Important Parallel Fillet Welds Formulas PDF

Formulas
Examples
with Units

List of 15
Important Parallel Fillet Welds Formulas

1) Allowable Load in Parallel Fillet Weld per Unit Length Formula

Evaluate Formula

Formula

$$P_a = 0.707 \cdot \tau \cdot h_l$$

Example with Units

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

2) Force in Parallel Fillet Weld given Shear Stress Formula

Evaluate Formula

Formula

$$P_f = \tau \cdot L \cdot \frac{h_l}{\sin(\theta) + \cos(\theta)}$$

Example with Units

$$111080.8185\,\text{N} = 38\,\text{N/mm}^2 \cdot 195\,\text{mm} \cdot \frac{21.2\,\text{mm}}{\sin(45°) + \cos(45°)}$$

3) Leg of Parallel Fillet Weld given Shear Stress Formula

Evaluate Formula

Formula

$$h_l = \frac{P_f}{\tau \cdot L \cdot \cos\left(\frac{\pi}{4}\right)}$$

Example with Units

$$21.1998\,\text{mm} = \frac{111080\,\text{N}}{38\,\text{N/mm}^2 \cdot 195\,\text{mm} \cdot \cos\left(\frac{3.1416}{4}\right)}$$

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

Evaluate Formula

Formula

$$h_l = P_f \cdot \frac{\sin(\theta) + \cos(\theta)}{L \cdot \tau}$$

Example with Units

$$21.1998\,\text{mm} = 111080\,\text{N} \cdot \frac{\sin(45°) + \cos(45°)}{195\,\text{mm} \cdot 38\,\text{N/mm}^2}$$

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

Evaluate Formula

Formula

$$h_l = \frac{h_t}{\cos\left(\frac{\pi}{4}\right)}$$

Example with Units

$$21.2132\,\text{mm} = \frac{15\,\text{mm}}{\cos\left(\frac{3.1416}{4}\right)}$$

6) Length of Parallel Fillet Weld given Shear Stress Formula

Evaluate Formula

Formula

$$L = \frac{P_f}{\tau \cdot h_l \cdot \cos\left(\frac{\pi}{4}\right)}$$

Example with Units

$$194.9986\,\text{mm} = \frac{111080\,\text{N}}{38\,\text{N/mm}^2 \cdot 21.2\,\text{mm} \cdot \cos\left(\frac{3.1416}{4}\right)}$$

7) Length of Parallel Fillet Weld given Shear Stress and Weld Cut Angle Formula

Evaluate Formula

Formula

$$L = P_f \cdot \frac{\sin(\theta) + \cos(\theta)}{h_l \cdot \tau}$$

Example with Units

$$194.9986\,\text{mm} = 111080\,\text{N} \cdot \frac{\sin(45°) + \cos(45°)}{21.2\,\text{mm} \cdot 38\,\text{N/mm}^2}$$

8) Maximum Shear Stress in Parallel Fillet Weld given Load Formula

Evaluate Formula

Formula

$$\tau = \frac{P_f}{0.707 \cdot L \cdot h_l}$$

Example with Units

$$38.0055\,\text{N/mm}^2 = \frac{111080\,\text{N}}{0.707 \cdot 195\,\text{mm} \cdot 21.2\,\text{mm}}$$

9) Shear Stress in Double Parallel Fillet Weld Formula

Evaluate Formula

Formula

$$\tau = \frac{P_{dp}}{0.707 \cdot L \cdot h_l}$$

Example with Units

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

10) Shear Stress in Parallel Fillet Weld Formula

Evaluate Formula

Formula

$$\tau = \frac{P_f}{0.707 \cdot L \cdot h_l}$$

Example with Units

$$38.0055\,\text{N/mm}^2 = \frac{111080\,\text{N}}{0.707 \cdot 195\,\text{mm} \cdot 21.2\,\text{mm}}$$

11) Shear Stress in Parallel Fillet Weld given Load Formula

Evaluate Formula

Formula

$$\tau = P_f \cdot \frac{\sin(\theta) + \cos(\theta)}{L \cdot h_l}$$

Example with Units

$$37.9997\,\text{N/mm}^2 = 111080\,\text{N} \cdot \frac{\sin(45°) + \cos(45°)}{195\,\text{mm} \cdot 21.2\,\text{mm}}$$

12) Shear Stress Parallel Fillet Weld Formula

Evaluate Formula

Formula

$$\tau = \frac{P_f}{L \cdot h_l \cdot \cos\left(\frac{\pi}{4}\right)}$$

Example with Units

$$37.9997\,\text{N/mm}^2 = \frac{111080\,\text{N}}{195\,\text{mm} \cdot 21.2\,\text{mm} \cdot \cos\left(\frac{3.1416}{4}\right)}$$

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

Evaluate Formula

Formula

$$P_f = \tau \cdot L \cdot h_l \cdot 0.707$$

Example with Units

$$111064.044\,\text{N} = 38\,\text{N/mm}^2 \cdot 195\,\text{mm} \cdot 21.2\,\text{mm} \cdot 0.707$$

14) Throat of Parallel Fillet Weld Formula

Evaluate Formula

Formula

$$h_t = h_l \cdot \cos\left(\frac{\pi}{4}\right)$$

Example with Units

$$14.9907\,\text{mm} = 21.2\,\text{mm} \cdot \cos\left(\frac{3.1416}{4}\right)$$

15) Width of Plane in Double Parallel Fillet Weld Formula

Evaluate Formula

Formula

$$t' = \frac{h_l}{\sin(\theta) + \cos(\theta)}$$

Example with Units

$$14.9907\,\text{mm} = \frac{21.2\,\text{mm}}{\sin(45°) + \cos(45°)}$$

Variables used in list of Parallel Fillet Welds Formulas above

- h_l Leg of Weld *(Millimeter)*
- h_t Throat Thickness of Weld *(Millimeter)*
- **L** Length of Weld *(Millimeter)*
- **L** Length of Weld *(Millimeter)*
- P_a Allowable Load Per Unit Length of Weld *(Newton per Millimeter)*
- P_{dp} Load on Double Parallel Fillet Weld *(Newton)*
- P_f 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 in list of Parallel Fillet Welds Formulas above

- constant(s): **pi**, 3.14159265358979323846264338327950288 *Archimedes' constant*
- Functions: **cos**, cos(Angle) *Cosine of an angle is the ratio of the side adjacent to the angle to the hypotenuse of the triangle.*
- Functions: **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*

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