



Pin Formulas

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List of 13 Pin Formulas

Pin 🕑

1) Diameter of Knuckle Pin given Bending Moment in Pin 🚰

fx
$$\mathbf{d} = \left(\frac{32 \cdot M_{b}}{\pi \cdot \sigma_{b}}\right)^{\frac{1}{3}}$$

ex $37.06722 \text{mm} = \left(\frac{32 \cdot 450000 \text{N*mm}}{\pi \cdot 90 \text{N/mm}^{2}}\right)^{\frac{1}{3}}$

2) Diameter of Knuckle Pin given Bending Stress in Pin 子

$$\mathbf{fx} \mathbf{d} = \left(\frac{32 \cdot \frac{\mathrm{L}}{2} \cdot \left(\frac{\mathrm{b}}{4} + \frac{\mathrm{a}}{3}\right)}{\pi \cdot \sigma_{\mathrm{b}}}\right)^{\frac{1}{3}}$$
$$\mathbf{ex} 37.03115 \mathrm{mm} = \left(\frac{32 \cdot \frac{45000\mathrm{N}}{2} \cdot \left(\frac{44.3\mathrm{mm}}{4} + \frac{26.6\mathrm{mm}}{3}\right)}{\pi \cdot 90\mathrm{N/mm^2}}\right)^{\frac{1}{3}}$$



Open Calculator 🕑

Open Calculator

3) Diameter of Pin of Knuckle Joint given Compressive Stress in Eye End Portion of Pin

$$fx d = \frac{L}{\sigma_c \cdot b}$$
Open Calculator C

ex
$$33.86005$$
mm = $\frac{45000N}{30N/mm^2 \cdot 44.3mm}$

4) Diameter of Pin of Knuckle Joint given Compressive Stress in Fork End Portion of Pin

$$f_{X} d = \frac{L}{2 \cdot \sigma_{c} \cdot a}$$
Open Calculator C
$$28.19549 mm = \frac{45000N}{2 \cdot 30N/mm^{2} \cdot 26.6mm}$$

5) Diameter of Pin of Knuckle Joint given Diameter of Pinhead

fx
$$d = \frac{d_1}{1.5}$$

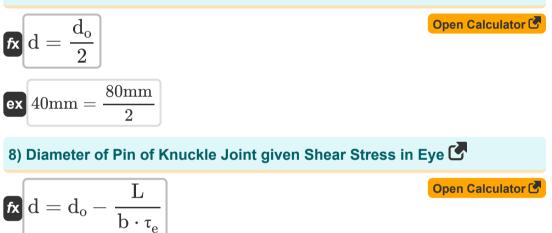
ex $40mm = \frac{60mm}{1.5}$



6) Diameter of Pin of Knuckle Joint given Load and Shear Stress in Pin

$$fx d = \sqrt{\frac{2 \cdot L}{\pi \cdot \tau_p}}$$
Open Calculator (*)
$$35.14005 \text{mm} = \sqrt{\frac{2 \cdot 45000 \text{N}}{\pi \cdot 23.2 \text{N/mm}^2}}$$

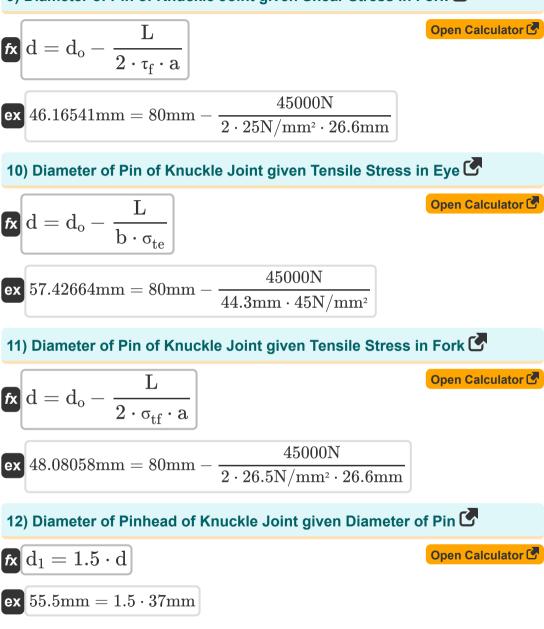
7) Diameter of Pin of Knuckle Joint given Outer Diameter of Eye



ex
$$37.67494$$
mm = 80 mm - $\frac{45000$ N}{44.3mm $\cdot 24$ N/mm²



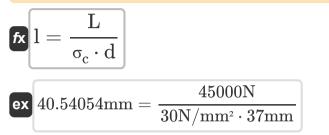
9) Diameter of Pin of Knuckle Joint given Shear Stress in Fork



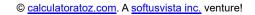


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13) Length of Pin of Knuckle Joint in Contact with Eye End 🕑







Open Calculator 🕑

Variables Used

- **a** Thickess of Fork Eye of Knuckle Joint (*Millimeter*)
- **b** Thickess of Eye of Knuckle Joint (Millimeter)
- d Diameter of Knuckle Pin (Millimeter)
- **d₁** Diameter of Knuckle Pin Head (*Millimeter*)
- **d**_o Outer Diameter of Eye of Knuckle Joint (*Millimeter*)
- Length of Knuckle Pin in Eye End (Millimeter)
- L Load on Knuckle Joint (Newton)
- Mb Bending Moment in Knuckle Pin (Newton Millimeter)
- σ_b Bending Stress in Knuckle Pin (Newton per Square Millimeter)
- σ_c Compressive Stress in Knuckle Pin (Newton per Square Millimeter)
- σ_{te} Tensile Stress in Eye of Knuckle Joint (Newton per Square Millimeter)
- σ_{tf} Tensile Stress in Fork of Knuckle Joint (Newton per Square Millimeter)
- Te Shear Stress in Eye of Knuckle Joint (Newton per Square Millimeter)
- Tf Shear Stress in Fork of Knuckle Joint (Newton per Square Millimeter)
- Tp Shear Stress in Knuckle Pin (Newton per Square Millimeter)



Constants, Functions, Measurements used

- Constant: pi, 3.14159265358979323846264338327950288 Archimedes' constant
- 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 Millimeter (mm) Length Unit Conversion
- Measurement: Force in Newton (N) Force Unit Conversion
- Measurement: Torque in Newton Millimeter (N*mm)
 Torque Unit Conversion
- Measurement: Stress in Newton per Square Millimeter (N/mm²) Stress Unit Conversion



Check other formula lists

• Eye Formulas 🗹

Pin Formulas C

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