

Bearings / Galas / Rodamientos / ????????? / Lager / ?o?yska

Bearings are an important component of contemporary machinery and equipment. Its main function is to support the mechanical rotating body, reduce the friction coefficient during its movement, and guarantee its rotation accuracy.

The early form of linear motion bearings was to place a row of wood rods under a row of jaws. Modern linear motion bearings use the same principle of operation, except that balls are sometimes used instead of rollers. The simplest rotary bearing is the sleeve bearing, which is just a bushing sandwiched between the wheel and the axle. This design was subsequently replaced by rolling bearings, which replaced the original bushing with many cylindrical rollers, each rolling like a single wheel.

An example of an early ball bearing was found on an ancient Roman vessel built in Naples, Italy, built in 40 BC: a wooden ball bearing was used to support the rotating tabletop. It is said that Leonardo Da Vinci described a type of ball bearing about 1500 years ago. Among the various immature factors of ball bearings, there is a very important point that collisions between balls will occur, causing additional friction. However, this can be prevented by placing the ball in a small cage. In the 17th century, Galileo made the earliest description of the "caged ball" ball bearings. At the end of the seventeenth century, C. Vallo of the United Kingdom designed and manufactured ball bearings and installed them on the postal trains, and P. Worth of the United Kingdom obtained patents on ball bearings. The earliest commercially available rolling bearings with cages were invented by the watchmaker John Harrison in 1760 for the production of the H3 timepiece. At the end of the eighteenth century, Germany's H.R. Hertz published a paper on ball bearing contact stress. Based on the achievements of Hertz, Germany's R. Streibeck and Sweden's A. Pamgren and others conducted extensive tests and contributed to the development of the design theory and fatigue life calculation of rolling bearings. Subsequently, Russia's N.P. Petrov applied Newton's law of viscosity to calculate bearing friction. The first patent on ball channels was obtained by Carmarthen's Philip Vaughan in 1794.

In 1883, Friedrich Fisher proposed the use of suitable production machines to grind steel balls of the same size and roundness, laying the foundation for the bearing industry. O. Reynolds of the United Kingdom conducted a mathematical analysis of Thor's findings and derived the Reynolds equation, which laid the foundation for the hydrodynamic lubrication theory.