

# Ceramic bearings

Common bearing steel AISI52100 (GCr15), stainless steel AISI440 (9Cr18), silicon nitride (Si<sub>3</sub>N<sub>4</sub>) and zirconia (ZrO<sub>2</sub>) bearing performance comparison of four kinds of bearing materials, ceramic bearings as an important mechanical basic parts, due to its metal bearing Incomparable superior performance, high temperature resistance, super strength, etc. take the lead in the new materials world. In the past decade or more, it has been increasingly used in various fields of national economy and people's livelihood.

First, since ceramics are hardly corroded, ceramic rolling bearings are suitable for operation under harsh conditions filled with corrosive media.

Second, since ceramic rolling balls have a lower density than steel and a much lighter weight, the eccentricity of the outer ring during rotation can be reduced by 40%, and the service life is greatly extended.

Third, ceramics are less affected by thermal expansion and contraction than steel, and therefore allow bearings to operate in environments where the temperature difference changes drastically when the bearing clearance is constant.

Fourth, because the elastic modulus of ceramics is higher than that of steel, it is not easy to deform when subjected to stress, which helps to increase the working speed and achieve high accuracy.

Application area editing

Medical equipment, cryogenic engineering, optical instruments, high-speed machine tools, high-speed motors, printing machinery, food processing machinery.

In the fields of aerospace, navigation, nuclear industry, petroleum, chemical industry, textile industry, machinery, metallurgy, electric power, food, locomotives, subways, high-speed machine tools and scientific research and defense military technology, high temperature, high speed, cryogenic, flammable, Explosive, strong corrosion, vacuum, electrical insulation, non-magnetic, dry friction and other special working conditions, the indispensable replacement of ceramic bearings is gradually understood by people.

With the continuous advancement of processing technology and the ever-increasing level of technology, the cost of ceramic bearings has been declining. It has only been applied in small, high-precision and high-tech areas in the past, and has been gradually extended to various industrial sectors of the national economy. Also gradually approaching practicality, to the extent acceptable to users, the wave of large-scale application of ceramic bearings has emerged!