Settling Zone Formulas...





# **Settling Zone Formulas**

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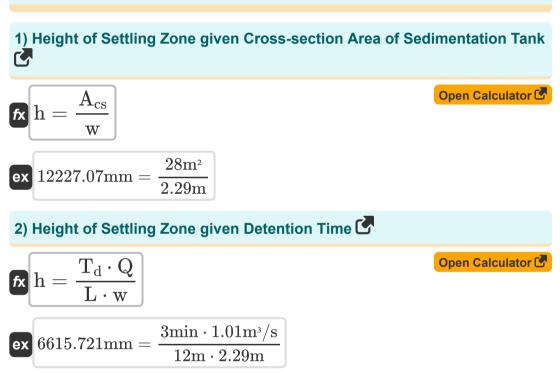




### List of 17 Settling Zone Formulas

### Settling Zone 🕑

#### Height of Settling Zone 🕑





## 3) Height of Settling Zone given Height at Outlet Zone with respect to Area of Tank

$$\mathbf{h} = \mathbf{H} \cdot rac{\mathbf{Q}}{\mathbf{v}' \cdot \mathbf{A}_{\mathrm{cs}}}$$
 Open Calculator **C**

. . .

ex 
$$14428.57$$
mm =  $40$ m  $\cdot \frac{1.01$ m<sup>3</sup>/s}{0.1m/s  $\cdot 28$ m<sup>2</sup>

4) Height of Settling Zone given Height at Outlet Zone with respect to Discharge

fx 
$$\mathbf{h} = \mathbf{H} \cdot \frac{\mathbf{Q}}{\mathbf{L} \cdot \mathbf{w} \cdot \mathbf{v}'}$$

ex 14701.6mm = 40m  $\cdot \frac{1.01$ m<sup>3</sup>/s}{12m \cdot 2.29m  $\cdot 0.1$ m/s

# 5) Height of Settling Zone given Height at Outlet Zone with respect to Settling Velocity

$$\label{eq:h} \textbf{fx} \ h = H \cdot \frac{V_s}{v'}$$
 Open Calculator  $\textbf{F}$  ex  $12000 \text{mm} = 40 \text{m} \cdot \frac{0.03 \text{m/s}}{0.1 \text{m/s}}$ 





Open Calculator

## 6) Height of Settling Zone given Length of Sedimentation Tank with respect to Surface Area

fx 
$$h = L \cdot \frac{A_{cs}}{A}$$
  
ex  $6720mm = 12m \cdot \frac{28m^2}{72m}$ 

7) Height of Settling Zone given Length of Tank with respect to Darcy Weishbach Factor

 $50m^2$ 

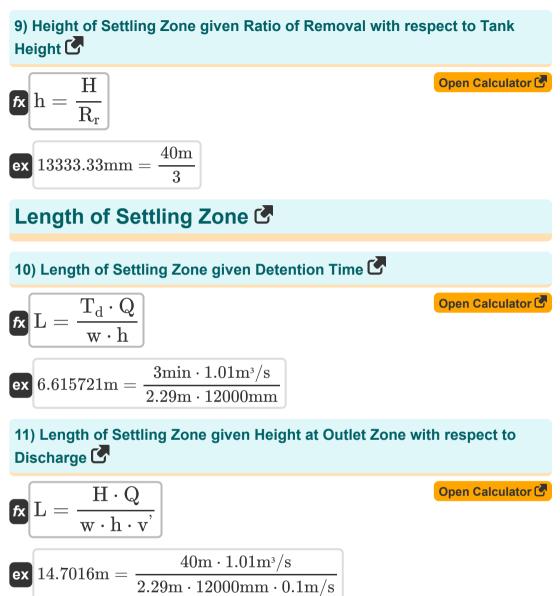
fx 
$$h = L \cdot \sqrt{rac{f}{8}}$$
  
ex  $3000 \mathrm{mm} = 12 \mathrm{m} \cdot \sqrt{rac{0.5}{8}}$ 

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





Open Calculator





Settling Zone Formulas...

12) Length of Settling Zone given Surface Area of Sedimentation Tank



13) Length of Settling Zone given Vertical Falling Speed in Sedimentation Tank

fx 
$$L = \frac{Q}{V_s \cdot w}$$
  
ex  $14.7016m = \frac{1.01m^3/s}{0.03m/s \cdot 2.29m}$ 

### Width of Settling Zone 🕑

## 14) Width of Settling Zone given Cross-section Area of Sedimentation Tank

fx 
$$W = \frac{A_{cs}}{h}$$
  
ex  $2.333333$  J/kg  $= \frac{28m^2}{12000$ mm





**C**A

Settling Zone Formulas...

#### 15) Width of Settling Zone given Detention Time 🕑

$$\mathbf{fx} W = \frac{T_d \cdot Q}{L \cdot h}$$
Open Calculator C
$$3min \cdot 1.01m^3/s$$

ex 
$$1.2625 \text{J/kg} = \frac{3 \text{min} \cdot 1.01 \text{m}^3/\text{s}}{12 \text{m} \cdot 12000 \text{mm}}$$

16) Width of Settling Zone given Height at Outlet Zone with respect to Discharge

fx 
$$W = H \cdot \frac{Q}{L \cdot h \cdot v'}$$
 Open Calculator  $C$ 

$$2.805556 \text{J/kg} = 40 \text{m} \cdot \frac{1}{12 \text{m} \cdot 12000 \text{mm} \cdot 0.1 \text{m/s}}$$

#### 17) Width of Settling Zone given Surface Area of Sedimentation Tank

fx 
$$W = \frac{A}{L}$$
  
ex  $4.1666667 J/kg = \frac{50m^2}{12m}$ 



Open Calculator

### Variables Used

- A Area (Square Meter)
- Acs Cross-Sectional Area (Square Meter)
- f Darcy Friction Factor
- h Height of Crack (Millimeter)
- **H** Outer Height (Meter)
- L Length (Meter)
- **Q** Discharge (Cubic Meter per Second)
- R<sub>r</sub> Removal Ratio
- T<sub>d</sub> Detention Time (Minute)
- V<sub>s</sub> Settling Velocity (Meter per Second)
- **v** Falling Speed (Meter per Second)
- W Width (Meter)
- W Width of Settling Zone (Joule per Kilogram)



### **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 Millimeter (mm), Meter (m)
   Length Unit Conversion
- Measurement: Time in Minute (min) Time Unit Conversion
- Measurement: Area in Square Meter (m<sup>2</sup>) Area Unit Conversion
- Measurement: Speed in Meter per Second (m/s)
   Speed Unit Conversion
- Measurement: Volumetric Flow Rate in Cubic Meter per Second (m<sup>3</sup>/s) Volumetric Flow Rate Unit Conversion
- Measurement: Latent Heat in Joule per Kilogram (J/kg) Latent Heat Unit Conversion



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