SLIDING BEARINGS DIVISION
HYDRAULIC, ENERGY AND METAL INDUSTRY

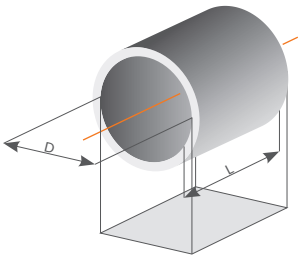
SIMPLIFIED SIZING
RADIAL SLIDING BEARINGS

Bearing sizing is carried out so that the specific pressure does not exceed the applicable load value (see tables B1 and B2) depending on the type of bearing and the conditions of use.

$$p = \frac{F}{D \times L \times Fc} \leq Pam$$

Given:
p = Pressure on the bearing (N/mm^2)
F = Applied load (N)
D = Internal diameter of the bearing (mm)
L = Lenght of the bearing (mm)
Fc = Correction factor of the bearing size (tables A1 and A2)
Pam = Admissible pressure according to the conditions of use (see maximum recommended value in Tables B1 and B2)

For a simplified calculation we consider the projection between the internal diameter and the length of the bearing so to find the contact area where pressure will be exerted. Obviously this type of calculation is very simplified, in fact you will have to correct the result of this area with a correction factor that varies according to the bearing diameter (table A1 for the PMT coating and table A2 for the TX and TF coating)



PMT

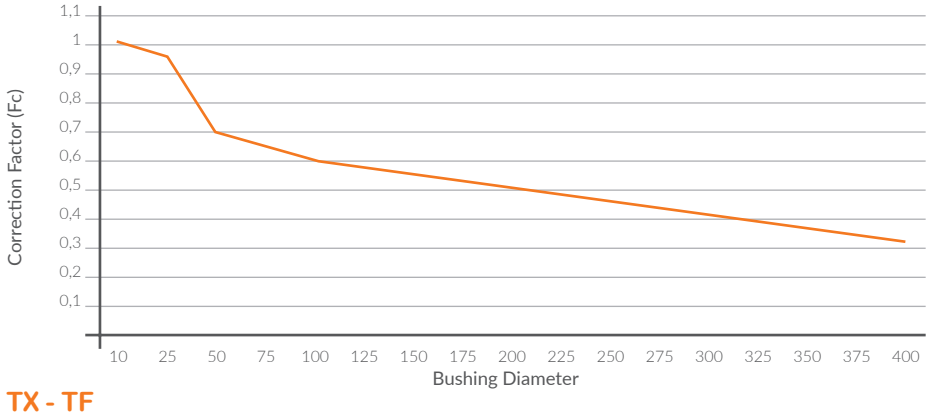


Table A1: PMT coated self-lubricating bushing correction factor. The contact surface decreases proportionally as the diameter increases

TX - TF

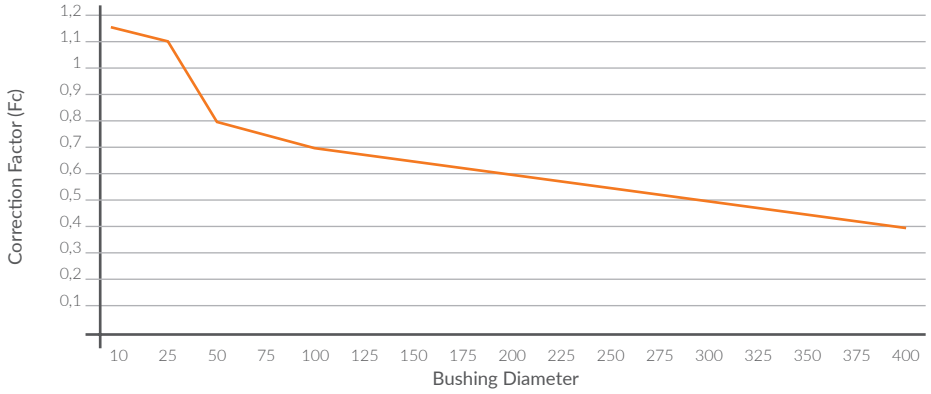


Table A2: TX and TF coated self-lubricating bushing correction factor. The contact surface decreases proportionally as the diameter increases

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Admissible pressure - TF - TX

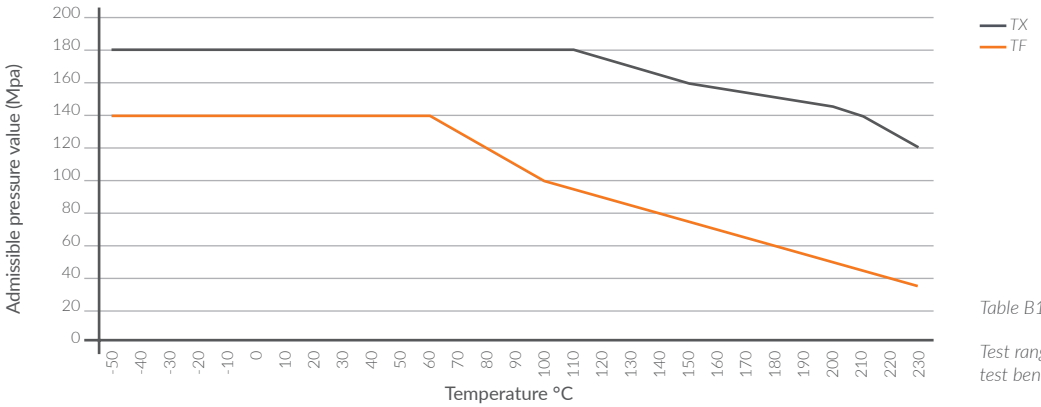

Table B1: Admissible pressure TX e TF

Test range performed with the Slib Italy test bench.

Admissible pressure - PMT

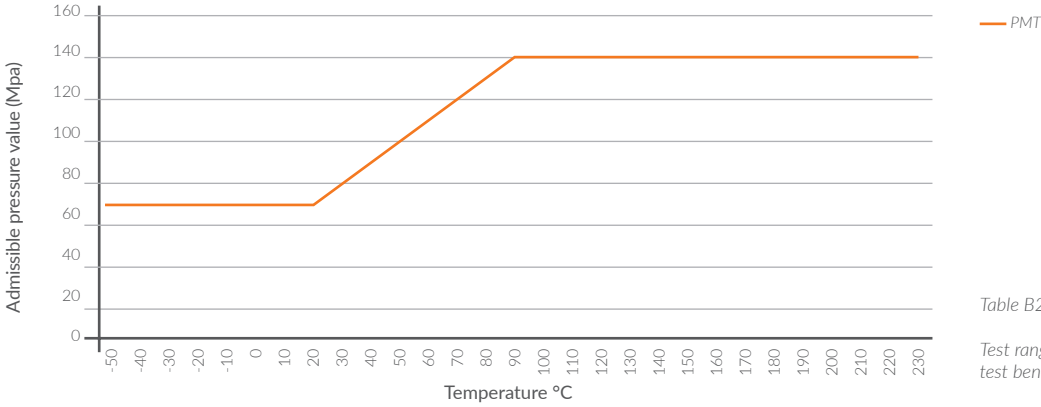

Table B2: Admissible pressure PMT

Test range performed with the Slib Italy test bench.

Calculation example:
Bearing sizing by knowing the diameter of the spindle and the force applied
Diameter of the spindle: 80 mm
Total applied force: 360.000 N (application with n°1 bearing)
Operating temperature: 150 ° C
Material used: TX

From the tables I will obrain:
Pam= See table B1= 160 Mpa
Correction factor (Fc)= See table A2= 0.7
With this I can get the length of the bearing:

$$L = \frac{F}{D \times Pam \times Fc} = \frac{360000}{80 \times 160 \times 0.7} = 40.17 \text{ mm}$$

For further technical information, contact our offices

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