment Particle Formulas
- Displacement and Drag Formulas
- Sedimentation Tank Formulas
- Settling Velocity Formulas
- Settling Zone Formulas
- Specific Gravity and Density Formulas

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