



# Hydrostatic Step Bearing with Pad Formulas

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Examples!

Conversions!

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### List of 10 Hydrostatic Step Bearing with Pad Formulas

### Hydrostatic Step Bearing with Pad 🕑

1) Dimension b of Slot given Flow of Lubricant

fx 
$$b = l \cdot 12 \cdot \mu_l \cdot rac{Q_{slot}}{\left(h^3
ight) \cdot \Delta P}$$

ex  $46.58824 \text{mm} = 48 \text{mm} \cdot 12 \cdot 220 \text{cP} \cdot \frac{15 \text{mm}^3/\text{s}}{((0.02 \text{mm})^3) \cdot 5.1 \text{MPa}}$ 

2) Dimension X in Terms of Total Projected Area of Bearing Pad 🕑

$$fx = \frac{A_p}{Y}$$

$$ex 32.14286mm = \frac{450mm^2}{14mm}$$

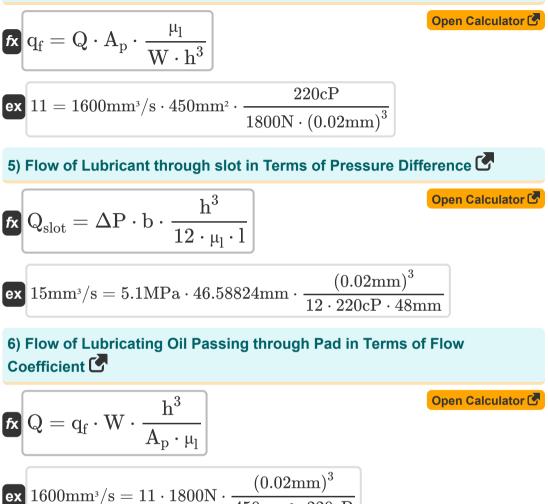
$$3) Dimension X in Terms of Total Projected Area of Bearing Pad$$

fx 
$$Y = \frac{A_p}{X}$$
  
ex  $14.0625mm = \frac{450mm^2}{32mm}$ 



Open Calculator

4) Flow Coefficient in Terms of Flow of Lubricant through Pad



$$1600 \mathrm{mm^3/s} = 11 \cdot 1800 \mathrm{N} \cdot rac{(0.02 \mathrm{mm})^3}{450 \mathrm{mm^2} \cdot 220 \mathrm{cP}}$$



### 7) Length of Slot in Direction of Flow in Terms of Flow of Lubricant



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## Variables Used

- af Load Coefficient for Bearing
- Ap Total Projected Area of Bearing Pad (Square Millimeter)
- **b** Breadth of Slot for Oil Flow (Millimeter)
- h Oil Film thickness (Millimeter)
- I Length of Slot in Direction of Flow (Millimeter)
- **p**<sub>r</sub> Pressure of Lubricating Oil (Megapascal)
- **Q** Flow of Lubricant (Cubic Millimeter per Second)
- **q**<sub>f</sub> Flow Coefficient
- **Q**slot Flow of Lubricant from Slot (Cubic Millimeter per Second)
- W Load Acting on Sliding Bearing (Newton)
- X Dimension X of Bearing Pad (Millimeter)
- Y Dimension Y of Bearing Pad (Millimeter)
- ΔP Pressure Difference between Slot Sides (Megapascal)
- **µ** Dynamic Viscosity of Lubricant (Centipoise)



### **Constants, Functions, Measurements used**

- Measurement: Length in Millimeter (mm) Length Unit Conversion
- Measurement: Area in Square Millimeter (mm<sup>2</sup>) Area Unit Conversion
- Measurement: Pressure in Megapascal (MPa)
   Pressure Unit Conversion
- Measurement: Force in Newton (N) Force Unit Conversion
- Measurement: Volumetric Flow Rate in Cubic Millimeter per Second (mm<sup>3</sup>/s)
   Volumetric Flow Rate Unit Conversion C
- Measurement: Dynamic Viscosity in Centipoise (cP)
   Dynamic Viscosity Unit Conversion



# Check other formula lists Film Thickness Formulas Hydrostatic Step Bearing with Pad Formulas

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