

Important Transverse Fillet Weld Formulas PDF



**Formulas
Examples
with Units**

List of 16 Important Transverse Fillet Weld Formulas

1) Allowable Load per mm Length of Transverse Fillet Weld Formula

Formula

$$P_a = 0.8284 \cdot h_1 \cdot \tau_{\max}$$

Example with Units

$$1387.4043 \text{ N/mm} = 0.8284 \cdot 21.2 \text{ mm} \cdot 79 \text{ N/mm}^2$$

Evaluate Formula 

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

Formula

$$P_d = \frac{\tau \cdot h_1 \cdot L}{\sin(\theta) \cdot (\sin(\theta) + \cos(\theta))}$$

Example with Units

$$26.871 \text{ kN} = \frac{6.5 \text{ N/mm}^2 \cdot 21.2 \text{ mm} \cdot 195 \text{ mm}}{\sin(45^\circ) \cdot (\sin(45^\circ) + \cos(45^\circ))}$$

Evaluate Formula 

3) Leg of Weld given Allowable Load per mm Length of Transverse Fillet Weld Formula

Formula

$$h_1 = \frac{P_a}{0.8284 \cdot \tau_{\max}}$$

Example with Units

$$21.0563 \text{ mm} = \frac{1378 \text{ N/mm}}{0.8284 \cdot 79 \text{ N/mm}^2}$$

Evaluate Formula 

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

Formula

$$h_1 = 1.21 \cdot \frac{P_a}{\tau_{\max}}$$

Example with Units

$$21.1061 \text{ mm} = 1.21 \cdot \frac{1378 \text{ N/mm}}{79 \text{ N/mm}^2}$$

Evaluate Formula 

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

Formula

$$h_1 = P_d \cdot \sin(\theta) \cdot \frac{\sin(\theta) + \cos(\theta)}{\tau \cdot L}$$

Example with Units

$$21.1992 \text{ mm} = 26.87 \text{ kN} \cdot \sin(45^\circ) \cdot \frac{\sin(45^\circ) + \cos(45^\circ)}{6.5 \text{ N/mm}^2 \cdot 195 \text{ mm}}$$

Evaluate Formula 



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

Formula

$$L = 1.21 \cdot \frac{P}{h_1 \cdot \tau_{\max}}$$

Example with Units

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

Evaluate Formula 

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

Formula

$$L = P_d \cdot \sin(\theta) \cdot \frac{\sin(\theta) + \cos(\theta)}{\tau \cdot h_1}$$

Example with Units

$$194.9927 \text{ mm} = 26.87 \text{ kN} \cdot \sin(45^\circ) \cdot \frac{\sin(45^\circ) + \cos(45^\circ)}{6.5 \text{ N/mm}^2 \cdot 21.2 \text{ mm}}$$

Evaluate Formula 

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

Formula

$$L = \frac{P_t}{0.707 \cdot h_1 \cdot \sigma_t}$$

Example with Units

$$195.7779 \text{ mm} = \frac{165.5 \text{ kN}}{0.707 \cdot 21.2 \text{ mm} \cdot 56.4 \text{ N/mm}^2}$$

Evaluate Formula 

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

Formula

$$\tau_{\max} = \frac{P_a}{0.8284 \cdot h_1}$$

Example with Units

$$78.4645 \text{ N/mm}^2 = \frac{1378 \text{ N/mm}}{0.8284 \cdot 21.2 \text{ mm}}$$

Evaluate Formula 

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

Formula

$$\tau_{\max} = 1.21 \cdot \frac{P}{h_1 \cdot L}$$

Example with Units

$$78.6471 \text{ N/mm}^2 = 1.21 \cdot \frac{268.7 \text{ kN}}{21.2 \text{ mm} \cdot 195 \text{ mm}}$$

Evaluate Formula 

11) Permissible Tensile Strength for Double Transverse Fillet Joint Formula

Formula

$$\sigma_t = \frac{P}{1.414 \cdot L \cdot L}$$

Example with Units

$$4.9975 \text{ N/mm}^2 = \frac{268.7 \text{ kN}}{1.414 \cdot 195 \text{ mm} \cdot 195 \text{ mm}}$$

Evaluate Formula 



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

Formula

$$\tau = P_d \cdot \sin(\theta) \cdot \frac{\sin(\theta) + \cos(\theta)}{h_1 \cdot L}$$

Evaluate Formula 

Example with Units

$$6.4998 \text{ N/mm}^2 = 26.87 \text{ kN} \cdot \sin(45^\circ) \cdot \frac{\sin(45^\circ) + \cos(45^\circ)}{21.2 \text{ mm} \cdot 195 \text{ mm}}$$

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

Formula

$$P_t = \sigma_t \cdot 0.707 \cdot h_1 \cdot L$$

Example with Units

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

Evaluate Formula 

14) Tensile Stress in Transverse Fillet Weld Formula

Formula

$$\sigma_t = \frac{P_t}{0.707 \cdot h_1 \cdot L}$$

Example with Units

$$56.625 \text{ N/mm}^2 = \frac{165.5 \text{ kN}}{0.707 \cdot 21.2 \text{ mm} \cdot 195 \text{ mm}}$$

Evaluate Formula 

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

Formula

$$\sigma_t = \frac{P_t}{0.707 \cdot h_1 \cdot L}$$

Example with Units

$$56.625 \text{ N/mm}^2 = \frac{165.5 \text{ kN}}{0.707 \cdot 21.2 \text{ mm} \cdot 195 \text{ mm}}$$

Evaluate Formula 

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

Formula

$$t = \frac{P_t}{L \cdot \sigma_t}$$

Example with Units

$$15.0482 \text{ mm} = \frac{165.5 \text{ kN}}{195 \text{ mm} \cdot 56.4 \text{ N/mm}^2}$$






Evaluate Formula 



Variables used in list of Transverse Fillet Weld Formulas above

- h_l Leg of Weld (Millimeter)
- L Length of Weld (Millimeter)
- P Load on Weld (Kilonewton)
- P_a Load per Unit Length in Transverse Fillet Weld (Newton per Millimeter)
- P_d Load on Double Transverse Fillet Weld (Kilonewton)
- P_t Load on Transverse Fillet Weld (Kilonewton)
- t Thickness of Transverse Fillet Welded Plate (Millimeter)
- θ Weld Cut Angle (Degree)
- σ_t Tensile Stress in Transverse Fillet Weld (Newton per Square Millimeter)
- τ Shear Stress in Transverse Fillet Weld (Newton per Square Millimeter)
- τ_{\max} Maximum Shear Stress in Transverse Fillet Weld (Newton per Square Millimeter)

Constants, Functions, Measurements used in list of Transverse Fillet Weld Formulas above


- **Functions:** \cos , $\cos(\text{Angle})$
Cosine of an angle is the ratio of the side adjacent to the angle to the hypotenuse of the triangle.
- **Functions:** \sin , $\sin(\text{Angle})$
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 ($^\circ$)
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 



Download other Important Welded Joints PDFs

- [Important Butt Welds Formulas](#) 
- [Important Transverse Fillet Weld Formulas](#) 
- [Important Parallel Fillet Welds Formulas](#) 

Try our Unique Visual Calculators

-  [Winning percentage](#) 
-  [LCM of two numbers](#) 
-  [Mixed fraction](#) 

Please **SHARE** this PDF with someone who needs it!

This PDF can be downloaded in these languages

[English](#) [Spanish](#) [French](#) [German](#) [Russian](#) [Italian](#) [Portuguese](#) [Polish](#) [Dutch](#)

9/18/2024 | 10:05:59 AM UTC

