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Diameter of Sediment Particle Formulas

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List of 10 Diameter of Sediment Particle Formulas

Diameter of Sediment Particle

1) Diameter for Settling Velocity with respect to Kinematic Viscosity

Open Calculator

fx $$d = \sqrt{\frac{v_s \cdot 18 \cdot \nu}{[g] \cdot (G_s - G_w)}}$$

ex $$0.001119\text{m} = \sqrt{\frac{0.0016\text{m/s} \cdot 18 \cdot 7.25\text{St}}{[g] \cdot (2.7 - 1.001)}}$$

2) Diameter given Settling Velocity at 10 degree Celsius

Open Calculator

fx $$d = \sqrt{\frac{v_s}{418 \cdot (G_s - G_w)}}$$

ex $$0.001501\text{m} = \sqrt{\frac{0.0016\text{m/s}}{418 \cdot (2.7 - 1.001)}}$$

3) Diameter given Settling Velocity given Celsius

Open Calculator

fx
$$d = \sqrt{\frac{v_s \cdot 100}{418 \cdot (G_s - G_w) \cdot (3 \cdot t + 70)}}$$

ex
$$0.000475\text{m} = \sqrt{\frac{0.0016\text{m/s} \cdot 100}{418 \cdot (2.7 - 1.001) \cdot (3 \cdot 36^\circ\text{C} + 70)}}$$

4) Diameter given Settling Velocity in Fahrenheit

Open Calculator

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

ex
$$0.000651\text{m} = \sqrt{\frac{0.0016\text{m/s}}{418 \cdot (2.7 - 1.001) \cdot \left(\frac{96.8^\circ\text{F} + 10}{60}\right)}}$$

5) Diameter given Settling Velocity with respect to Dynamic Viscosity

Open Calculator

fx
$$d = \sqrt{\frac{18 \cdot v_s \cdot \mu_{viscosity}}{[g] \cdot (\rho_m - \rho_f)}}$$

ex
$$0.001327\text{m} = \sqrt{\frac{18 \cdot 0.0016\text{m/s} \cdot 10.2\text{P}}{[g] \cdot (2700\text{kg/m}^3 - 1000\text{kg/m}^3)}}$$

6) Diameter given Specific Gravity of Particle and Viscosity

Open Calculator

fx $$d = \sqrt{\frac{v_s \cdot \nu \cdot 18}{[g] \cdot (G_s - 1)}}$$

ex $$0.001119\text{m} = \sqrt{\frac{0.0016\text{m/s} \cdot 7.25\text{St} \cdot 18}{[g] \cdot (2.7 - 1)}}$$

7) Diameter of Particle given Particle Reynold's Number

Open Calculator

fx $$d = \frac{\mu_{viscosity} \cdot Re}{\rho_f \cdot v_s}$$

ex $$0.01275\text{m} = \frac{10.2\text{P} \cdot 0.02}{1000\text{kg/m}^3 \cdot 0.0016\text{m/s}}$$

8) Diameter of Particle given Settling Velocity

Open Calculator

fx $$d = \frac{3 \cdot C_D \cdot \rho_f \cdot v_s^2}{4 \cdot [g] \cdot (\rho_m - \rho_f)}$$

ex $$0.000138\text{m} = \frac{3 \cdot 1200 \cdot 1000\text{kg/m}^3 \cdot (0.0016\text{m/s})^2}{4 \cdot [g] \cdot (2700\text{kg/m}^3 - 1000\text{kg/m}^3)}$$

9) Diameter of Particle given Settling Velocity with respect to Specific Gravity

Open Calculator

fx $$d = \frac{3 \cdot C_D \cdot v_s^2}{4 \cdot [g] \cdot (G_s - 1)}$$

ex $$0.000138\text{m} = \frac{3 \cdot 1200 \cdot (0.0016\text{m/s})^2}{4 \cdot [g] \cdot (2.7 - 1)}$$

10) Diameter of Particle given Volume of Particle

Open Calculator

fx $$d = \left(6 \cdot \frac{V_p}{\pi}\right)^{\frac{1}{3}}$$

ex $$0.0013\text{m} = \left(6 \cdot \frac{1.15\text{mm}^3}{\pi}\right)^{\frac{1}{3}}$$

Variables Used

- C_D Drag Coefficient
- **d** Diameter of a Spherical Particle *(Meter)*
- G_s Specific Gravity of Spherical Particle
- G_w Specific Gravity of Fluid
- **Re** Reynold Number
- **t** Temperature in Centigrade *(Celsius)*
- T_F Temperature in Fahrenheit *(Fahrenheit)*
- V_p Volume of One Particle *(Cubic Millimeter)*
- v_s Settling Velocity of Particles *(Meter per Second)*
- $\mu_{viscosity}$ Dynamic Viscosity *(Poise)*
- **v** Kinematic Viscosity *(Stokes)*
- ρ_f Mass Density of Fluid *(Kilogram per Cubic Meter)*
- ρ_m Mass Density of Particles *(Kilogram per Cubic Meter)*

Constants, Functions, Measurements used

- Constant: **pi**, 3.14159265358979323846264338327950288
  Archimedes' constant
- Constant: **[g]**, 9.80665
  Gravitational acceleration on Earth
- 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)
  Length Unit Conversion
- Measurement: **Temperature** in Celsius (°C), Fahrenheit (°F)
  Temperature Unit Conversion
- Measurement: **Volume** in Cubic Millimeter (mm³)
  Volume Unit Conversion
- Measurement: **Speed** in Meter per Second (m/s)
  Speed Unit Conversion
- Measurement: **Dynamic Viscosity** in Poise (P)
  Dynamic Viscosity Unit Conversion
- Measurement: **Mass Concentration** in Kilogram per Cubic Meter (kg/m³)
  Mass Concentration Unit Conversion
- Measurement: **Kinematic Viscosity** in Stokes (St)
  Kinematic Viscosity Unit Conversion
- Measurement: **Density** in Kilogram per Cubic Meter (kg/m³)
  Density Unit Conversion

Check other formula lists

- **Diameter of Sediment Particle Formulas**
- **Displacement and Drag Formulas**
- **Sedimentation Tank Formulas**
- **Specific Gravity and Density Formulas**

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