Pin Formulas... 1/9





Pin Formulas

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List of 13 Pin Formulas

Pin 🚰

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



Open Calculator

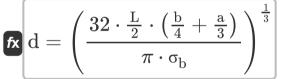
$$\mathbf{f}$$
 $\mathbf{d} = \left(rac{32\cdot M_b}{\pi \cdot \sigma_b}
ight)^{rac{1}{3}}$

ex
$$38.23545 \mathrm{mm} = \left(\frac{32 \cdot 450000 \mathrm{N^*mm}}{\pi \cdot 82 \mathrm{N/mm^2}} \right)^{\frac{1}{3}}$$

2) Diameter of Knuckle Pin given Bending Stress in Pin



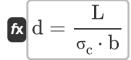
Open Calculator 2



$$= \left(\frac{32 \cdot \frac{50000 \mathrm{N}}{2} \cdot \left(\frac{40 \mathrm{mm}}{4} + \frac{26 \mathrm{mm}}{3} \right)}{\pi \cdot 82 \mathrm{N/mm^2}} \right)^{\frac{1}{3}}$$



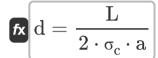
3) Diameter of Pin of Knuckle Joint given Compressive Stress in Eye End Portion of Pin



Open Calculator

$$=$$
 $rac{50000 ext{N}}{30 ext{N/mm}^2 \cdot 40 ext{mm}}$

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



Open Calculator

$$=$$
 $\frac{50000 ext{N}}{2 \cdot 30 ext{N/mm}^2 \cdot 26 ext{mm}}$

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

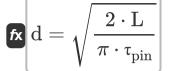
$$\mathbf{fx} d = \frac{d_1}{1.5}$$

Open Calculator 🗗

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



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



Open Calculator 🗗

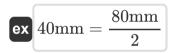
ex
$$37.04086 \mathrm{mm} = \sqrt{rac{2 \cdot 50000 \mathrm{N}}{\pi \cdot 23.2 \mathrm{N/mm^2}}}$$

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

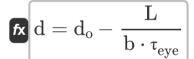


Open Calculator 2

$$\mathrm{fx} = rac{\mathrm{d_o}}{2}$$



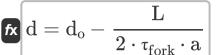




$$\mathbf{ex} = 27.91667 \mathrm{mm} = 80 \mathrm{mm} - \frac{50000 \mathrm{N}}{40 \mathrm{mm} \cdot 24 \mathrm{N/mm^2}}$$



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

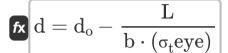


Open Calculator 2

 $= 2.53846 \, \mathrm{mm} = 80 \, \mathrm{mm} - \frac{2.25 \, \mathrm{mm}}{2.25 \, \mathrm{mm}}$

10) Diameter of Pin of Knuckle Joint given Tensile Stress in Eye

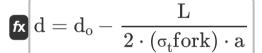
50000N



Open Calculator

50000N $\overline{40 \mathrm{mm} \cdot 45} \mathrm{N/mm^2}$

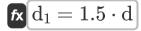
11) Diameter of Pin of Knuckle Joint given Tensile Stress in Fork



Open Calculator G

 $= 43.71553 \mathrm{mm} = 80 \mathrm{mm} - \frac{500001}{2 \cdot 26.5 \mathrm{N/mm^2 \cdot 26 mm}}$

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



Open Calculator



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



Open Calculator

$$l = rac{L}{\sigma_{
m c} \cdot {
m d}}$$

$$=$$
 $45.04505 ext{mm} = rac{50000 ext{N}}{30 ext{N/mm}^2 \cdot 37 ext{mm}}$



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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)
- **d**₁ Diameter of Knuckle Pin Head (Millimeter)
- **d**_o Outer Diameter of Eye of Knuckle Joint (*Millimeter*)
- I Length of Knuckle Pin in Eye End (Millimeter)
- L Load on Knuckle Joint (Newton)
- M_h 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_teye Tensile Stress in Eye of Knuckle Joint (Newton per Square Millimeter)
- σ_tfork Tensile Stress in Fork of Knuckle Joint (Newton per Square Millimeter)
- Teve Shear Stress in Eye of Knuckle Joint (Newton per Square Millimeter)
- Tfork Shear Stress in Fork of Knuckle Joint (Newton per Square Millimeter)
- Tpin Shear Stress in Knuckle Pin (Newton per Square Millimeter)





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Constants, Functions, Measurements used

- Constant: pi, 3.14159265358979323846264338327950288
 Archimedes' constant
- Function: sqrt, sqrt(Number) Square root function
- 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





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Check other formula lists

• Eye Formulas



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