VOSS LOW-FRICTION SLIDE BEARINGS

Voss slide bearings utilize the extremely low friction characteristics and long service life of face to face PTFE bearing surfaces permanently bonded to steel. This construction assures efficient structural adjustment to stresses caused by changes in temperature, varying load pressure, and vibration.

Coefficient of friction tests were conducted on two sets of specimens; 6x6x 3/32 in. thick, unfilled PTFE and 6x6x 3/32 in. thick filled PTFE bonded to 5x6x 1/8 in. thick steel plates. Tests on unfilled PTFE were conducted at uniform compressive stresses of 500 and 1000 psi. The tests on filled PTFE were conducted at uniform compressive stresses of 500, 1000, and 2000 psi. The results of these tests are shown in figure A3 (on page 22).

As shown in the data, unfilled PTFE sliding against unfilled PTFE has frictional values ranging from 0.04 at 500 psi to 0.034 at 1000 psi.

At compressive loads beyond 1000 psi, the unfilled teflon will deform in a manner which restricts movement. This effect is called *plowing* and occurs when the teflon plate starts to embed itself into the larger unfilled PTFE plate as shown in Fig. 33. This condition limits the free movement of the PTFE surfaces. It is due to this plowing effect that unfilled PTFE slide bearings are limited to 1000 psi.

For design stresses that exceed 1000 psi, glass filled PTFE is recommended. Glass filled PTFE sliding against glass filled PTFE is the most popular type of slide bearing due to its ability to withstand allowable compressive stresses to 2000 psi. Glass filled PTFE sliding surfaces have frictional values ranging from 0.10 at 500 psi. to 0.06 at a 2000 psi compressive stress. Filled PTFE also has the added advantage of better wear resistance and reduced cold flow because of the glass fiber reinforcement. Filled material is also more economical since smaller sizes can be used to handle the same loads as unfilled PTFE.

When designing slide bearings with filled PTFE, it is recommended that the stress for the smaller element not exceed 2000 psi. To maintain low friction the minimum stress should be greater than 75 psi. The upper element should be larger than the lower element to accommodate expansion due to thermal movements and to protect the lower element from dust and dirt which could collect and become embedded in the PTFE surface.

Slide bearings with steel backings are not designed to compensate for rotation in any application. If rotation is a factor in the design, the bearing assembly should then utilize a substrate material like SORBTEX or FIBERLAST. (See SORBTEX pages 5 thru 14, FIBERLAST pages 15 thru 19) Chloroprene or natural rubber is not recommended as a substrate material because of its lower shear modulus. In slide bearing applications where Chloroprene has been used, shear movements well in excess of the 50 percent shear strain allowed by AASHTO have resulted in failure of the Chloroprene.

Bearing height must also be considered when designing slide bearing assemblies. The standard steel backing plate thickness is usually 1/8 in. However, thicker plates can be specified to achieve the required design height. While carbon steel is the most common type of backing material, stainless steel can be specified for applications where corrosion must be controlled.

SLIDE BEARING TYPE	STEEL THICKNESS	STEEL TYPE	PTFE THICKNESS
VSB 10	10 gage	Carbon or Stainless Steel	3/32" Other thicknesses available. Please consult factory.
VSB 25	0.250		
VSB 37	0.375		
VSB 50	0.500		
VSB 75	0.750		
VSB 100	1.00		

Specifications for 25% Glass Filled PTFE

PTFE Properties	Test Method	
Hardness Shore D	ASTM D 2240	65
Tensile Strength	ASTM D 638	2500 psi
Elongation at Break	ASTM D 638	200%
Deformation Under Load	ASTM D 621	4.9% at 1200 psi
Specific Gravity	ASTM D 792	2.22

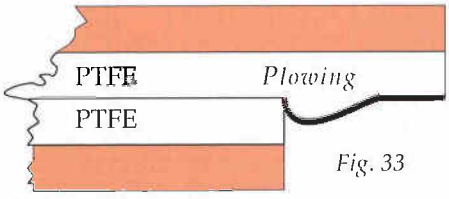

Fig. 33

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