



**THE HISTORY
— OF —
BALL BEARINGS**

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It would be difficult to imagine the modern industrial age without bearings. Every kind of machine that deals with motion makes use of bearings to smoothen its path and reduce friction. Such an important piece of technology did not fall into the laps of engineers when they started creating metal machines, but has a long and storied history of use that stretches all the way back to the stone age.

WOODEN BEARINGS

Even before the creation of the wheel at the very beginning of human civilization, the concept of bearings had already taken shape. At that time, people realized that placing rolling logs beneath heavy objects made it easier to drag them across a surface.

The evidence of such a mechanism is evident through cave drawings, and at a later time, through Egyptian pyramid drawings, which show wooden rollers being used to move heavy stones during construction. Various liquids were also used to provide lubrication to the bearings and make their motion smoother. Different materials were experimented upon to create better bearings, from bronze to zinc, although they were found to be inadequate in providing support to the heavy-duty automated machinery that was to come later.



THE INDUSTRIAL AGE

With the rise of improved metal forming processes at the start of the industrial age, it was determined that bearings made of steel were far better at their job than wooden or bronze bearings. Philip Vaughan received a patent for a ball bearing in 1794, and his design became the basic blueprint for the creation of the modern ball bearing. A dramatic reduction in friction led to far more efficient machines, which was responsible for machines being manufactured in far greater numbers, leading to the creation of factories.

Bearings were also put to use in smaller devices such as watches, where sapphire bearings allowed for more precise timekeeping. Water mills also made use of increasingly sophisticated bearings to make the process of drawing water less difficult.



PRESENT DAY

In 1869, Jules Suriray received a patent for a radial ball bearing to be fitted into metal bicycles. The success of the improved design led to the creation of several new types of metal ball bearings, all with different designs that were specially created for a particular machine.

It was Sven Winqvist who came up with a self-aligning design for ball bearings that set a new standard in terms of design. A quick succession of innovations within the field emerged, from the wire race bearing to the vee groove bearing.

During the 20th century, improvements in bearings went hand-in-hand with the great advances in the automotive, machine tool and military industries. The choice of rolling elements expanded from balls to rollers, tapered rollers and spherical rollers. Bearings could support greater forces and combined (axial and radial) loads.

Metallurgical processes improved as humanity's understanding of chemistry increased, leading to harder, more wear-resistant materials. Improved lubricants made it possible for bearings to operate at higher speeds and temperatures. New and improved bearings are today put to use in a variety of machines, big and small, from dental drills to the Mars Rover spaceship.

Bearings have had a long and complex history, from the first primitive wooden bearing to the modern class of self-lubricating bearings. With continued development in material science and lubricant technology, and steady improvements in manufacturing, the future promises bearings of a more sophisticated design than ever before.

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