

Given: Radial load = 300 lb
Shaft diameter = 1.5 inch
Shaft speed = 625 rpm
 $L/D \approx 1-1.5$.

Find: Plane surface bearing made from either bronze or a polymer material.

Solution: Choose an $L/D = 1.25$.

$$\Rightarrow L = 1.25(1.5 \text{ inch}) = 1.875$$

$$A_p = \text{Projected Area} = (1.25 \text{ in})(1.875 \text{ in}) = 2.34 \text{ in}^2$$

$$P = F/A_p = 300 \text{ lb} / 2.34 \text{ in}^2 = 128 \text{ psi}$$

$$V = (1.5 \text{ in} / 2) \left(\frac{\text{ft}}{12 \text{ in}} \right) (625 \text{ rev} / \text{min}) \left(\frac{2\pi \text{ rad}}{\text{rev}} \right) \\ = 245 \text{ ft} / \text{min}$$

$$\Rightarrow PV = (128 \text{ psi})(245 \text{ ft} / \text{min}) = 31,360 \text{ psi} \cdot \text{ft} / \text{min}$$

From the IGUS polymer bearing data on the next sheet, the only material that will meet this PV requirement is T500 ($PV_{\text{all}} = 37,700$).

The last sheet shows the IGUS Part No.

TSI-2426-24 has the following dimensions.

$$\text{I.D.} = 1.5 \text{ in.}$$

$$\text{O.D.} = 1.6562 \text{ in.}$$

$$\text{Length} = 1.5 \text{ in.}$$

This bearing will have a $PV = 26,133 \text{ psi} \cdot \text{ft}/\text{min}$
which is less than the $PV_{\text{all}} = 37,700 \text{ psi} \cdot \text{ft}/\text{min}$.

⇒ Bearing meets design requirements.

A bronze bearing typically has a $PV_{\text{all}} \approx 5000$.

A bronze bearing will not meet the design requirements.

Innovation with Polymers

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Specs for all iglide® bearings

iglide Line	Description	Ideal for	Load psi	PV	Friction	Temp. Continuous	Temp. Short Term	Color
<u>M250</u>	cost effective, interchange with bronze bearings	low to medium loads	2,610	3,400	.1 - .30	-40°F to +176°F	338°F	charcoal glossy
<u>J</u>	low wear, low friction material	stainless, aluminum shafting	5,075	9,700	.08 - .18	-40°F to +194°F	248°F	yellow
<u>G300</u>	medium grade, all-round bearing	general bearing applications	11,600	12,000	.08 - .15	-40°F to +266°F	428°F	dark gray
<u>L280</u>	low wear, low friction	stainless, aluminum shafting	8,700	6,600	.08 - .23	-40°F to +194°F	356°F	yellow
<u>Q</u>	high load material	pivot points	14,500	16,000	.05 - .15	-40°F to +275°F	311°F	glossy black
<u>T500</u>	high load, high temperature, chemical resistant material	very demanding applications and demanding environments	21,750	37,700	.09 - .27	-149°F to +482°F	600°F	black
<u>H370</u>	high performance for wet environments	underwater applications	10,875	21,000	.07 - .17	-40°F to +392°F	464°F	gray
<u>Clip</u>	for sheetmetal housings	light-duty applications	2,610	9,800	.18 - .30	-40°F to +176°F	338°F	charcoal glossy
<u>A200</u>	FDA approved	direct food contact	2,610	2,900	.10 - .40	-40°F to +146°F	338°F	white



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ID OD Length

TSI-1618-08	1	1 1/8	1/2	1.0041	1.0007	1.1255	1.1247	.9991	.9979	DXF
TSI-1618-12	1	1 1/8	3/4	1.0041	1.0007	1.1255	1.1247	.9991	.9979	DXF
TSI-1618-16	1	1 1/8	1	1.0041	1.0007	1.1255	1.1247	.9991	.9979	DXF
TSI-1618-24	1	1 1/8	1 1/2	1.0041	1.0007	1.1255	1.1247	.9991	.9979	DXF
TSI-1820-12	1 1/8	1 9/32	3/4	1.1288	1.1254	1.2818	1.2808	1.1238	1.1226	DXF
TSI-2022-20	1 1/4	1.4062	1 1/4	1.2548	1.2508	1.4068	1.4058	1.2488	1.2472	DXF
TSI-2426-12	1 1/2	1.6562	3/4	1.5048	1.5008	1.6568	1.6558	1.4988	1.4972	DXF
TSI-2426-16	1 1/2	1.6562	1	1.5048	1.5008	1.6568	1.6558	1.4988	1.4972	DXF
→ TSI-2426-24	1 1/2	1.6562	1 1/2	1.5048	1.5008	1.6568	1.6558	1.4988	1.4972	DXF
TSI-2629-20	1 5/8	1.7812	1 1/4	1.6297	1.6258	1.7818	1.7808	1.6238	1.6222	DXF
TSI-2831-16	1 3/4	1.9375	1	1.7547	1.7507	1.9381	1.9371	1.7487	1.7471	DXF
TSI-3235-24	2	2 3/16	1 1/2	2.0057	2.0011	2.1883	2.1871	1.9981	1.9969	DXF
TSI-3235-32	2	2 3/16	2	2.0057	2.0011	2.1883	2.1871	1.9981	1.9969	DXF
TSI-3639-32	2 1/4	2 7/16	2	2.2577	2.2531	2.4377	2.4365	2.2507	2.2489	DXF
TSM-0608-13	6	8	13.8	6.058	6.010	8.015	8.000	6.000	5.970	DXF
TSM-2023-20	20	23	20	20.104	20.020	23.021	23.000	20.000	19.948	DXF

Material Specs

Design Guide

Application Examples

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