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

Open Calculator

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

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

2) Diameter of bolt given torque resisted by n bolts

Open Calculator

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

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

3) Diameter of bolt given torque resisted by one bolt

Open Calculator

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

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

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

Open Calculator

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

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

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

Open Calculator

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

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

6) Diameter of shaft given torque transmitted by shaft

Open Calculator

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

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

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

Open Calculator

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

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

8) Number of bolts given torque resisted by n bolts

Open Calculator

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

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

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

Open Calculator

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

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

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

Open Calculator

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

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

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

Open Calculator

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

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

12) Shear stress in shaft given torque transmitted by shaft

Open Calculator

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

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

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

Open Calculator

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

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

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

Open Calculator

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

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

15) Torque transmitted by shaft

Open Calculator

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

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

16) Total torque resisted by n number of bolts

Open Calculator

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

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

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...*