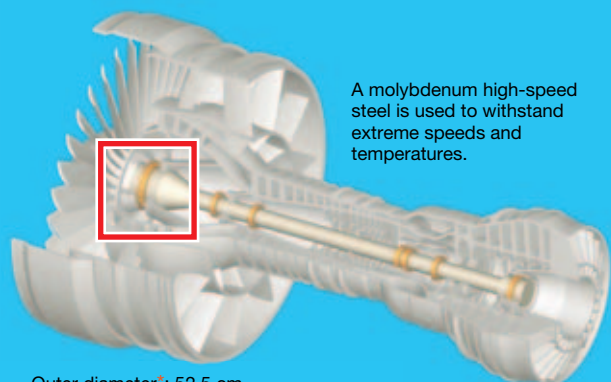


1 With a lineup of bearings from small to extra-large, NTN bearings contribute to society

Our bearings range in size from several millimeters to five meters (and larger), and are used in a wide variety of industrial machinery.

Medium, large, and extra-large bearings are used all around the world in jet engines, rocket engines, CT scanners for hospitals, wind power generators, railroads, Ferris wheels and etc.



A molybdenum high-speed steel is used to withstand extreme speeds and temperatures.

Outer diameter*: 52.5 cm



Jet engine bearings

We have been given the "Certified Supplier" designation by General Electric, the world's largest aircraft engine manufacturer, indicating GE's confidence in NTN.

* Outer diameter: the diameter of the outside of the bearing

Jet engine bearings that support safe air travel Rocket bearings that help achieve extreme rotational speeds

NTN produces and supplies bearings that support the high-speed rotation of shafts inside jet engines.

Bearings for jet engines need to be durable to operate under extreme conditions — temperatures of approximately 200°C and speeds of approximately 10,000 rpm. The material we chose for this application is molybdenum high-speed steel, which maintains its hardness and its dimensions at high temperatures and withstands the friction and centrifugal forces that occur at high speeds. In the event that the lubricant supply to the bearing stops during flight, the bearing is designed to rotate for a set period of time without seizing — an example of how we work to ensure quality when it affects safety.

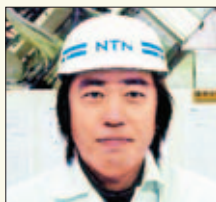
NTN supplies high-performance, high-quality bearings for jet engines in Japan and around the world including General Electric (GE). To help ensure safe air travel, we work with our group company S.N.R. Roulements, which has a great deal of experience with aerospace bearings in Europe.

Our company's products have actually left this planet and gone into the vastness of outer space. For example, the turbo-pumps in the engine of the domestically-produced H-2A rocket contained our bearings and a large number of our products can be found in "Kibo," the international space station's Japanese Experiment Module.

Enabling precision medical examinations and supporting health with our low-vibration bearings for CT scanners

CT scanners (computed tomography scanners) are indispensable tools for diagnosing disease. Demand for CT scanners continues to grow as the populations of developed countries age and the economies of the BRIC countries grow. Our large bearings are used in the gantry of CT scanners — the rotating X-ray device and frame that are rotated around the patient to take images.

In recent years, the inner bore size of the gantry has been increasing to accommodate people with larger body frames, while at the same time, there has been a demand for lighter and more compact devices to make them easier to transport and install. When the scanner



Working to further improve our quality through daily improvement

Tsutomu Sato

Assistant Manager, Manufacturing Section-2
Extra-large Bearings Plant, Kuwana Works

Kuwana Works' Extra-large Bearings Plant 2 started production in February 2007 to expand production of bearings for industrial machinery. In this facility, cutting-edge equipment is used to produce bearings primarily for wind power generators, CT scanners, mining and construction machinery.

All of us at Manufacturing Section-2 work hard to achieve further improvements in quality, and we focus on our "5S-3TEI" activities every day (see. p. 10). The average age here is 32, which makes us a pretty young workforce, but we will continue to think of creative solutions for daily improvement.



Outer diameter: 120 cm

Low-vibration bearings for CT scanners

Using a dynamic damper that eliminates external vibrations, we simultaneously achieved the contradictory objectives of a larger design that is also lighter and more compact.

turns on a lighter, more compact frame, however, the frame tends to vibrate, preventing the accuracy that is so vital to the examination.

This is why our engineers developed **a low-vibration bearing for CT scanners** with a dynamic damper that controls vibration.

The dynamic damper actively eliminates external vibrations and achieves the seemingly contradictory objectives of a larger design that is at the same time lighter and more compact. Our company continues to work to develop bearings that help people maintain their health around the world.

Wind power generator bearings meet a variety of needs including longer life, higher output, and larger sizes

We develop and manufacture bearings used in wind power generators, including the main shaft that support the wind power generator blades, the gear box that transmit the rotational motion of the blades to the generator, the drive unit that changes the direction of the nacelle (the part that contains the gear box and generator) according to the direction of the wind, and the generator itself.

Wind power generation farm are often constructed in isolated areas, and the generator itself is high above the ground. Thus, they are difficult to do maintenance and the primary parts of the generators need to be reliable over a long period of time. Recently, wind power generators have been increasing in size with the objective of improving generating efficiency, and there is a growing need for extra-large bearings that can withstand larger loads. It is for these reasons that we are increasing our lineup of **bearings for wind power generators** starting with our "spherical roller bearings," which are able to meet the need for longer life, higher output, and larger size.

Wind power is a clean form of energy without CO₂ emissions. Because further demand is expected around the world, we started production of these bearings in February 2007 at Kuwana Works' Extra-large Bearings Plant 2 and in October 2008 at Kuwana Works'



Outer diameter: 158 cm

Wind power generator bearings

We are increasing our lineup of bearings for wind power generators with longer life, higher output, and larger sizes starting with our "spherical roller bearings"



Railroad bearings

We are working to develop products with high reliability and a lower environmental impact.

Outer diameter: 22 cm

Extra-large Bearings Plant 3. We are also increasing our capacity for producing the bearings for 2.4MW wind power generators, which are the largest class of generators in Japan. Further, in April 2008, we established NTN Houdatsu Shimizu Corporation in Ishikawa Prefecture to manufacture extra-large bearings. This facility is expected to start operations in October 2009.

Railroad bearings that contribute to safety, durability, and a lower environmental impact

In recent years, there has been an increased focus on railroad as a high-volume mode of transportation with low energy consumption. Demand for **railroad bearings** is growing rapidly in China, where the railway network is rapidly growing because of economic development, as well as in Europe, where there is a high level of environmental awareness and a demand for even faster railroad transport because of the expansion of the European Union.

The bearings used in railroads are subjected to stringent controls because they directly affect passenger safety, so we continue to develop products that maintain a high degree of reliability while achieving a lower environmental impact.

Our company's bearings are known for their durability and safety. They have garnered a great deal of trust and are used not just in Japan but in China, North America, and Europe. We will continue to support this low-impact form of high-volume transportation with our bearings.

NTN bearings at the amusement park: Bearings for Ferris wheels

Our extra-large spherical roller bearings are used for the rotating shaft in Ferris wheels. Each bearing supports a massive wheel, gondolas, and passengers, which together weigh approximately 500 tons.

Safety is the greatest priority in Ferris wheels, which carry large numbers of people to great heights. We design these bearings to withstand heavy loads. We carefully consider the materials we use and carry out meticulous quality control in manufacturing them.

These efforts have been recognized and our extra-large bearings are used in Ferris wheels in Japan.



Outer diameter: 115 cm