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Permeability Number Formulas

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List of 11 Permeability Number Formulas

Permeability Number

1) Air Pressure during Testing

Open Calculator

fx $$\rho = \frac{V \cdot H_{sp}}{PN \cdot A \cdot t_p}$$

ex $$0.038461\text{kgf/m}^2 = \frac{0.002\text{m}^3 \cdot 5\text{m}}{4.36\text{H/m} \cdot 0.002027\text{m}^2 \cdot 3\text{s}}$$

2) Cross-Sectional Area of Specimen

Open Calculator

fx $$A = \frac{V \cdot H_{sp}}{PN \cdot \rho \cdot t_p}$$

ex $$0.002025\text{m}^2 = \frac{0.002\text{m}^3 \cdot 5\text{m}}{4.36\text{H/m} \cdot 0.0385\text{kgf/m}^2 \cdot 3\text{s}}$$

3) Grain Fineness Number

Open Calculator

fx $$GFN = \frac{\Sigma FM}{\Sigma F_i}$$

ex $$4.010283 = \frac{15.6\text{g}}{3.89\text{g}}$$

4) Height of Specimen

Open Calculator

$$H_{sp} = \frac{PN \cdot \rho \cdot A \cdot t_p}{V}$$

$$5.005102\text{m} = \frac{4.36\text{H/m} \cdot 0.0385\text{kgf/m}^2 \cdot 0.002027\text{m}^2 \cdot 3\text{s}}{0.002\text{m}^3}$$

5) Permeability Number

Open Calculator

$$PN = \frac{V_{air} \cdot h_s}{\rho \cdot A \cdot t_p}$$

$$4.361654\text{H/m} = \frac{0.001669\text{m}^3 \cdot 6\text{m}}{0.0385\text{kgf/m}^2 \cdot 0.002027\text{m}^2 \cdot 3\text{s}}$$

6) Permeability Number or Standard Specimen

Open Calculator

$$PN = \frac{501.28}{p_c \cdot t_p}$$

$$4.368917\text{H/m} = \frac{501.28}{3.9\text{kgf/m}^2 \cdot 3\text{s}}$$

7) Pressure during Testing or Standard Specimen

Open Calculator

$$p_c = \frac{501.28}{PN \cdot t_p}$$

$$3.907977\text{kgf/m}^2 = \frac{501.28}{4.36\text{H/m} \cdot 3\text{s}}$$

8) Ranginess Factor

Open Calculator

$$\mathrm{R} = \frac{\mathrm{M_{cb}}}{\mathrm{M_c}}$$

$$1.5 = \frac{15\mathrm{m}}{10\mathrm{m}}$$

9) Time Taken during Testing

Open Calculator

$$\mathrm{t_p} = \frac{\mathrm{V} \cdot \mathrm{H_{sp}}}{\mathrm{PN} \cdot \rho \cdot \mathrm{A}}$$

$$2.996942\mathrm{s} = \frac{0.002\mathrm{m^3} \cdot 5\mathrm{m}}{4.36\mathrm{H/m} \cdot 0.0385\mathrm{kgf/m^2} \cdot 0.002027\mathrm{m^2}}$$

10) Time Taken in Standard Specimen Testing

Open Calculator

$$\mathrm{t_p} = \frac{501.28}{\mathrm{PN} \cdot \mathrm{p_c}}$$

$$3.006136\mathrm{s} = \frac{501.28}{4.36\mathrm{H/m} \cdot 3.9\mathrm{kgf/m^2}}$$

11) Volume of Air Passed through Specimen

Open Calculator

$$\mathrm{V} = \frac{\mathrm{PN} \cdot \rho \cdot \mathrm{A} \cdot \mathrm{t_p}}{\mathrm{H_{sp}}}$$

$$0.002002\mathrm{m^3} = \frac{4.36\mathrm{H/m} \cdot 0.0385\mathrm{kgf/m^2} \cdot 0.002027\mathrm{m^2} \cdot 3\mathrm{s}}{5\mathrm{m}}$$

Variables Used

- **A** Cross-Sectional Area of Specimen *(Square Meter)*
- **GFN** Grain Fineness Number
- h_s Height of Specimen *(Meter)*
- H_{sp} Specimen Height *(Meter)*
- M_c Modulus of Casting *(Meter)*
- M_{cb} Modulus of Cube of Same Volume *(Meter)*
- p_c Pressure in Casting *(Kilogram-Force per Square Meter)*
- **PN** Permeability Number *(Henry per Meter)*
- **R** Ranginess Factor
- t_p Time *(Second)*
- **V** Volume of Air Flow Through Specimen *(Cubic Meter)*
- V_{air} Volume of Air in Casting *(Cubic Meter)*
- ρ Air Pressure on Wall *(Kilogram-Force per Square Meter)*
- ΣF_i Total Mass of Sand *(Gram)*
- **ΣFM** Sum of Product of Factor And Grams *(Gram)*

Constants, Functions, Measurements used

- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Weight** in Gram (g)
  Weight Unit Conversion
- Measurement: **Time** in Second (s)
  Time Unit Conversion
- Measurement: **Volume** in Cubic Meter (m^3)
  Volume Unit Conversion
- Measurement: **Area** in Square Meter (m^2)
  Area Unit Conversion
- Measurement: **Pressure** in Kilogram-Force per Square Meter (kgf/m^2)
  Pressure Unit Conversion
- Measurement: **Magnetic Permeability** in Henry per Meter (H/m)
  Magnetic Permeability Unit Conversion

Check other formula lists

- **Permeability Number Formulas**

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