Technical report

Sintered bearing Porite HSP

Porite HSP was developed to be a “sintered bearing for high-speed application”.

[Purpose of development]

The pores of a sintered bearing have the advantage of supplying the impregnated oil to the bearing surface but at the same time have the disadvantage of weakening the oil film formed by the wedge effect.

As the operating speed of the bearing increases, the temperature of the impregnated oil increases reducing the strength of the oil film. Moreover, due to an increase in the oil film pressure, the amount of oil flowing out of the pores increases resulting in a loss of oil which is a severe operating condition for the sintered bearing.

Porite HSP powder is manufactured by a special process and by using a special sintering process minute pore size can be achieved resulting in an increased strength of the oil film by controlling the escape of the impregnated oil which makes it ideal for high speed applications.

[Characteristics]

1. A low coefficient of friction is possible due to a high strength of the oil film.
2. It is possible to control the temperature rise during operation by using an optimized viscosity lubricant.
3. It is possible to control the oil leak due to a high capillary strength resulting from the fine pores.
4. Since the sliding surface is covered by copper alloy, this has superior ageing and corrosion resistance properties compared to usual Fe-Cu bearings.
5. Higher wear resistance compared to bronze bearings due to the presence of Fe phase below the copper alloy on the surface.
6. Corresponds to ELV and RoHS.

[Applications]

Used for high speed applications (shaver, drier, juicer, mixer, vibration motor, etc.)

[Chemical composition and Physical characteristics]

Chemical composition (weight%)

Fe	Cu	Sn	C	Others
Bal	50~65	2~7	1Max	1Max

Physical characteristics

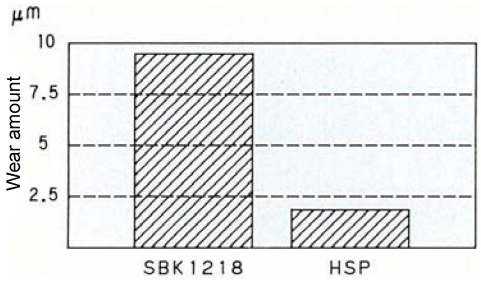
Density	: 6.0~6.8	[×10^3kg/cm^3]
Porosity	: 18 Min	[Vol%]
Radial strength	: 150 Min	[Kgf/mm^2]
PV value	: 2.0	[MPa・m/s]

[Bearing properties]

1. Wear resistance property

Condition

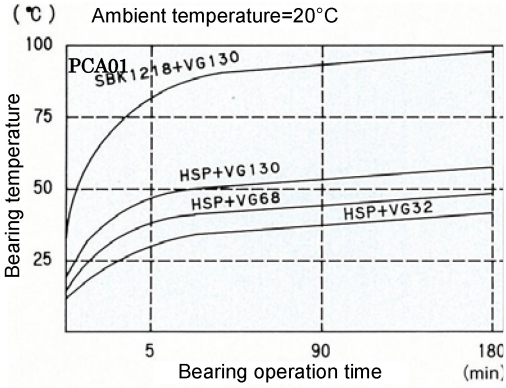
Imp. oil : FBK turbine #32
Shaft : S45C 0.8S ϕ8mm
Rot. Speed : 3000rpm
PV value : 0.4→0.8→1.7→3.3 (Stepped)MPa·m/s



2. Bearing temperature property

Condition

Bearing : ϕ8mm×L10mm
Imp. Oil : VG32, VG68, VG130
Shaft : S45C 0.8S ϕ8mm
Rot. Speed : 15000rpm
Amb. Temp : Room Temp. (20°C)



Bearing temperature during high-speed operation

[Lubricating oil]

The impregnating oil may change depending on the various operating conditions, please discuss with technical department personnel.

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