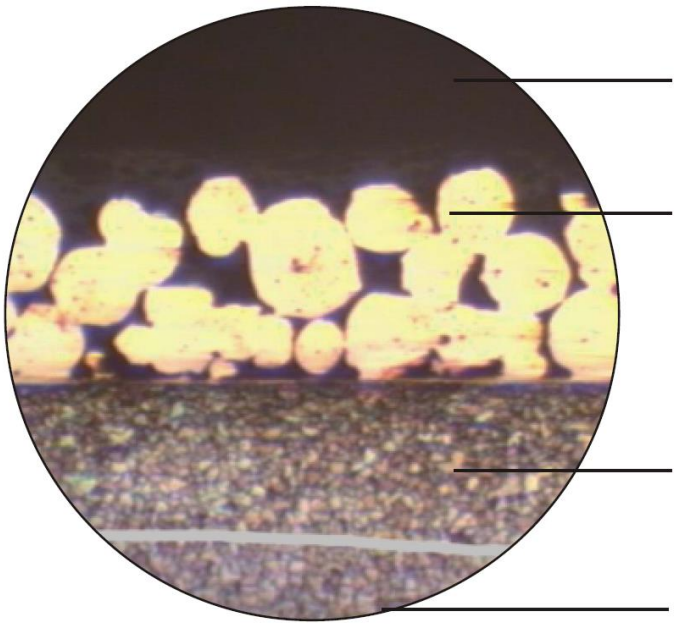
Dry Plain Bearing Technical Information

STRUCTURE

PFB and J450 triple layer composite material consists of 3 bonded layers : a steel backing strip, a sintered porous spherical bronze particles inter layer, and impregnated and overlaid with a polymer material. The surface polymer layer being calendered into the pore of bronze is a PTFE and Fiber, the overlaid layer thickness is about 0.01~0.03mm.



1 · PTEF with Fiber 0.01 ~ 0.03mm.

2 · Porous bronze 0.20 ~ 0.35mm.

3 · PFB steel backing 0.7 ~ 2.2mm.
J450 steel backing 1.7 ~ 3.2mm.

4 · Tin/Copper electro-plating 0.002mm.

Fig.1

Fig.2 Oilles Bushes, Washers and Flanged Bushes of PFB and J450

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APPLICATION CHARACTERISTICS

1 · Oilless or only a trace of oil is needed, may be used where no oil can be applied or oil is difficult to be applied.
2 · Low friction, low wear and long life.
3 · Load may be spread on a wider area owing to its elasto-plastic property.
4 · Low and similar static and dynamic friction with elimination of stick-slip and thus ensure the accuracy of machine motion under very low sliding speed.
5 · May be used at wide temperature range between -195℃ ~ +280℃.
6 · Good running in property, without the need of scrapping before installation.
7 · Low vibration, low noice and low air pollution.
8 · Forming a transfer film of PTFE and Fiber, which can protect the mating metal surface.
9 · Lower hardness of the mating surface is required, decreasing the difficulty of manufacture.
10 · Compact and light.
11 · Absorbs no oil and water, low heat expansion, high heat conductivity, and so shows high stability of dimension.
12 · Many be electro-plated by various metals, can resist most industrial liquids and gasses.
13 · Better dust and dirt tolerance.

FRICTION

PFB and J450 bears very low friction coef., it varies from 0.03 to 0.20. The higher the load, and the lower the speed, the lower the friction coef. will be, as shown in fig. 3. When there be a trace of oil, the coef. of friction of SF-1 may be lower than 0.05, even under low load and high speed.

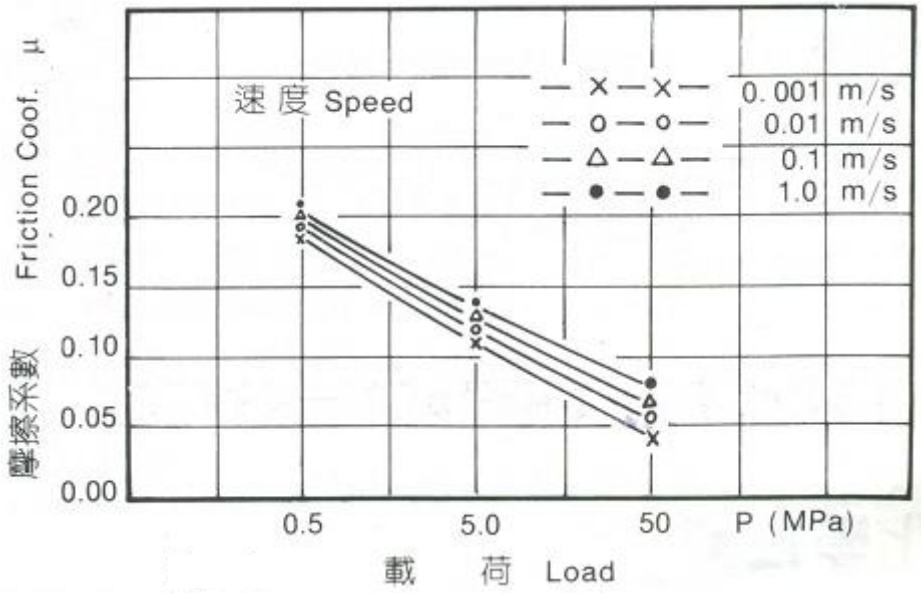

Fig.3

Dry Plain Bearing Technical Information

PHISICAL

Load limit	250N/mm^2
Upper limit of temp	+280℃
Lower limit of temp	-195℃
Linear expansion	3.0×10^{-5}/℃
Thermal conductivity	40w/MK
Friction coefficient	0.03 ~ 0.20
Anti-radiation	10^6 rads

WEAR

PFB and J450 bearing is usually easy to run in. The initial wear is about 0.01 ~ 0.02mm while a part of the surface PTFE is transfered to the mating surface, forming a half transparent film, which behaves as solid lubricant and protacts the mating surface. The surface roughness usually must be lower than Rz 2um. until about 80% of the bronge will be exposed, then the life of the bush is about to an end. The typical wear curve is shown in fig.4.

CHEMICAL

The surface layer of PFB and J450 can resist most of the chemicals. The exposed steel backing and end face of the element may be tin flashed for protection in mildly corrosive surroundings. I fexposed tocorrosive liquid, further protection should be provided by electro plating with lead, nickel, cadmiun or chromium.

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LOAD LIMIT

The load limit of PFB and J450 may attain 140 MPa under steady load. (see fig4). If longer life is desired, decrease of specific load is necessary, under dynamic or fluctuating load, the load limit is not higher than 56MPa.

If F be the total load, d1 be the inside diameter and b the width of the bearing, than the load equals to :

$$P=\frac{F}{d1\times b}$$

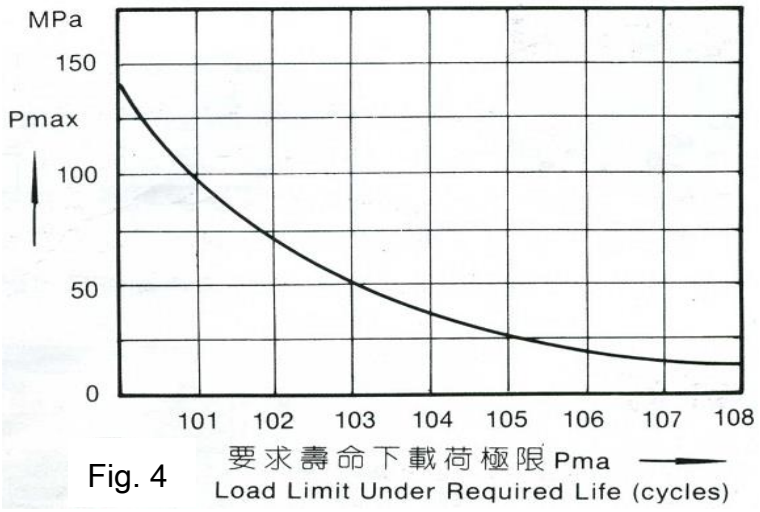

Fig. 4

PV LIMIT

The product of specific load P and the sliding velocify V is usually called the PV value of the bearing. It is an important factor for selection of bearing material. Simultaneously. PV value is an important factor for predicting of the longer the bush life is required. The lower the PV limit may be. As shown on fig.5.

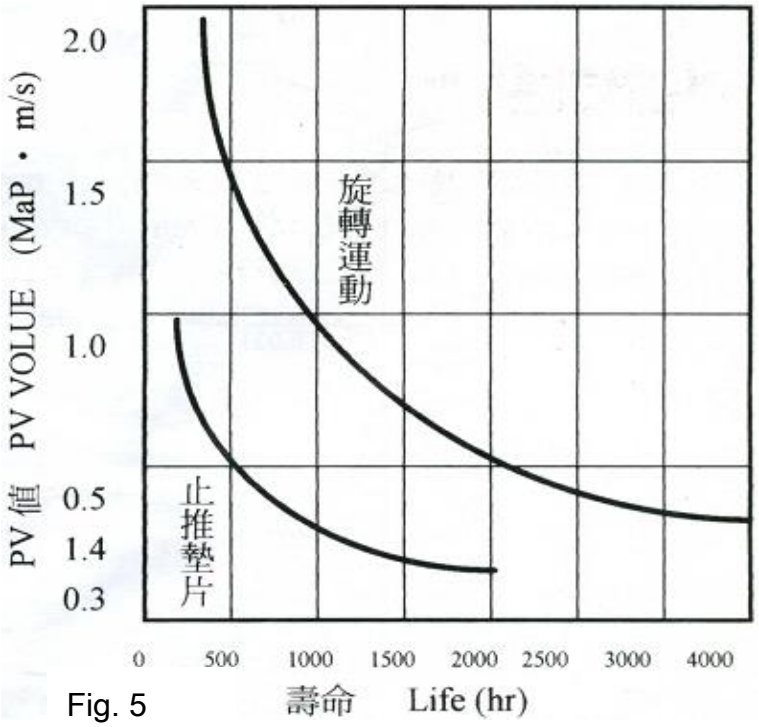

Fig. 5