



# Transverse Fillet Weld Formulas

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### List of 16 Transverse Fillet Weld Formulas

### Transverse Fillet Weld

1) Allowable Load per mm Length of Transverse Fillet Weld



fx  $P_{\rm a}=0.8284\cdot {
m h_l}\cdot au_{
m max}$ 

Open Calculator 2

- 2) Force Acting given Shear Stress-induced in Plane that is Inclined at angle theta

$$ag{P_{
m d} = rac{ au \cdot 
m h_l \cdot L}{\sin( heta) \cdot (\sin( heta) + \cos( heta))}}$$

Open Calculator 🖸

- 3) Leg of Weld given Allowable Lod per mm Length of Transverse Fillet Weld

Open Calculator

ex 
$$21.0563 \mathrm{mm} = rac{1378 \mathrm{N/mm}}{0.8284 \cdot 79 \mathrm{N/mm^2}}$$



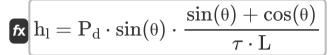
### 4) Leg of Weld given Maximum Shear Stress-induced in Plane



Open Calculator 🗗

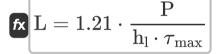
$$= 21.10608 \mathrm{mm} = 1.21 \cdot \frac{1378 \mathrm{N/mm}}{79 \mathrm{N/mm^2}}$$

5) Leg of Weld given Shear Stress-induced in Plane



Open Calculator

### 6) Length of Weld given Maximum Shear Stress-induced in Plane



Open Calculator 🗗

ex 
$$194.1289 \mathrm{mm} = 1.21 \cdot \frac{268.7 \mathrm{kN}}{21.2 \mathrm{mm} \cdot 79 \mathrm{N/mm^2}}$$



## 7) Length of Weld given Shear Stress-induced in Plane that is inclined at Angle theta

 $\mathbf{E} = \mathrm{P_d} \cdot \sin( heta) \cdot rac{\sin( heta) + \cos( heta)}{ au \cdot \mathrm{h_l}}$ 

Open Calculator

 $= 26.87 \text{kN} \cdot \sin(45\degree) \cdot \frac{\sin(45\degree) + \cos(45\degree)}{6.5 \text{N/mm}^2 \cdot 21.2 \text{mm}}$ 

### 8) Length of weld given Tensile Stress in Transverse Fillet Weld

 $\mathbf{E} = rac{P_{t}}{0.707 \cdot h_{l} \cdot \sigma_{t}}$ 

Open Calculator

 $= \frac{165.5 \text{kN}}{0.707 \cdot 21.2 \text{mm} \cdot 56.4 \text{N/mm}^2}$ 

9) Maximum Shear Stress-induced given Allowable Load per mm length of Transverse Fillet Weld

 $au_{
m max} = rac{
m P_a}{0.8284 \cdot 
m h_l}$ 

Open Calculator 🗗

 $ext{ex} 78.46451 ext{N/mm}^2 = rac{1378 ext{N/mm}}{0.8284 \cdot 21.2 ext{mm}}$ 



### 10) Maximum Shear Stress-induced in Plane that is Inclined at Angle theta

 $au_{
m max} = 1.21 \cdot rac{
m P}{
m h_l \cdot L}$ 

Open Calculator 🚰

 $ext{ex} \ 78.64707 ext{N}/ ext{mm}^2 = 1.21 \cdot rac{268.7 ext{kN}}{21.2 ext{mm} \cdot 195 ext{mm}}$ 

### 11) Permissible Tensile Strength for Double Transverse Fillet Joint

 $\left|\mathbf{\sigma}_{\mathrm{t}}
ight|=rac{\mathrm{P}}{1.414\cdot\mathrm{L}\cdot\mathrm{L}}$ 

Open Calculator

 $\mathbf{ex} = \frac{268.7 \mathrm{kN}}{1.414 \cdot 195 \mathrm{mm} \cdot 195 \mathrm{mm}}$ 

# 12) Shear Stress-Induced in Plane that is inclined at Angle theta to Horizontal

 $au = \mathrm{P_d} \cdot \sin( heta) \cdot rac{\sin( heta) + \cos( heta)}{\mathrm{h_l} \cdot \mathrm{L}}$ 

Open Calculator 🖸

 $= 26.87 \mathrm{kN} \cdot \sin(45°) \cdot \frac{\sin(45°) + \cos(45°)}{21.2 \mathrm{mm} \cdot 195 \mathrm{mm}}$ 

### 13) Tensile Force on Plates given Tensile Stress in Transverse Fillet Weld

fx  $P_{t} = \sigma_{t} \cdot 0.707 \cdot h_{l} \cdot L$ 

Open Calculator 🗗

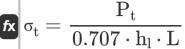
 $\mathbf{ex} \ 164.8424 \mathrm{kN} = 56.4 \mathrm{N/mm^2 \cdot 0.707 \cdot 21.2 mm \cdot 195 mm}$ 







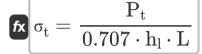
### 14) Tensile Stress in Transverse Fillet Weld



Open Calculator

$$ext{ex} egin{aligned} 56.62499 ext{N/mm}^2 &= rac{165.5 ext{kN}}{0.707 \cdot 21.2 ext{mm} \cdot 195 ext{mm}} \end{aligned}$$

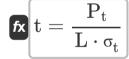
### 15) Tensile Stress in Transverse Fillet Weld given Leg of Weld



Open Calculator

$$ext{ex} \ 56.62499 ext{N/mm}^2 = rac{165.5 ext{kN}}{0.707 \cdot 21.2 ext{mm} \cdot 195 ext{mm}}$$

### 16) Thickness of Plate given Tensile Stress in Transverse Fillet Weld



Open Calculator 🗗

$$ext{ex} 15.04819 ext{mm} = rac{165.5 ext{kN}}{195 ext{mm} \cdot 56.4 ext{N/mm}^2}$$



### Variables Used

- **h**<sub>I</sub> Leg of Weld (Millimeter)
- L Length of Weld (Millimeter)
- P Load on Weld (Kilonewton)
- Pa Load per Unit Length in Transverse Fillet Weld (Newton per Millimeter)
- Pd Load on Double Transverse Fillet Weld (Kilonewton)
- Pt Load on Transverse Fillet Weld (Kilonewton)
- t Thickness of Transverse Fillet Welded Plate (Millimeter)
- **0** Weld Cut Angle (Degree)
- σ<sub>t</sub> Tensile Stress in Transverse Fillet Weld (Newton per Square Millimeter)
- τ Shear Stress in Transverse Fillet Weld (Newton per Square Millimeter)
- τ<sub>max</sub> Maximum Shear Stress in Transverse Fillet Weld (Newton per Square Millimeter)





### Constants, Functions, Measurements used

- Function: cos, cos(Angle)

  Cosine of an angle is the ratio of the side adjacent to the angle to the hypotenuse of the triangle.
- Function: sin, sin(Angle)

  Sine is a trigonometric function that describes the ratio of the length of the opposite side of a right triangle to the length of the hypotenuse.
- Measurement: Length in Millimeter (mm)
   Length Unit Conversion
- Measurement: Force in Kilonewton (kN)
   Force Unit Conversion
- Measurement: Angle in Degree (°)
   Angle Unit Conversion
- Measurement: Surface Tension in Newton per Millimeter (N/mm)
   Surface Tension Unit Conversion
- Measurement: Stress in Newton per Square Millimeter (N/mm²)
   Stress Unit Conversion





### **Check other formula lists**

- Butt Welds Formulas
- Parallel Fillet Welds Formulas Formulas
- Transverse Fillet Weld

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