



Darcy's Weisbach Equation Formulas

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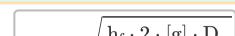




List of 10 Darcy's Weisbach Equation Formulas

Darcy's Weisbach Equation

1) Average Velocity of Flow given Head Loss



$$extbf{v}_{
m avg} = \sqrt{rac{ ext{h}_{
m f} \cdot 2 \cdot [
m g] \cdot ext{D}_{
m p}}{4 \cdot ext{f} \cdot ext{L}_{
m p}}}$$

ex
$$4.573932 ext{m/s} = \sqrt{rac{1.2 ext{m} \cdot 2 \cdot [ext{g}] \cdot 0.4 ext{m}}{4 \cdot 0.045 \cdot 2.5 ext{m}}}$$

2) Average Velocity of Flow given Internal Radius of Pipe 🗗

$$\left| \mathbf{r} \mathbf{v}_{\mathrm{avg}} = \sqrt{rac{\mathrm{h_f} \cdot [\mathrm{g}] \cdot \mathrm{R}}{\mathrm{f} \cdot \mathrm{L_p}}}
ight|$$

$$ext{ex} egin{aligned} 4.573932 ext{m/s} &= \sqrt{rac{1.2 ext{m} \cdot [ext{g}] \cdot 200 ext{mm}}{0.045 \cdot 2.5 ext{m}}} \end{aligned}$$



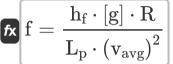
3) Darcy's Coefficient of Friction given Head Loss

 $\mathbf{f} = rac{\mathrm{h_f} \cdot 2 \cdot [\mathrm{g}] \cdot \mathrm{D_p}}{4 \cdot \mathrm{L_p} \cdot (\mathrm{v_{avg}})^2}$

Open Calculator

$$\boxed{ 0.045077 = \frac{1.2 \text{m} \cdot 2 \cdot [\text{g}] \cdot 0.4 \text{m}}{4 \cdot 2.5 \text{m} \cdot (4.57 \text{m/s})^2} }$$

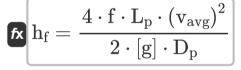
4) Darcy's Coefficient of Friction given Internal Radius of Pipe



Open Calculator

ex
$$0.045077 = \frac{1.2 \text{m} \cdot [\text{g}] \cdot 200 \text{mm}}{2.5 \text{m} \cdot (4.57 \text{m/s})^2}$$

5) Head Loss due to Friction by Darcy Weisbach Equation



Open Calculator

$$\boxed{1.197938 \text{m} = \frac{4 \cdot 0.045 \cdot 2.5 \text{m} \cdot (4.57 \text{m/s})^2}{2 \cdot [\text{g}] \cdot 0.4 \text{m}}}$$



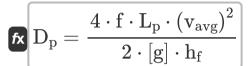
6) Head Loss due to Friction given Internal Radius of Pipe

 $\mathbf{f}_{\mathbf{f}} \mathbf{h}_{\mathrm{f}} = rac{\mathbf{f} \cdot \mathbf{L}_{\mathrm{p}} \cdot \left(\mathbf{v}_{\mathrm{avg}}
ight)^2}{\left[\mathbf{g}
ight] \cdot \mathbf{R}}$

Open Calculator

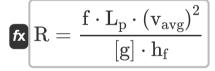
$$\boxed{ 1.197938 \text{m} = \frac{0.045 \cdot 2.5 \text{m} \cdot (4.57 \text{m/s})^2}{[\text{g}] \cdot 200 \text{mm}} }$$

7) Internal Diameter of Pipe given Head Loss



Open Calculator

8) Internal Radius of Pipe given Head Loss



Open Calculator



9) Length of Pipe given Head Loss due to Friction 🗗

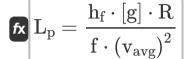


Open Calculator

$$\mathbf{L}_{\mathrm{p}} = rac{\mathrm{h_f} \cdot 2 \cdot [\mathrm{g}] \cdot \mathrm{D_p}}{4 \cdot \mathrm{f} \cdot \left(\mathrm{v_{avg}}
ight)^2}$$

$$= 2.504304 \text{m} = \frac{1.2 \text{m} \cdot 2 \cdot [\text{g}] \cdot 0.4 \text{m}}{4 \cdot 0.045 \cdot (4.57 \text{m/s})^2}$$

10) Length of Pipe given Internal Radius of Pipe



Open Calculator

$$= 2.504304 \text{m} = \frac{1.2 \text{m} \cdot [\text{g}] \cdot 200 \text{mm}}{0.045 \cdot (4.57 \text{m/s})^2}$$



Variables Used

- **D**_D Diameter of Pipe (Meter)
- f Darcy's Coefficient of Friction
- h_f Head Loss (Meter)
- Lp Length of Pipe (Meter)
- R Pipe Radius (Millimeter)
- Vavq Average Velocity in Pipe Fluid Flow (Meter per Second)





Constants, Functions, Measurements used

- 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), Millimeter (mm)

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





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