

[Home](#) > A flat foot step bearing 225 mm in diameter supports a load of 7500 N. If the co-efficient of friction is 0.09 and the shaft rotates at 600 rpm, calculate the power lost in friction.

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Question:

A flat foot step bearing 225 mm in diameter supports a load of 7500 N. If the co-efficient of friction is 0.09 and the shaft rotates at 600 rpm, calculate the power lost in friction.

Answer:

Problem on Foot step bearing $D = 225 \text{ mm} = 0.225 \text{ m}$ $W = 7500 \text{ N}$ $\mu = 0.09$ $N = 600 \text{ rpm}$ $\omega = 2 \pi N / 60 = 62.83 \text{ rad/sec}$ Uniform pressure condition Frictional torque $T = \frac{2}{3} \mu W R = 50.625 \text{ Nm}$ Power lost in friction $= T \times \omega = 50.625 \times 62.83 = 3180.8 \text{ W}$ -----
Ans Uniform wear condition Frictional torque $T = \frac{1}{2} \mu W R = 37.98 \text{ Nm}$ Power lost in friction $= T \times \omega = 37.98 \times 62.83 = 2385.57 \text{ W}$ ----- Ans
