



Hybrid Ceramic Bearings

Williams uses the finest hybrid ceramic bearings.

Specifications:

- Bearing is ABEC 3.
- Si_3N_4 ball is Grade 5. (Grease working temperature is from +177 degree C to -40 degree C.)

Hybrid ball bearings with steel rings and ceramic balls have become indispensable for many advanced applications. Among the ceramic material, silicon nitride (Si_3N_4) is excellent for use in precision ball bearings.

The advantages include:

Temperature Range

Standard bearings reduce their hardness and fatigue lives when they are continuously used in high operating temperatures. Silicon nitride (Si_3N_4) is suitable to be used in high temperature environments without loss of its hardness and life endurance. With its rings made of special steel for high temperatures, hybrid bearings with ceramic balls are successfully used in the field of high temperatures.

Density

The specific gravity of ceramic material is one-half that of bearing steel. For this reason, use of ceramic balls with smaller ball diameter greatly reduces the influence of centrifugal force (ball sliding and spinning caused by gyratory moment).

Thermal Expansion

The thermal expansion of silicon nitride (Si_3N_4) is one fourth that of bearing steel. For this reason, use of ceramic reduces the influence of dimensional change due to different operating temperatures. It is suitable for silicon nitride to be used in a wide range of temperature operations.

Hardness, Young's Modulus, Poisson Ratio

The Young's modulus of ceramic material is approximately 1.5 times that of bearing steel. The rigidity of these ball bearings is, therefore, greatly increased.

Hybrid ceramic bearing precautions:

- Hybrid ceramic bearings can be damaged by high impact loads. Therefore, hybrid ceramic bearings perform best when limited to road use.
- Extra care should be taken to reduce the risk of dirt and debris contaminating the bearings. Do not pressure wash your Williams hubs.