



Design of Cotter Joint Formulas

Calculators!

Examples!

Conversions!

Bookmark calculatoratoz.com, unitsconverters.com

Widest Coverage of Calculators and Growing - 30,000+ Calculators! Calculate With a Different Unit for Each Variable - In built Unit Conversion! Widest Collection of Measurements and Units - 250+ Measurements!

Feel free to SHARE this document with your friends!

Please leave your feedback here...





List of 51 Design of Cotter Joint Formulas Design of Cotter Joint 🕝 Forces and Loads on Joint 1) Force on Cotter given Shear Stress in Cotter 🖸 Open Calculator fx $\mathrm{L}=2\cdot\mathrm{t_c}\cdot\mathrm{b}\cdot\mathrm{ au_{co}}$ ex $50000.78N = 2 \cdot 21.478mm \cdot 48.5mm \cdot 24N/mm^2$ 2) Load Taken by Cotter Joint Rod given Tensile Stress in Rod 🕑 Open Calculator $\mathbf{f_X} \mathrm{L} = rac{\pi \cdot \mathrm{d}^2 \cdot \mathrm{\sigma t_{rod}}}{4}$ ex 50000.61N = $\frac{\pi \cdot (35.6827 \text{mm})^2 \cdot 50 \text{N/mm}^2}{4}$ 3) Load Taken by Socket of Cotter Joint given Compressive Stress fx $L = \sigma_{cso} \cdot (d_4 - d_2) \cdot t_c$ Open Calculator ex 50000.78N = 58.20N/mm² · (80mm - 40mm) · 21.478mm 4) Load Taken by Socket of Cotter Joint given Shear Stress in Socket 🖌 Open Calculator fx $L = 2 \cdot (d_4 - d_2) \cdot c \cdot \tau_{so}$ ex $50000N = 2 \cdot (80mm - 40mm) \cdot 25.0mm \cdot 25N/mm^2$ 5) Load Taken by Socket of Cotter Joint given Tensile Stress in Socket 💪 Open Calculator $\mathbf{fx} = (\sigma_t so) \cdot \left(rac{\pi}{4} \cdot \left(d_1^2 - d_2^2 ight) - t_c \cdot (d_1 - d_2) ight)$ ex $50000.82 \mathrm{N} = 68.224 \mathrm{N/mm^2} \cdot \left(rac{\pi}{4} \cdot \left((54 \mathrm{mm})^2 - (40 \mathrm{mm})^2 ight) - 21.478 \mathrm{mm} \cdot (54 \mathrm{mm} - 40 \mathrm{mm}) ight)$



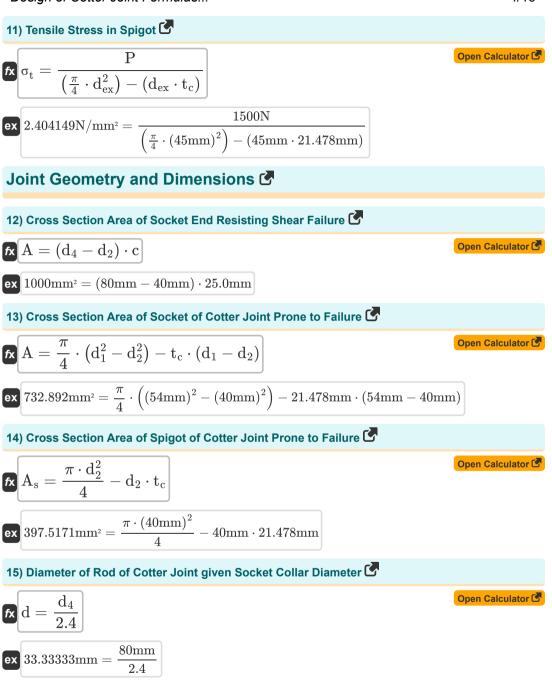


6) Load Taken by Spigot of Cotter Joint given Compressive Stress in Spigot Considering Crushing Failure

KL = t_c · d_2 ·
$$\sigma_{c1}$$
Open Catculator (*)(*)L = t_c · d_2 · σ_{c1} Open Catculator (*)(*)L = 2 · L_a · d_2 · τ_{sp} Open Catculator (*)(*)L = 2 · L_a · d_2 · τ_{sp} Open Catculator (*)(*)L = 2 · L_a · d_2 · τ_{sp} Open Catculator (*)(*)S 50000.48N = 2 · 23.5mm · 40mm · 26.596N/mm²Open Catculator (*)(*)S 50000.48N = 2 · 23.5mm · 40mm · 26.596N/mm²Open Catculator (*)(*)L = $\left(\frac{\pi}{4} \cdot d_2^2 - d_2 \cdot t_c\right) \cdot (\sigma_t sp)$ Open Catculator (*)(*)L = $\left(\frac{\pi}{4} \cdot d_2^2 - d_2 \cdot t_c\right) \cdot (\sigma_t sp)$ Open Catculator (*)(*)S 50000.89N = $\left(\frac{\pi}{4} \cdot (40mm)^2 - 40mm · 21.478mm\right) \cdot 125.783N/mm²$ Open Catculator (*)(*)T_p = $\frac{P}{2 \cdot b \cdot t_c}$ Open Catculator (*)(*)T_p = $\frac{1500N}{2 \cdot 48.5mm \cdot 21.478mm}$ Open Catculator (*)(*)T_p = $\frac{P}{2 \cdot a \cdot d_{ex}}$ Open Catculator (*)(*)T_p = $\frac{P}{2 \cdot a \cdot d_{ex}}$ Open Catculator (*)(*)T_p = $\frac{P}{2 \cdot a \cdot d_{ex}}$ Open Catculator (*)(*)S $\tau_p = \frac{P}{2 \cdot a \cdot d_{ex}}$ Open Catculator (*)(*)S $\tau_p = \frac{P}{2 \cdot a \cdot d_{ex}}$ Open Catculator (*)(*)S $\tau_p = \frac{1500N}{2 \cdot 17.4mm \cdot 45mm}$ Open Catculator (*)











16) Diameter of Rod of Cotter Joint given Spigot Collar Diameter 🕑

$$d = \frac{d_3}{1.5}$$
(c)
$$d = \frac{d_3}{1.5}$$
(c)
$$d = \frac{48mm}{1.5}$$
(c)
$$d = \frac{48mm}{1.5}$$
(c)
$$d = \frac{t_c}{0.31}$$
(c)
$$d = \frac{t_c}{0.31}$$
(c)
$$d = \frac{t_c}{0.31}$$
(c)
$$d = \frac{t_1}{0.31}$$
(c)
$$d = \frac{t_1}{0.45}$$
(c)

fx
$$d_4 = 2.4 \cdot d$$

ex 85.63848mm = $2.4 \cdot 35.6827$ mm

20) Diameter of Socket Collar of Cotter Joint given Bending Stress in Cotter 🚰

$$fx d_4 = \frac{4 \cdot b^2 \cdot \sigma_b \cdot \frac{t_c}{L} - d_2}{2}$$

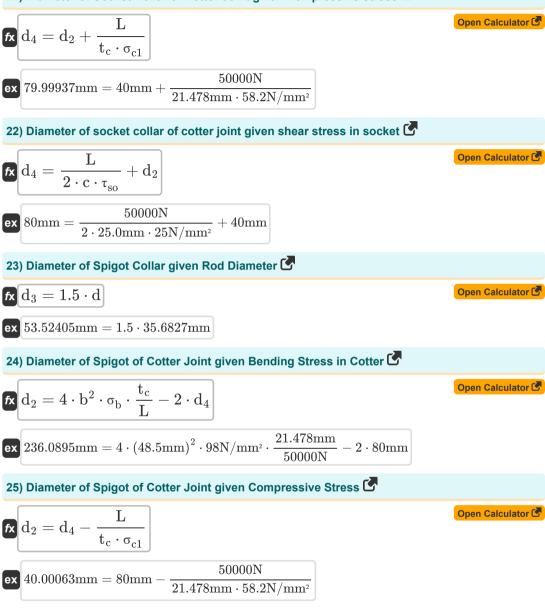
$$ex 178.0448 \text{mm} = \frac{4 \cdot (48.5 \text{mm})^2 \cdot 98 \text{N/mm}^2 \cdot \frac{21.478 \text{mm}}{50000 \text{N}} - 40 \text{mm}}{2}$$

$$Open Calculator Constraints of the second se$$



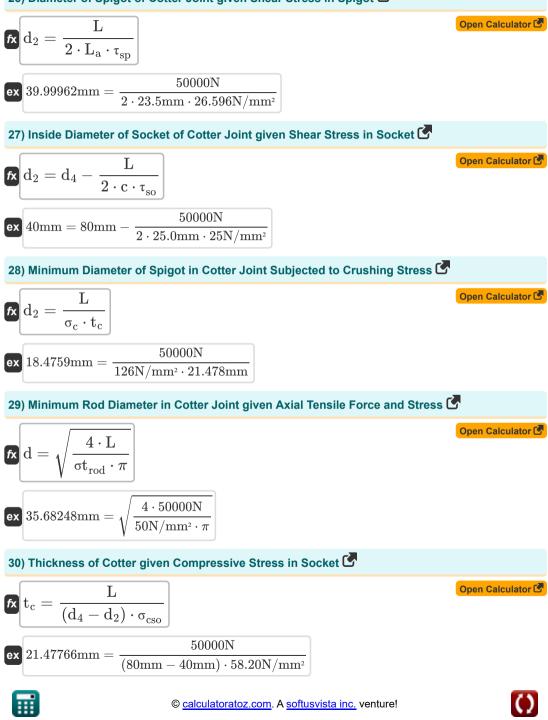
Open Calculator 🗗

21) Diameter of Socket Collar of Cotter Joint given Compressive Stress 🕻





26) Diameter of Spigot of Cotter Joint given Shear Stress in Spigot 🕑



31) Thickness of Cotter given Compressive Stress in Spigot 🖸



шi

36) Thickness of Spigot Collar when Rod Diameter is Available 🕑

© calculatoratoz.com. A softusvista inc. venture!



41) Compressive Stress in Spigot of Cotter Joint Considering Crushing Failure



46) Shear Stress in Socket of Cotter Joint given Inner and Outer Diameter of Socket 🕑

()

51) Tensile Stress in Spigot of Cotter Joint given Diameter of Spigot, Thickenss of Cotter and Load

$$\begin{aligned} \mathbf{fx} & \left(\sigma_{t} sp\right) = \frac{L}{\frac{\pi \cdot d_{2}^{2}}{4} - d_{2} \cdot \mathbf{t}_{c}} \end{aligned}$$

$$\begin{aligned} \mathbf{ex} & 125.7808N/mm^{2} = \frac{50000N}{\frac{\pi \cdot (40mm)^{2}}{4} - 40mm \cdot 21.478mm} \end{aligned}$$





Open Calculator 🕑

Variables Used

- a Spigot Distance (Millimeter)
- A Cross Sectional Area of Socket (Square Millimeter)
- As Cross Sectional Area of Spigot (Square Millimeter)
- **b** Mean Width of Cotter (*Millimeter*)
- C Axial Distance From Slot to End of Socket Collar (Millimeter)
- d Diameter of Rod of Cotter Joint (Millimeter)
- d1 Outside Diameter of Socket (Millimeter)
- d₂ Diameter of Spigot (Millimeter)
- **d**₃ Diameter of Spigot Collar (Millimeter)
- **d**₄ Diameter of Socket Collar (*Millimeter*)
- dex External Diameter of Spigot (Millimeter)
- D_s Spigot Diameter (Millimeter)
- F_c Force on Cotter Joint (Newton)
- L Load on Cotter Joint (Newton)
- La Gap between End of Slot to End of Spigot (Millimeter)
- P Tensile Force on Rods (Newton)
- t₁ Thickness of Spigot Collar (Millimeter)
- t_c Thickness of Cotter (Millimeter)
- V Shear Force on Cotter (Newton)
- σ_b Bending Stress in Cotter (Newton per Square Millimeter)
- σ_c Crushing Stress induced in Cotter (Newton per Square Millimeter)
- σ_{c1} Compressive Stress in Spigot (Newton per Square Millimeter)
- σ_{cp} Stress in Spigot (Newton per Square Millimeter)
- σ_{cso} Compressive Stress In Socket (Newton per Square Millimeter)
- σ_t Tensile Stress (Newton per Square Millimeter)
- σ_tso Tensile Stress In Socket (Newton per Square Millimeter)
- σ_tsp Tensile Stress In Spigot (Newton per Square Millimeter)
- σt_{rod} Tensile Stress in Cotter Joint Rod (Newton per Square Millimeter)

- T_{CO} Shear Stress in Cotter (Newton per Square Millimeter)
- T_{SO} Shear Stress in Socket (Newton per Square Millimeter)
- T_{sp} Shear Stress in Spigot (Newton per Square Millimeter)
- τ_p Permissible Shear Stress (Newton per Square Meter)

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: Area in Square Millimeter (mm²) Area Unit Conversion
- Measurement: **Pressure** in Newton per Square Meter (N/m²) Pressure Unit Conversion
- Measurement: Force in Newton (N) Force Unit Conversion
- Measurement: Stress in Newton per Square Millimeter (N/mm²) Stress Unit Conversion





Check other formula lists Riveted Joints Formulas Design of Cotter Joint Formulas Seals Formulas

- Design of Knuckle Joint Formulas
- Packing Formulas
- Retaining Rings and Circlips Formulas

Threaded Bolted Joints Formulas

Welded Joints Formulas

Feel free to SHARE this document with your friends!

PDF Available in

English Spanish French German Russian Italian Portuguese Polish Dutch

7/22/2024 | 5:37:04 AM UTC

Please leave your feedback here ...





