



# **Parallel Fillet Welds Formulas**

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#### **List of 15 Parallel Fillet Welds Formulas**

### Parallel Fillet Welds

1) Allowable Load in Parallel Fillet Weld per Unit Length



fx  $P_{
m a}=0.707\cdot au\cdot h_{
m l}$ 

Open Calculator 2

 $= 569.5592 \mathrm{N/mm} = 0.707 \cdot 38 \mathrm{N/mm^2 \cdot 21.2mm}$ 

2) Force in Parallel Fillet Weld given Shear Stress 🛂

Open Calculator

 $ext{P}_{ ext{f}} = au \cdot ext{L} \cdot rac{ ext{h}_{ ext{l}}}{\sin( heta) + \cos( heta)}$ 

21.2mm  $ext{ex} \ 111080.8 ext{N} = 38 ext{N/mm}^2 \cdot 195 ext{mm} \cdot rac{21.2 ext{mm}}{\sin(45\degree) + \cos(45\degree)}$ 

3) Leg of Parallel Fillet Weld given Shear Stress

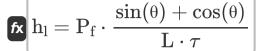
 $\mathbf{f}_{\mathbf{k}} egin{aligned} \mathbf{h}_{\mathrm{l}} &= rac{\mathrm{P_{f}}}{ au \cdot \mathrm{L} \cdot \mathrm{cos} \left(rac{\pi}{4}
ight)} \end{aligned}$ 

Open Calculator G

111080N21.19984mm = - $38\text{N/mm}^2 \cdot 195\text{mm} \cdot \cos\left(\frac{\pi}{4}\right)$ 

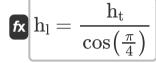


## 4) Leg of Parallel Fillet Weld given Shear Stress and Weld Cut Angle



Open Calculator

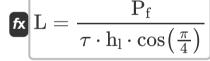
## 5) Leg of Parallel Fillet Weld given Throat of Weld



Open Calculator

 $= 21.2132 \text{mm} = \frac{15 \text{mm}}{\cos\left(\frac{\pi}{4}\right)}$ 

## 6) Length of Parallel Fillet Weld given Shear Stress



Open Calculator

 $194.9986 \text{mm} = \frac{111080 \text{N}}{38 \text{N/mm}^2 \cdot 21.2 \text{mm} \cdot \cos(\frac{\pi}{4})}$ 

# $ag{L} = ext{P}_{ ext{f}} \cdot rac{\sin( heta) + \cos( heta)}{ ext{h}_{ ext{l}} \cdot au}$



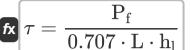
 $ext{ex} 194.9986 ext{mm} = 111080 ext{N} \cdot rac{\sin(45\degree) + \cos(45\degree)}{21.2 ext{mm} \cdot 38 ext{N/mm}^2}$ 



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### 8) Maximum Shear Stress in Parallel Fillet Weld given Load 🖸



Open Calculator

$$ext{ex} \ 38.00546 ext{N/mm}^2 = rac{111080 ext{N}}{0.707 \cdot 195 ext{mm} \cdot 21.2 ext{mm}}$$

## 9) Shear Stress in Double Parallel Fillet Weld

$$au$$
  $au = rac{ ext{P}_{ ext{dp}}}{0.707 \cdot ext{L} \cdot ext{h}_{ ext{l}}}$ 

Open Calculator

ex 
$$188.1797$$
Pa =  $\frac{0.55\text{N}}{0.707 \cdot 195\text{mm} \cdot 21.2\text{mm}}$ 

## 10) Shear Stress in Parallel Fillet Weld

fx 
$$au = rac{ ext{P}_{ ext{f}}}{0.707 \cdot ext{L} \cdot ext{h}_{ ext{l}}}$$

Open Calculator

$$ext{ex} oxed{38.00546 ext{N/mm}^2 = rac{111080 ext{N}}{0.707 \cdot 195 ext{mm} \cdot 21.2 ext{mm}}}$$

#### 11) Shear Stress in Parallel Fillet Weld given Load

$$au = ext{P}_{ ext{f}} \cdot rac{\sin( heta) + \cos( heta)}{ ext{L} \cdot ext{h}_{ ext{l}}}$$

Open Calculator 🗗

$$extbf{L} \cdot ext{h}_{ ext{l}} ext{ } ext{sin}(45\degree) + ext{cos}(45\degree) +$$

$$ext{ex} \left[ 37.99972 ext{N/mm}^2 = 111080 ext{N} \cdot rac{\sin(45°) + \cos(45°)}{195 ext{mm} \cdot 21.2 ext{mm}} 
ight]$$





#### 12) Shear Stress Parallel Fillet Weld

 $au = rac{ ext{P}_{ ext{f}}}{ ext{L} \cdot ext{h}_{ ext{l}} \cdot ext{cos} \left(rac{\pi}{4}
ight)}$ 

Open Calculator

 $L \cdot n_l \cdot \cos\left(\frac{\pi}{4}\right)$ 

=  $37.99972 \mathrm{N/mm^2} = rac{111080 \mathrm{N}}{195 \mathrm{mm} \cdot 21.2 \mathrm{mm} \cdot \cos \left( rac{\pi}{4} 
ight)}$ 

# 13) Tensile Force on Parallel Fillet Weld Plate given Shear Stress

fx  $P_{
m f} = au \cdot {
m L} \cdot {
m h_l} \cdot 0.707$ 

Open Calculator

 $ext{ex} \ 111064 ext{N} = 38 ext{N/mm}^2 \cdot 195 ext{mm} \cdot 21.2 ext{mm} \cdot 0.707$ 

#### 14) Throat of Parallel Fillet Weld

 $\mathbf{h}_{\mathrm{t}} = \mathrm{h}_{\mathrm{l}} \cdot \mathrm{cos} \Big( rac{\pi}{4} \Big)$ 

Open Calculator 🗗

 $\boxed{14.99066 \mathrm{mm} = 21.2 \mathrm{mm} \cdot \mathrm{cos} \Big(\frac{\pi}{4}\Big)}$ 

## 15) Width of Plane in Double Parallel Fillet Weld

 $ag{t'} = rac{ ext{h}_{ ext{l}}}{\sin( heta) + \cos( heta)}$ 

Open Calculator 🗗

 $ext{ex} oxed{14.99066 ext{mm}} = rac{21.2 ext{mm}}{\sin(45\degree) + \cos(45\degree)}$ 



#### Variables Used

- **h**<sub>I</sub> Leg of Weld (Millimeter)
- h<sub>t</sub> Throat Thickness of Weld (Millimeter)
- L Length of Weld (Millimeter)
- L Length of Weld (Millimeter)
- Pa Allowable Load Per Unit Length of Weld (Newton per Millimeter)
- P<sub>dp</sub> Load on Double Parallel Fillet Weld (Newton)
- P<sub>f</sub> Load on Parallel Fillet Weld (Newton)
- t' Plane Width in Double Parallel Fillet Weld (Millimeter)
- θ Weld Cut Angle (Degree)
- τ Shear Stress in Parallel Fillet Weld (Newton per Square Millimeter)
- τ Shearing Stress (Pascal)





### Constants, Functions, Measurements used

- Constant: pi, 3.14159265358979323846264338327950288
   Archimedes' constant
- 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: Pressure in Newton per Square Millimeter (N/mm²)
   Pressure Unit Conversion
- Measurement: Force in Newton (N)
   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 Pascal (Pa)
   Stress Unit Conversion





#### **Check other formula lists**

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

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