Important Permeability Number Formulas PDF

Formulas
Examples
with Units

List of 11
Important Permeability Number Formulas

1) Air Pressure during Testing Formula

Evaluate Formula

Formula

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

Example with Units

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

2) Cross-Sectional Area of Specimen Formula

Evaluate Formula

Formula

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

Example with Units

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

3) Grain Fineness Number Formula

Evaluate Formula

Formula

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

Example with Units

$$4.0103 = \frac{15.6\,\text{g}}{3.89\,\text{g}}$$

4) Height of Specimen Formula

Evaluate Formula

Formula

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

Example with Units

$$5.0051\,\text{m} = \frac{4.36\,\text{H/m} \cdot 0.0385\,\text{kgf/m}^2 \cdot 0.002027\,\text{m}^2 \cdot 3\,\text{s}}{0.002\,\text{m}^3}$$

5) Permeability Number Formula

Evaluate Formula

Formula

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

Example with Units

$$4.3617\,\text{H/m} = \frac{0.001669\,\text{m}^3 \cdot 6\,\text{m}}{0.0385\,\text{kgf/m}^2 \cdot 0.002027\,\text{m}^2 \cdot 3\,\text{s}}$$

6) Permeability Number or Standard Specimen Formula

Evaluate Formula

Formula

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

Example with Units

$$4.3689\,\text{H/m} = \frac{501.28}{3.9\,\text{kgf/m}^2 \cdot 3\,\text{s}}$$

7) Pressure during Testing or Standard Specimen Formula

Evaluate Formula

Formula

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

Example with Units

$$3.908\,\text{kgf/m}^2 = \frac{501.28}{4.36\,\text{H/m} \cdot 3\,\text{s}}$$

8) Ranginess Factor Formula

Evaluate Formula

Formula

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

Example with Units

$$1.5 = \frac{15\,\text{m}}{10\,\text{m}}$$

9) Time Taken during Testing Formula

Evaluate Formula

Formula

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

Example with Units

$$2.9969\,\text{s} = \frac{0.002\,\text{m}^3 \cdot 5\,\text{m}}{4.36\,\text{H/m} \cdot 0.0385\,\text{kgf/m}^2 \cdot 0.002027\,\text{m}^2}$$

10) Time Taken in Standard Specimen Testing Formula

Evaluate Formula

Formula

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

Example with Units

$$3.0061\,\text{s} = \frac{501.28}{4.36\,\text{H/m} \cdot 3.9\,\text{kgf/m}^2}$$

11) Volume of Air Passed through Specimen Formula

Evaluate Formula

Formula

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

Example with Units

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

Variables used in list of Permeability Number Formulas above

- **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 in list of Permeability Number Formulas above

- 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

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