



Coefficient of Permeability Formulas

Calculators!

Examples!

Conversions!

Bookmark calculatoratoz.com, unitsconverters.com

Widest Coverage of Calculators and Growing - 30,000+ Calculators!

Calculate With a Different Unit for Each Variable - In built Unit Conversion!

Widest Collection of Measurements and Units - 250+ Measurements!

Feel free to SHARE this document with your friends!

Please leave your feedback here...





List of 21 Coefficient of Permeability Formulas

Coefficient of Permeability 2

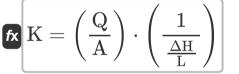
1) Coefficient of Permeability at any Temperature t for Standard Value of Coefficient of Permeability

$$egin{equation} \mathbf{K}_{\mathrm{t}} = rac{\mathrm{K_{s} \cdot v_{s}}}{\mathrm{v_{t}}} \label{eq:Kt}$$

Open Calculator

$$ext{ex} \ 4.17 ext{cm/s} = rac{8.34 \cdot 12 ext{m}^2/ ext{s}}{24 ext{m}^2/ ext{s}}$$

2) Coefficient of Permeability at Temperature of Permeameter Experiment



Open Calculator

$$= \left(\frac{3.0 \mathrm{m}^3/\mathrm{s}}{100 \mathrm{m}^2} \right) \cdot \left(\frac{1}{\frac{2}{3.9 \mathrm{m}}} \right)$$

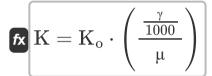


3) Coefficient of Permeability from Analogy of Laminar Flow (Hagen Poiseuille flow)

 $\left| \mathrm{K}_{ ext{H-P}} = \mathrm{C} \cdot \left(\mathrm{d}_{\mathrm{m}}^2
ight) \cdot rac{rac{\gamma}{1000}}{\mu}
ight|$

Open Calculator

4) Coefficient of Permeability when Specific or Intrinsic Permeability is Considered



Open Calculator

$$ext{ex} \left[6.049693 ext{cm/s} = 0.00987 ext{m}^2 \cdot \left(rac{9.807 ext{kN/m}^3}{1000}
ight)
ight]$$

5) Coefficient of Permeability when Transmissibility is Considered



Open Calculator 🗗

$$m = 23.33333cm/s = rac{3.5m^2/s}{15m}$$



- 6) Cross-Sectional Area when Coefficient of Permeability at Permeameter Experiment is Considered
- $\mathbf{K} \mathbf{A} = rac{\mathbf{Q}}{\mathbf{K} \cdot \left(rac{\Delta H}{\mathbf{L}}
 ight)}$

Open Calculator 🗗

- $oxed{ex} 97.5 \mathrm{m}^2 = rac{3.0 \mathrm{m}^3/\mathrm{s}}{6 \mathrm{cm/s} \cdot \left(rac{2}{3.9 \mathrm{m}}
 ight)}$
 - 7) Discharge when Coefficient of Permeability at Permeameter Experiment is Considered
- $\left| \mathbf{R} \right| \mathbf{Q} = \mathbf{K} \cdot \mathbf{A} \cdot \left(rac{\Delta \mathbf{H}}{\mathbf{L}}
 ight)$

Open Calculator 🗗

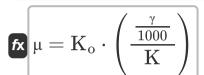
- $oxed{3.076923 ext{m}^3/ ext{s} = 6 ext{cm/s} \cdot 100 ext{m}^2 \cdot \left(rac{2}{3.9 ext{m}}
 ight)}$
- 8) Dynamic Viscosity of Fluid of Laminar Flow through Conduit or Hagen Poiseuille Flow
- $\mathbf{fx} \Bigg| \mu = \left(C \cdot d_m^2
 ight) \cdot \left(rac{rac{\gamma}{1000}}{\mathrm{K}_{ ext{H-P}}}
 ight) \Bigg|$

Open Calculator 🚰

ex
$$1.601143 ext{Pa*s} = \left(1.8 \cdot (0.02 ext{m})^2\right) \cdot \left(\frac{\frac{9.807 ext{kN/m}^3}{1000}}{0.441 ext{cm/s}}\right)$$



9) Dynamic Viscosity when Specific or Intrinsic Permeability is Considered



Open Calculator 🗗

$$ext{ex} \ 1.613252 ext{Pa*s} = 0.00987 ext{m}^2 \cdot \left(rac{rac{9.807 ext{kN/m}^3}{1000}}{6 ext{cm/s}}
ight)$$

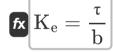
10) Equation for Specific or Intrinsic Permeability



Open Calculator

$$ext{ex} \left[0.00072 ext{m}^2 = 1.8 \cdot \left(0.02 ext{m}
ight)^2
ight]$$





Open Calculator 🗗

$$oxed{ex} 9.333333 ext{cm/s} = rac{1.4 ext{m}^2/ ext{s}}{15 ext{m}}$$



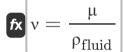
12) Hagen Poiseuille Flow or Mean Particle Size of Porous Medium Laminar Flow through Conduit

 \mathbf{f} $d_{m} = \sqrt{rac{K_{ ext{H-P}} \cdot \mu}{C \cdot \left(rac{\gamma}{1000}
ight)}}$

Open Calculator 🗗

$$extbf{ex} 0.019993 ext{m} = \sqrt{rac{0.441 ext{cm/s} \cdot 1.6 ext{Pa*s}}{1.8 \cdot \left(rac{9.807 ext{kN/m}^3}{1000}
ight)}}$$

13) Kinematic Viscosity and Dynamic Viscosity Relation



Open Calculator

$$0.001605 \mathrm{m}^2/\mathrm{s} = rac{1.6 \mathrm{Pa}^* \mathrm{s}}{997 \mathrm{kg/m}^3}$$

14) Kinematic Viscosity at 20 degree Celsius for Standard Value of Coefficient of Permeability

$$\mathbf{x} \mathbf{v}_{\mathrm{s}} = rac{K_{\mathrm{t}} \cdot v_{\mathrm{t}}}{K_{\mathrm{s}}}$$

Open Calculator 🗗

$$oxed{ex} 0.12 \mathrm{m}^2/\mathrm{s} = rac{4.17 \mathrm{cm/s} \cdot 24 \mathrm{m}^2/\mathrm{s}}{8.34}$$



15) Kinematic Viscosity for Standard Value of Coefficient of Permeability

٢

fx
$$egin{equation} \mathbf{v}_{\mathrm{t}} = rac{\mathbf{K}_{\mathrm{s}} \cdot \mathbf{v}_{\mathrm{s}}}{\mathbf{K}_{\mathrm{t}}} \end{bmatrix}$$

Open Calculator 🗗

$$m ex \ 24m^2/s = rac{8.34 \cdot 12m^2/s}{4.17cm/s}$$

16) Kinematic Viscosity when Specific or Intrinsic Permeability is Considered



Open Calculator

$$oxed{ex} 0.96726 \mathrm{m}^2/\mathrm{s} = rac{0.00987 \mathrm{m}^2 \cdot 9.8 \mathrm{m/s}^2}{10 \mathrm{cm/s}}$$

17) Length when Coefficient of Permeability at Permeameter Experiment is Considered

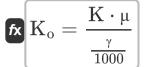


Open Calculator 🚰

$$m = rac{2 \cdot 100 m^2 \cdot 6 cm/s}{3.0 m^3/s}$$



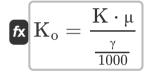
18) Specific or Intrinsic Permeability when Coefficient of Permeability is Considered



Open Calculator

$$ext{ex} 0.009789 ext{m}^2 = rac{6 ext{cm/s} \cdot 1.6 ext{Pa*s}}{rac{9.807 ext{kN/m}^3}{1000}}$$

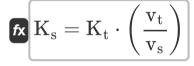
19) Specific or Intrinsic Permeability when Dynamic Viscosity is Considered



Open Calculator

$$\begin{array}{c} \text{ex} \\ 0.009789 \\ \text{m}^{_{2}} = \\ \frac{6 \\ \text{cm/s} \cdot 1.6 \\ \text{Pa*s}}{\frac{9.807 \\ \text{kN/m}^{_{3}}}{1000}} \end{array}$$

20) Standard Value of Coefficient of Permeability



Open Calculator

$$oxed{ex} 8.34 = 4.17 \mathrm{cm/s} \cdot \left(rac{24 \mathrm{m^2/s}}{12 \mathrm{m^2/s}}
ight)$$



21) Unit weight of fluid



Open Calculator

 $\text{ex} \ 9.7706 \text{kN/m}^{_3} = 997 \text{kg/m}^{_3} \cdot 9.8 \text{m/s}^{_2}$



Variables Used

- A Cross-Sectional Area (Square Meter)
- **b** Aquifer Thickness (*Meter*)
- C Shape Factor
- d_m Mean Particle Size of the Porous Medium (Meter)
- g Acceleration due to Gravity (Meter per Square Second)
- k Coefficient of Permeability (Centimeter per Second)
- K Coefficient of Permeability at 20° C (Centimeter per Second)
- K_e Equivalent Permeability (Centimeter per Second)
- K_{H-P} Coefficient of Permeability (Hagen-Poiseuille) (Centimeter per Second)
- K_o Intrinsic Permeability (Square Meter)
- K_S Standard Coefficient of Permeability at 20°C
- K_t Coefficient of Permeability at any Temperature t (Centimeter per Second)
- L Length (Meter)
- Q Discharge (Cubic Meter per Second)
- T Transmissibility (Square Meter per Second)
- V_s Kinematic Viscosity at 20° C (Square Meter per Second)
- V_t Kinematic Viscosity at t° C (Square Meter per Second)
- Y Unit Weight of Fluid (Kilonewton per Cubic Meter)
- AH Constant Head Difference
- µ Dynamic Viscosity of the Fluid (Pascal Second)
- V Kinematic Viscosity (Square Meter per Second)





- **P**fluid Density of Fluid (Kilogram per Cubic Meter)
- T Transmissivity (Square Meter per Second)





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)

 Length Unit Conversion
- Measurement: Area in Square Meter (m²)

 Area Unit Conversion
- Measurement: Speed in Centimeter per Second (cm/s)
 Speed Unit Conversion
- Measurement: Acceleration in Meter per Square Second (m/s²)
 Acceleration Unit Conversion
- Measurement: Volumetric Flow Rate in Cubic Meter per Second (m³/s)
 Volumetric Flow Rate Unit Conversion
- Measurement: Dynamic Viscosity in Pascal Second (Pa*s)
 Dynamic Viscosity Unit Conversion
- Measurement: Kinematic Viscosity in Square Meter per Second (m²/s)
 Kinematic Viscosity Unit Conversion
- Measurement: Density in Kilogram per Cubic Meter (kg/m³)
 Density Unit Conversion
- Measurement: Specific Weight in Kilonewton per Cubic Meter (kN/m³) Specific Weight Unit Conversion





Check other formula lists

- Aquifer Analysis and Properties
 Formulas
- Coefficient of Permeability
 Formulas
- Distance Drawdown Analysis
 Formulas
- Open Wells Formulas

- Steady Flow into a Well Formulas
- Unconfined Flow Formulas
- Unsteady Flow in a Confined Aquifer Formulas
- Well Parameters Formulas

Feel free to SHARE this document with your friends!

PDF Available in

English Spanish French German Russian Italian Portuguese Polish Dutch

7/29/2024 | 5:11:05 AM UTC

Please leave your feedback here...



