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Direct Strains of Diagonal Formulas

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List of 11 Direct Strains of Diagonal Formulas

Direct Strains of Diagonal 🔗

1) Modulus of Rigidity using Young's Modulus and Poisson's Ratio 🔗

Open Calculator 🔗

fx $$G = \frac{E}{2 \cdot (1 + \nu)}$$

ex $$15\text{MPa} = \frac{39\text{MPa}}{2 \cdot (1 + 0.3)}$$

2) Poisson's ratio given tensile strain due to compressive stress in diagonal BD 🔗

Open Calculator 🔗

fx $$\nu = \frac{\varepsilon_{\text{diagonal}} \cdot E_{\text{bar}}}{\sigma_{\text{tp}}}$$

ex $$0.306557 = \frac{0.017 \cdot 11\text{MPa}}{0.61\text{MPa}}$$

3) Poisson's Ratio using Modulus of Rigidity 🔗

Open Calculator 🔗

fx $$\nu = \left(\frac{E}{2 \cdot G} \right) - 1$$

ex $$0.3 = \left(\frac{39\text{MPa}}{2 \cdot 15\text{MPa}} \right) - 1$$

4) Shear Strain in Diagonal given Tensile Strain for Square Block ⌷

fx $\eta = \left(2 \cdot \varepsilon_{\text{diagonal}}\right)$

ex $0.034 = \left(2 \cdot 0.017\right)$

5) Tensile strain in diagonal BD of square block ABCD due to compressive stress ⌷

fx $\varepsilon_{\text{tensile}} = \dfrac{\nu \cdot \sigma_t}{E_{\text{bar}}}$

ex $0.004091 = \dfrac{0.3 \cdot 0.15\text{MPa}}{11\text{MPa}}$

6) Tensile Strain in Diagonal given Shear Strain for Square Block ⌷

fx $\varepsilon_{\text{diagonal}} = \left(\dfrac{\eta}{2}\right)$

ex $0.017 = \left(\dfrac{0.034}{2}\right)$

7) Tensile Strain in Diagonal of Square Block due to Tensile Stress ⌷

fx $\varepsilon_{\text{tensile}} = \dfrac{\sigma_t}{E_{\text{bar}}}$

ex $0.013636 = \dfrac{0.15\text{MPa}}{11\text{MPa}}$

8) Total Compressive Strain in Diagonal AC of Square Block ABCD ⧉

Open Calculator ⧉

$$fx \quad \varepsilon_{\text{diagonal}} = \left(\frac{\sigma_t}{E_{\text{bar}}} \right) \cdot (1 + \nu)$$

$$ex \quad 0.017727 = \left(\frac{0.15 \text{MPa}}{11 \text{MPa}} \right) \cdot (1 + 0.3)$$

9) Total tensile strain in diagonal BD of square block ABCD given modulus of rigidity ⧉

Open Calculator ⧉

$$fx \quad \varepsilon_{\text{diagonal}} = \frac{\tau}{2 \cdot G}$$

$$ex \quad 0.017333 = \frac{0.52 \text{MPa}}{2 \cdot 15 \text{MPa}}$$

10) Total Tensile Strain in Diagonal of Square Block ⧉

Open Calculator ⧉

$$fx \quad \varepsilon_{\text{diagonal}} = \left(\frac{\sigma_t}{E_{\text{bar}}} \right) \cdot (1 + \nu)$$

$$ex \quad 0.017727 = \left(\frac{0.15 \text{MPa}}{11 \text{MPa}} \right) \cdot (1 + 0.3)$$

11) Young's Modulus using Modulus of Rigidity ⧉

Open Calculator ⧉

$$fx \quad E = 2 \cdot G \cdot (1 + \nu)$$

$$ex \quad 39 \text{MPa} = 2 \cdot 15 \text{MPa} \cdot (1 + 0.3)$$

Variables Used

- **E** Young's Modulus Bar *(Megapascal)*
- **E$_{bar}$** Modulus of Elasticity Of Bar *(Megapascal)*
- **G** Modulus of Rigidity of Bar *(Megapascal)*
- **ε$_{diagonal}$** Tensile Strain In Diagonal
- **ε$_{tensile}$** Tensile Strain
- **σ$_t$** Tensile Stress on Body *(Megapascal)*
- **σ$_{tp}$** Permissible Tensile Stress *(Megapascal)*
- **ν** Poisson's Ratio
- *η* Shear Strain
- *τ* Shear Stress in Body *(Megapascal)*

Constants, Functions, Measurements used

- Measurement: **Pressure** in Megapascal (MPa)
  Pressure Unit Conversion ⬈

- Measurement: **Stress** in Megapascal (MPa)
  Stress Unit Conversion ⬈

Check other formula lists

- **Direct Strains of Diagonal Formulas** ↗
- **Elastic Constants Formulas** ↗
- **Mohr's Circle Formulas** ↗
- **Principal Stresses and Strains Formulas** ↗

- **Relationship between Stress and Strain Formulas** ↗
- **Strain Energy Formulas** ↗
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