



calculatoratoz.com



unitsconverters.com

Flanged Coupling Formulas

Calculators!

Examples!

Conversions!

Bookmark calculatoratoz.com, unitsconverters.com

Widest Coverage of Calculators and Growing - **30,000+ Calculators!**
Calculate With a Different Unit for Each Variable - **In built Unit Conversion!**
Widest Collection of Measurements and Units - **250+ Measurements!**

Feel free to SHARE this document with your friends!

[Please leave your feedback here...](#)



List of 16 Flanged Coupling Formulas

Flanged Coupling

1) Diameter of bolt given maximum load that can be resisted by one bolt

$$\text{fx } d_{\text{bolt}} = \sqrt{\frac{4 \cdot W}{\pi \cdot f_s}}$$

Open Calculator 

$$\text{ex } 18.09432\text{mm} = \sqrt{\frac{4 \cdot 3.6\text{kN}}{\pi \cdot 14\text{N}/\text{mm}^2}}$$

2) Diameter of bolt given torque resisted by n bolts

$$\text{fx } d_{\text{bolt}} = \sqrt{\frac{8 \cdot T_{\text{bolt}}}{f_s \cdot \pi \cdot n \cdot d_{\text{pitch}}}}$$

Open Calculator 

$$\text{ex } 18.0827\text{mm} = \sqrt{\frac{8 \cdot 49\text{N}^*\text{m}}{14\text{N}/\text{mm}^2 \cdot \pi \cdot 1.001 \cdot 27.23\text{mm}}}$$



3) Diameter of bolt given torque resisted by one bolt

[Open Calculator !\[\]\(4729e517bc6a7cd81c8025b9646574fb_img.jpg\)](#)

$$\text{fx } d_{\text{bolt}} = \sqrt{\frac{8 \cdot T_{\text{bolt}}}{f_s \cdot \pi \cdot d_{\text{pitch}}}}$$

$$\text{ex } 18.09174\text{mm} = \sqrt{\frac{8 \cdot 49\text{N}\cdot\text{m}}{14\text{N}/\text{mm}^2 \cdot \pi \cdot 27.23\text{mm}}}$$

4) Diameter of bolt pitch circle given torque resisted by n bolts

[Open Calculator !\[\]\(e474458956c9a37fbf9586ddb60a7fa1_img.jpg\)](#)

$$\text{fx } d_{\text{pitch}} = \frac{8 \cdot T_{\text{bolt}}}{f_s \cdot \pi \cdot (d_{\text{bolt}}^2) \cdot n}$$

$$\text{ex } 27.20802\text{mm} = \frac{8 \cdot 49\text{N}\cdot\text{m}}{14\text{N}/\text{mm}^2 \cdot \pi \cdot ((18.09\text{mm})^2) \cdot 1.001}$$

5) Diameter of bolt pitch circle given torque resisted by one bolt

[Open Calculator !\[\]\(4fe57c3593bf1b21d272ae7ac8dfaf77_img.jpg\)](#)

$$\text{fx } d_{\text{pitch}} = \frac{8 \cdot T_{\text{bolt}}}{f_s \cdot \pi \cdot (d_{\text{bolt}}^2)}$$

$$\text{ex } 27.23523\text{mm} = \frac{8 \cdot 49\text{N}\cdot\text{m}}{14\text{N}/\text{mm}^2 \cdot \pi \cdot ((18.09\text{mm})^2)}$$




6) Diameter of shaft given torque transmitted by shaft 

$$\text{fx } d_s = \left(\frac{16 \cdot T_{\text{shaft}}}{\pi \cdot \tau} \right)^{\frac{1}{3}}$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)

$$\text{ex } 50.30796\text{mm} = \left(\frac{16 \cdot 50\text{N}\cdot\text{m}}{\pi \cdot 2\text{MPa}} \right)^{\frac{1}{3}}$$

7) Maximum amount of load that can be resisted by one bolt 

$$\text{fx } W = \frac{f_s \cdot \pi \cdot d_{\text{bolt}}^2}{4}$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)

$$\text{ex } 3.598281\text{kN} = \frac{14\text{N}/\text{mm}^2 \cdot \pi \cdot (18.09\text{mm})^2}{4}$$

8) Number of bolts given torque resisted by n bolts 

$$\text{fx } n = \frac{8 \cdot T_{\text{bolt}}}{f_s \cdot \pi \cdot (d_{\text{bolt}}^2) \cdot d_{\text{pitch}}}$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7_img.jpg\)](#)

$$\text{ex } 1.000192 = \frac{8 \cdot 49\text{N}\cdot\text{m}}{14\text{N}/\text{mm}^2 \cdot \pi \cdot ((18.09\text{mm})^2) \cdot 27.23\text{mm}}$$



9) Shear stress in bolt given torque resisted by n bolts

$$f_s = \frac{8 \cdot T_{\text{bolt}}}{n \cdot \pi \cdot (d_{\text{bolt}}^2) \cdot d_{\text{pitch}}}$$

[Open Calculator !\[\]\(e2376d476d06eb31946dc01a69a4403a_img.jpg\)](#)

$$\text{ex } 13.9887\text{N/mm}^2 = \frac{8 \cdot 49\text{N}\cdot\text{m}}{1.001 \cdot \pi \cdot ((18.09\text{mm})^2) \cdot 27.23\text{mm}}$$

10) Shear stress in bolt given torque resisted by one bolt

$$f_s = \frac{8 \cdot T_{\text{bolt}}}{\pi \cdot (d_{\text{bolt}}^2) \cdot d_{\text{pitch}}}$$

[Open Calculator !\[\]\(0b5e7e25e8775f7e7e80906ada4f0021_img.jpg\)](#)

$$\text{ex } 14.00269\text{N/mm}^2 = \frac{8 \cdot 49\text{N}\cdot\text{m}}{\pi \cdot ((18.09\text{mm})^2) \cdot 27.23\text{mm}}$$

11) Shear Stress in Bolt using Maximum Load that can be Resisted by One Bolt

$$f_s = \frac{4 \cdot W}{\pi \cdot (d_{\text{bolt}}^2)}$$

[Open Calculator !\[\]\(bd3b31712ad9bab5a241210fa6925cdd_img.jpg\)](#)

$$\text{ex } 14.00669\text{N/mm}^2 = \frac{4 \cdot 3.6\text{kN}}{\pi \cdot ((18.09\text{mm})^2)}$$



12) Shear stress in shaft given torque transmitted by shaft

$$fx \quad \tau = \frac{16 \cdot T_{\text{shaft}}}{\pi \cdot (d_s^3)}$$

[Open Calculator !\[\]\(d3fb9f94af8b26d1c844efa9a98805b0_img.jpg\)](#)

$$ex \quad 2.00095MPa = \frac{16 \cdot 50N \cdot m}{\pi \cdot ((50.3mm)^3)}$$

13) Torque resisted by one bolt given shear stress in bolt

$$fx \quad T_{\text{bolt}} = \frac{f_s \cdot \pi \cdot (d_{\text{bolt}}^2) \cdot d_{\text{pitch}}}{8}$$

[Open Calculator !\[\]\(e1d6102fe77919492c04879c8450f1f5_img.jpg\)](#)

$$ex \quad 48.99059N \cdot m = \frac{14N/mm^2 \cdot \pi \cdot ((18.09mm)^2) \cdot 27.23mm}{8}$$


14) Torque Resisted by One Bolt using Load Resisted by One Bolt

$$fx \quad T_{\text{bolt}} = W \cdot \frac{d_{\text{pitch}}}{2}$$

[Open Calculator !\[\]\(ab4e2b3fc7e7887b7a72f548aa6f5e60_img.jpg\)](#)

$$ex \quad 49.014N \cdot m = 3.6kN \cdot \frac{27.23mm}{2}$$




15) Torque transmitted by shaft 

$$\text{fx } T_{\text{shaft}} = \frac{\pi \cdot \tau \cdot d_s^3}{16}$$

[Open Calculator !\[\]\(9dfdaff1d86ba3c1f8353b4d1b61b8c5_img.jpg\)](#)

$$\text{ex } 49.97627\text{N}\cdot\text{m} = \frac{\pi \cdot 2\text{MPa} \cdot (50.3\text{mm})^3}{16}$$

16) Total torque resisted by n number of bolts 

$$\text{fx } T_{\text{bolt}} = \frac{n \cdot f_s \cdot \pi \cdot (d_{\text{bolt}}^2) \cdot d_{\text{pitch}}}{8}$$

[Open Calculator !\[\]\(2b376d1a92330ab09dad2665d2f89bf5_img.jpg\)](#)

$$\text{ex } 49.03958\text{N}\cdot\text{m} = \frac{1.001 \cdot 14\text{N}/\text{mm}^2 \cdot \pi \cdot ((18.09\text{mm})^2) \cdot 27.23\text{mm}}{8}$$








Variables Used

- d_{bolt} Diameter of Bolt (Millimeter)
- d_{pitch} Diameter of Bolt Pitch Circle (Millimeter)
- d_s Diameter of Shaft (Millimeter)
- f_s Shear Stress in Bolt (Newton per Square Millimeter)
- n Number of Bolts
- T_{bolt} Torque Resisted by Bolt (Newton Meter)
- T_{shaft} Torque Transmitted by Shaft (Newton Meter)
- W Load Resisted by One Bolt (Kilonewton)
- τ Shear Stress in Shaft (Megapascal)



Constants, Functions, Measurements used

- **Constant:** **pi**, 3.14159265358979323846264338327950288
Archimedes' constant
- **Function:** **sqrt**, sqrt(Number)
A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- **Measurement:** **Length** in Millimeter (mm)
Length Unit Conversion 
- **Measurement:** **Pressure** in Newton per Square Millimeter (N/mm²)
Pressure Unit Conversion 
- **Measurement:** **Force** in Kilonewton (kN)
Force Unit Conversion 
- **Measurement:** **Torque** in Newton Meter (N*m)
Torque Unit Conversion 
- **Measurement:** **Stress** in Megapascal (MPa)
Stress Unit Conversion 



Check other formula lists

- [Deviation of Shear Stress produced in a Circular Shaft subjected to Torsion Formulas](#) 
- [Expression for Strain Energy stored in a Body Due to Torsion Formulas](#) 
- [Expression for Torque in terms of Polar Moment of Inertia Formulas](#) 
- [Flanged Coupling Formulas](#) 
- [Polar Modulus Formulas](#) 
- [Torque Transmitted by a Hollow Circular Shaft Formulas](#) 

Feel free to SHARE this document with your friends!

PDF Available in

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

11/8/2024 | 8:19:03 AM UTC

[Please leave your feedback here...](#)

