calculatoratoz.com

unitsconverters.com

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

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

Open Calculator

fx $$K_t = \frac{K_s \cdot v_s}{v_t}$$

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

2) Coefficient of Permeability at Temperature of Permeameter Experiment

Open Calculator

fx $$K = \left(\frac{Q}{A}\right) \cdot \left(\frac{1}{\frac{\Delta H}{L}}\right)$$

ex $$5.85\text{cm/s} = \left(\frac{3.0\text{m}^3/\text{s}}{100\text{m}^2}\right) \cdot \left(\frac{1}{\frac{2}{3.9\text{m}}}\right)$$

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

Open Calculator

fx $$K_{H\text{-}P} = C \cdot \left(d_m^2\right) \cdot \frac{\frac{\gamma}{1000}}{\mu}$$

ex $$0.441315\text{cm/s} = 1.8 \cdot \left((0.02\text{m})^2\right) \cdot \frac{\frac{9.807\text{kN/m}^3}{1000}}{1.6\text{Pa*s}}$$

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

Open Calculator

fx $$K = K_o \cdot \left(\frac{\frac{\gamma}{1000}}{\mu}\right)$$

ex $$6.049693\text{cm/s} = 0.00987\text{m}^2 \cdot \left(\frac{\frac{9.807\text{kN/m}^3}{1000}}{1.6\text{Pa*s}}\right)$$

5) Coefficient of Permeability when Transmissibility is Considered

Open Calculator

fx $$k = \frac{T}{b}$$

ex $$23.33333\text{cm/s} = \frac{3.5\text{m}^2/\text{s}}{15\text{m}}$$

6) Cross-Sectional Area when Coefficient of Permeability at Permeameter Experiment is Considered

Open Calculator

fx $$A = \frac{Q}{K \cdot \left(\frac{\Delta H}{L}\right)}$$

ex $$97.5\text{m}^2 = \frac{3.0\text{m}^3/\text{s}}{6\text{cm/s} \cdot \left(\frac{2}{3.9\text{m}}\right)}$$

7) Discharge when Coefficient of Permeability at Permeameter Experiment is Considered

Open Calculator

fx $$Q = K \cdot A \cdot \left(\frac{\Delta H}{L}\right)$$

ex $$3.076923\text{m}^3/\text{s} = 6\text{cm/s} \cdot 100\text{m}^2 \cdot \left(\frac{2}{3.9\text{m}}\right)$$

8) Dynamic Viscosity of Fluid of Laminar Flow through Conduit or Hagen Poiseuille Flow

Open Calculator

fx $$\mu = \left(C \cdot d_m^2\right) \cdot \left(\frac{\frac{\gamma}{1000}}{K_{H\text{-}P}}\right)$$

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

9) Dynamic Viscosity when Specific or Intrinsic Permeability is Considered

Open Calculator

fx $$\mu = K_o \cdot \left(\frac{\frac{\gamma}{1000}}{K} \right)$$

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

10) Equation for Specific or Intrinsic Permeability

Open Calculator

fx $$K_o = C \cdot d_m^2$$

ex $$0.00072\text{m}^2 = 1.8 \cdot (0.02\text{m})^2$$

11) Equivalent Permeability when Transmissivity of Aquifer is Considered

Open Calculator

fx $$K_e = \frac{\tau}{b}$$

ex $$9.333333\text{cm/s} = \frac{1.4\text{m}^2/\text{s}}{15\text{m}}$$

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

Open Calculator

fx $$d_m = \sqrt{\frac{K_{H\text{-}P} \cdot \mu}{C \cdot \left(\frac{\gamma}{1000}\right)}}$$

ex $$0.019993\text{m} = \sqrt{\frac{0.441\text{cm/s} \cdot 1.6\text{Pa*s}}{1.8 \cdot \left(\frac{9.807\text{kN/m}^3}{1000}\right)}}$$

13) Kinematic Viscosity and Dynamic Viscosity Relation

Open Calculator

fx $$\nu = \frac{\mu}{\rho_{fluid}}$$

ex $$0.001605\text{m}^2/\text{s} = \frac{1.6\text{Pa*s}}{997\text{kg/m}^3}$$

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

Open Calculator

fx $$v_s = \frac{K_t \cdot v_t}{K_s}$$

ex $$0.12\text{m}^2/\text{s} = \frac{4.17\text{cm/s} \cdot 24\text{m}^2/\text{s}}{8.34}$$

15) Kinematic Viscosity for Standard Value of Coefficient of Permeability

Open Calculator

$$v_t = \frac{K_s \cdot v_s}{K_t}$$

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

16) Kinematic Viscosity when Specific or Intrinsic Permeability is Considered

Open Calculator

$$\nu = \frac{K_o \cdot g}{k}$$

$$0.96726\text{m}^2/\text{s} = \frac{0.00987\text{m}^2 \cdot 9.8\text{m/s}^2}{10\text{cm/s}}$$

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

Open Calculator

$$L = \frac{\Delta H \cdot A \cdot K}{Q}$$

$$4\text{m} = \frac{2 \cdot 100\text{m}^2 \cdot 6\text{cm/s}}{3.0\text{m}^3/\text{s}}$$

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

Open Calculator

fx $$K_o = \frac{K \cdot \mu}{\frac{\gamma}{1000}}$$

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

19) Specific or Intrinsic Permeability when Dynamic Viscosity is Considered

Open Calculator

fx $$K_o = \frac{K \cdot \mu}{\frac{\gamma}{1000}}$$

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

20) Standard Value of Coefficient of Permeability

Open Calculator

fx $$K_s = K_t \cdot \left(\frac{v_t}{v_s}\right)$$

ex $$8.34 = 4.17\text{cm/s} \cdot \left(\frac{24\text{m}^2/\text{s}}{12\text{m}^2/\text{s}}\right)$$

21) Unit weight of fluid

Open Calculator

fx $\gamma = \rho_{fluid} \cdot g$

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)*
- $K_{H\text{-}P}$ 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)*
- **γ** Unit Weight of Fluid *(Kilonewton per Cubic Meter)*
- **ΔH** Constant Head Difference
- **μ** Dynamic Viscosity of the Fluid *(Pascal Second)*
- **v** Kinematic Viscosity *(Square Meter per Second)*

- ρ_{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...