



Maximum Bending Stress in Spring Formulas

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List of 17 Maximum Bending Stress in Spring Formulas

Maximum Bending Stress in Spring 🗗

At Proof Load

1) Deflection given Maximum Bending Stress at Proof Load of Leaf Spring

$$\delta = rac{ ext{f}_{ ext{proof load}} \cdot ext{L}^2}{4 \cdot ext{t} \cdot ext{E}}$$

Open Calculator 🗗

- $= \frac{7.2 \text{MPa} \cdot (4170 \text{mm})^2}{4 \cdot 460 \text{mm} \cdot 20000 \text{MPa}}$
- 2) Length given Maximum Bending Stress at Proof Load of Leaf Spring 🖒

$$ext{L} = \sqrt{rac{4 \cdot ext{t} \cdot ext{E} \cdot \delta}{ ext{f}_{ ext{proof load}}}}$$

Open Calculator



3) Maximum Bending Stress at Proof Load of Leaf Spring

 $\mathbf{f}_{ ext{proof load}} = rac{4 \cdot \mathbf{t} \cdot \mathbf{E} \cdot \mathbf{\delta}}{\mathrm{L}^2}$

Open Calculator

4) Modulus of Elasticity given Maximum Bending Stress at Proof Load of Leaf Spring

 $\mathbf{E} = rac{\mathrm{f}_{\mathrm{proof\ load}} \cdot \mathrm{L}^2}{4 \cdot \mathrm{t} \cdot \delta}$

Open Calculator

 $ext{ex} \left[20012.8 ext{MPa} = rac{7.2 ext{MPa} \cdot (4170 ext{mm})^2}{4 \cdot 460 ext{mm} \cdot 3.4 ext{mm}}
ight]$

5) Thickness given Maximum Bending Stress at Proof Load of Leaf Spring

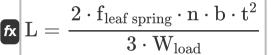
 $t = rac{\mathrm{f}_{\mathrm{proof \, load}} \cdot \mathrm{L}^2}{4 \cdot \mathrm{E} \cdot \delta}$

 $= \frac{7.2 \text{MPa} \cdot (4170 \text{mm})^2}{4 \cdot 20000 \text{MPa} \cdot 3.4 \text{mm}}$



Leaf Springs 🗗

6) Length given Maximum Bending Stress of Leaf Spring



Open Calculator

$$= \frac{2 \cdot 1047 \text{Pa} \cdot 8 \cdot 300 \text{mm} \cdot (460 \text{mm})^2}{3 \cdot 85 \text{N}}$$

7) Load given Maximum Bending Stress of Leaf Spring

$$extbf{W}_{ ext{load}} = rac{2 \cdot ext{f}_{ ext{leaf spring}} \cdot ext{n} \cdot ext{b} \cdot ext{t}^2}{3 \cdot ext{L}}$$

Open Calculator 🗗

8) Maximum Bending Stress of Leaf Spring

$$\mathbf{f}_{ ext{leaf spring}} = rac{3 \cdot \mathrm{W}_{\mathrm{load}} \cdot \mathrm{L}}{2 \cdot \mathrm{n} \cdot \mathrm{b} \cdot \mathrm{t}^2}$$

Open Calculator 🗗



9) Number of Plates given Maximum Bending Stress of Leaf Spring

 $ext{n} = rac{3 \cdot ext{W}_{ ext{load}} \cdot ext{L}}{2 \cdot ext{f}_{ ext{leaf spring}} \cdot ext{b} \cdot ext{t}^2}$

Open Calculator 🗗

10) Thickness given Maximum Bending Stress of Leaf Spring

 $t = \sqrt{rac{3 \cdot W_{load} \cdot L}{2 \cdot n \cdot b \cdot f_{leaf \; spring}}}$

Open Calculator

 $= \sqrt{\frac{3 \cdot 85 \text{N} \cdot 4170 \text{mm}}{2 \cdot 8 \cdot 300 \text{mm} \cdot 1047 \text{Pa}} }$

11) Width given Maximum Bending Stress of Leaf Spring

 $ext{b} = rac{3 \cdot ext{W}_{ ext{load}} \cdot ext{L}}{2 \cdot ext{n} \cdot ext{f}_{ ext{leaf spring}} \cdot ext{t}^2}$

Open Calculator

 $= \frac{3 \cdot 85 \text{N} \cdot 4170 \text{mm}}{2 \cdot 8 \cdot 1047 \text{Pa} \cdot (460 \text{mm})^2}$

Quarter Elliptical Springs 🗗

12) Length given Maximum Bending Stress in Quarter Elliptical Spring 🗗

 $L = rac{f_{
m elliptical \, spring} \cdot n \cdot b \cdot t^2}{6 \cdot W_{
m load}}$

Open Calculator

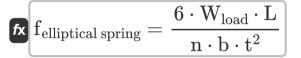
 $extbf{ex} = rac{4187.736 ext{Pa} \cdot 8 \cdot 300 ext{mm} \cdot 460 ext{mm}^2}{6 \cdot 85 ext{N}}$

13) Load given Maximum Bending Stress in Quarter Elliptical Spring

 $W_{load} = rac{f_{elliptical \, spring} \cdot n \cdot b \cdot t^2}{6 \cdot L}$

Open Calculator

14) Maximum Bending Stress in Quarter Elliptical Spring



Open Calculator 🗗



15) Number of Plates given Maximum Bending Stress in Quarter Elliptical Spring

 $n = rac{6 \cdot W_{load} \cdot L}{f_{elliptical \; spring} \cdot b \cdot t^2}$

Open Calculator 🗗

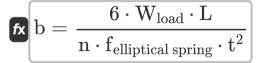
16) Thickness given Maximum Bending Stress in Quarter Elliptical Spring

 $t = \sqrt{rac{6 \cdot W_{load} \cdot L}{n \cdot b \cdot f_{elliptical \; spring}}}$

Open Calculator

ex $460 \text{mm} = \sqrt{\frac{6 \cdot 85 \text{N} \cdot 4170 \text{mm}}{8 \cdot 300 \text{mm} \cdot 4187.736 \text{Pa}}}$

17) Width given Maximum Bending Stress in Quarter Elliptical Spring 🗗



Open Calculator



Variables Used

- **b** Width of Cross Section (Millimeter)
- E Young's Modulus (Megapascal)
- felliptical spring Maximum Bending Stress in Elliptical Spring (Pascal)
- fleaf spring Maximum Bending Stress in Leaf Spring (Pascal)
- **f**_{proof load} Maximum Bending Stress at Proof Load (*Megapascal*)
- L Length in Spring (Millimeter)
- n Number of Plates
- **t** Thickness of Section (Millimeter)
- W_{load} Spring Load (Newton)
- δ Deflection of Spring (Millimeter)





Constants, Functions, Measurements used

- Function: sqrt, sqrt(Number)
 Square root function
- Measurement: Length in Millimeter (mm)
 Length Unit Conversion
- Measurement: Force in Newton (N)
 Force Unit Conversion
- Measurement: Stress in Megapascal (MPa), Pascal (Pa)
 Stress Unit Conversion





Check other formula lists

Deflection in Spring Formulas • Maximum Bending Stress in Spring Formulas •

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