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Newton's Friction Postulation Formulas

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List of 9 Newton's Friction Postulation Formulas

Newton's Friction Postulation

1) Dynamic Viscosity given Kinematic Viscosity

Open Calculator

fx $\mu = v_s \cdot \rho_f$

ex $924\text{Pa*s} = 12\text{m}^2/\text{s} \cdot 77\text{kg}/\text{m}^3$

2) Dynamic Viscosity of Fluid given Fluid Filling Width between Plates

Open Calculator

fx $\mu = \frac{\sigma \cdot y}{V_f}$

ex $924\text{Pa*s} = \frac{18.48\text{Pa} \cdot 1000\text{mm}}{20\text{m/s}}$

3) Dynamic Viscosity of Fluid given Shear Force per Unit Area or Shear Stress

Open Calculator

fx $\mu = \frac{\sigma}{du/dy}$

ex $924\text{Pa*s} = \frac{18.48\text{Pa}}{0.02}$

4) Fluid Filling Width between Plates given Shear Force Per Unit Area or Shear Stress

Open Calculator

fx $$y = \frac{\mu \cdot V_f}{\sigma}$$

ex $$1000\text{mm} = \frac{924\text{Pa*s} \cdot 20\text{m/s}}{18.48\text{Pa}}$$

5) Mass Density of Fluid for given Kinematic Viscosity

Open Calculator

fx $$\rho_f = \frac{\mu}{v_s}$$

ex $$77\text{kg/m}^3 = \frac{924\text{Pa*s}}{12\text{m}^2/\text{s}}$$

6) Relationship between Dynamic Viscosity and Kinematic Viscosity

Open Calculator

fx $$v_s = \frac{\mu}{\rho_f}$$

ex $$12\text{m}^2/\text{s} = \frac{924\text{Pa*s}}{77\text{kg/m}^3}$$

7) Shear Force Per Unit Area or Shear Stress

Open Calculator

fx $$\sigma = \mu \cdot \text{du}/\text{dy}$$

ex $$18.48\text{Pa} = 924\text{Pa*s} \cdot 0.02$$

8) Velocity Gradient given Shear Force per unit Area or Shear Stress

Open Calculator

fx $$du_{/dy} = \frac{\sigma}{\mu}$$

ex $$0.02 = \frac{18.48\text{Pa}}{924\text{Pa*s}}$$

9) Velocity of Upper Plate given Shear force per unit Area or Shear Stress

Open Calculator

fx $$V_f = \frac{\sigma \cdot y}{\mu}$$

ex $$20\text{m/s} = \frac{18.48\text{Pa} \cdot 1000\text{mm}}{924\text{Pa*s}}$$

Variables Used

- $du_{/dy}$ Velocity Gradient
- V_f Velocity of Fluid *(Meter per Second)*
- v_s Kinematic Viscosity at 20° C *(Square Meter per Second)*
- **y** Width between the Plates *(Millimeter)*
- **μ** Dynamic Viscosity *(Pascal Second)*
- ρ_f Mass Density of Fluid *(Kilogram per Cubic Meter)*
- **σ** Shear Stress of Fluid *(Pascal)*

Constants, Functions, Measurements used

- Measurement: **Length** in Millimeter (mm)
  Length Unit Conversion
- Measurement: **Speed** in Meter per Second (m/s)
  Speed Unit Conversion
- Measurement: **Dynamic Viscosity** in Pascal Second (Pa*s)
  Dynamic Viscosity Unit Conversion
- Measurement: **Kinematic Viscosity** in Square Meter per Second (m^2/s)
  Kinematic Viscosity Unit Conversion
- Measurement: **Density** in Kilogram per Cubic Meter (kg/m^3)
  Density Unit Conversion
- Measurement: **Stress** in Pascal (Pa)
  Stress Unit Conversion

Check other formula lists

- **Newton's Friction Postulation Formulas**

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