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Elastic Packing Formulas

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List of 9 Elastic Packing Formulas

Elastic Packing

1) Diameter of Bolt given Frictional Force exerted by Soft packing on Reciprocating rod

$$fx \quad d = \frac{F_{\text{friction}}}{.005 \cdot p}$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b_img.jpg\)](#)

$$ex \quad 13.86792\text{mm} = \frac{294\text{N}}{.005 \cdot 4.24\text{MPa}}$$

2) Fluid pressure by soft packing exerted by frictional force on reciprocating rod

$$fx \quad p = \frac{F_{\text{friction}}}{.005 \cdot d}$$

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d_img.jpg\)](#)

$$ex \quad 4.2\text{MPa} = \frac{294\text{N}}{.005 \cdot 14\text{mm}}$$

3) Fluid Pressure given Friction Resistance

$$fx \quad p = \frac{F_{\text{friction}} - F_0}{\mu \cdot A}$$

[Open Calculator !\[\]\(f60b7a900783ac3fd531bfd9c111be6d_img.jpg\)](#)

$$ex \quad 4.20202\text{MPa} = \frac{294\text{N} - 190\text{N}}{0.3 \cdot 82.5\text{mm}^2}$$



4) Fluid Pressure given Torsional Resistance

$$fx \quad p = \frac{M_t \cdot 2}{.005 \cdot (d)^2}$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235_img.jpg\)](#)

$$ex \quad 4.204082MPa = \frac{2.06N \cdot 2}{.005 \cdot (14mm)^2}$$

5) Friction resistance

$$fx \quad F_{friction} = F_0 + (\mu \cdot A \cdot p)$$

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0_img.jpg\)](#)

$$ex \quad 294.94N = 190N + (0.3 \cdot 82.5mm^2 \cdot 4.24MPa)$$

6) Frictional force exerted by soft packing on reciprocating rod

$$fx \quad F_{friction} = .005 \cdot p \cdot d$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f_img.jpg\)](#)

$$ex \quad 296.8N = .005 \cdot 4.24MPa \cdot 14mm$$


7) Seal resistance

$$fx \quad F_0 = F_{friction} - (\mu \cdot A \cdot p)$$

[Open Calculator !\[\]\(b64b40baaee5acddc1eab8538ba84754_img.jpg\)](#)

$$ex \quad 189.06N = 294N - (0.3 \cdot 82.5mm^2 \cdot 4.24MPa)$$




8) Torsional Resistance given Fluid Pressure 

$$\text{fx } M_t = \frac{.005 \cdot (d)^2 \cdot p}{2}$$

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

$$\text{ex } 2.0776\text{N} = \frac{.005 \cdot (14\text{mm})^2 \cdot 4.24\text{MPa}}{2}$$

9) Torsional resistance in rotary motion friction 

$$\text{fx } M_t = \frac{F_{\text{friction}} \cdot d}{2}$$

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

$$\text{ex } 2.058\text{N} = \frac{294\text{N} \cdot 14\text{mm}}{2}$$







Variables Used

- **A** Area of seal contacting sliding member (*Square Millimeter*)
- **d** Diameter of elastic packing bolt (*Millimeter*)
- **F₀** Seal Resistance (*Newton*)
- **F_{friction}** Friction Force in elastic packing (*Newton*)
- **M_t** Torsional Resistance in Elastic Packing (*Newton*)
- **p** Fluid Pressure in elastic packing (*Megapascal*)
- **μ** Coefficient of Friction in elastic packing




Constants, Functions, Measurements used

- **Measurement: Length** in Millimeter (mm)
Length Unit Conversion 
- **Measurement: Area** in Square Millimeter (mm²)
Area Unit Conversion 
- **Measurement: Pressure** in Megapascal (MPa)
Pressure Unit Conversion 
- **Measurement: Force** in Newton (N)
Force Unit Conversion 



Check other formula lists

- [Bolt Loads in Gasket Joints Formulas](#) 
- [Elastic Packing Formulas](#) 
- [V Ring Packing Formulas](#) 

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