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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

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

Open Calculator 

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

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

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

Open Calculator 

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



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

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

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235_img.jpg\)](#)

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

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

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

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0_img.jpg\)](#)

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

5) Cross-Sectional Area of Sedimentation Tank

$$\text{fx } A = w \cdot h$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f_img.jpg\)](#)

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

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

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

[Open Calculator !\[\]\(b64b40baaee5acddc1eab8538ba84754_img.jpg\)](#)

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



Length of Sedimentation Tank

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

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

[Open Calculator !\[\]\(23d9fc146e83b5c3013cfa32c784f8d5_img.jpg\)](#)

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

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

$$\text{fx } L_S = 10 \cdot h$$

[Open Calculator !\[\]\(aa53ad6fea213b8b2226d3077e30533a_img.jpg\)](#)

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

9) Length of Sedimentation Tank with respect to Surface Area

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

[Open Calculator !\[\]\(626ce8ac21792b9405bfddfea8e0c96a_img.jpg\)](#)

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



Surface Area of Sedimentation Tank

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

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

[Open Calculator !\[\]\(74d4806277d7e73349d8e8c0897931e9_img.jpg\)](#)

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

11) Surface Area of Sedimentation Tank

$$\text{fx } A = w \cdot L_S$$

[Open Calculator !\[\]\(8bba887393ca45b761e5cb49e755e762_img.jpg\)](#)

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

12) Surface Area with respect to Darcy Weishbach Friction Factor

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

[Open Calculator !\[\]\(0fb13ad0bfa3d86868cdd3883e5665b3_img.jpg\)](#)

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

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

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

[Open Calculator !\[\]\(e50091943b385fe16d3277389202856f_img.jpg\)](#)

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



14) Surface Area with respect to Settling Velocity

fx

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

[Open Calculator !\[\]\(950a62bbddad88d64435fd35607dfc42_img.jpg\)](#)

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

fx

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

[Open Calculator !\[\]\(ab4e2b3fc7e7887b7a72f548aa6f5e60_img.jpg\)](#)

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

fx

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

[Open Calculator !\[\]\(097cdd6c9c875b64d9b8c9a2409491c4_img.jpg\)](#)

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

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

[Open Calculator !\[\]\(9dfdaff1d86ba3c1f8353b4d1b61b8c5_img.jpg\)](#)

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



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 ($^{\circ}\text{C}$), Fahrenheit ($^{\circ}\text{F}$)

Temperature Unit Conversion 

- **Measurement:** **Area** in Square Millimeter (mm^2), Square Meter (m^2)

Area Unit Conversion 

- **Measurement:** **Speed** in Meter per Second (m/s)

Speed Unit Conversion 

- **Measurement:** **Volumetric Flow Rate** in Cubic Meter per Second (m^3/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](#) 
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