

# Making the World Run Smoothly

NTN's bearings are found in everything from space rockets to artificial hearts. As the company marks its first century in business, it is establishing new growth drivers for its next 100 years.

People are living longer all the time. For businesses, though, it's the opposite story. From 50 years in the 1920s, the average lifespan of S&P 500 companies has plunged to just 15 today. So it's all the more special for a company to reach the 100-year milestone as Osaka-based bearing manufacturer NTN Corporation will do in 2018.

The secret to NTN's longevity? Products that are as ubiquitous as they are indispensable. "Bearings play an essential role in industrialised society," explains NTN president Hiroshi Ohkubo "They reduce friction, improve energy efficiency and make things work smoothly." Consisting of just four components, bearings are superficially simple; precision, however, is crucial for optimum performance.

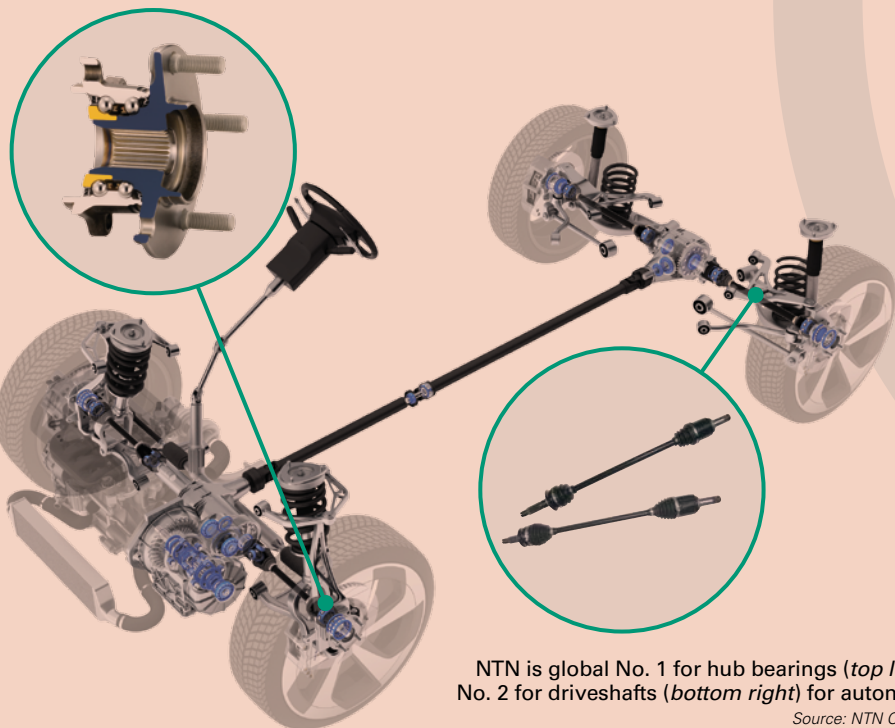
NTN's bearings have been proving their worth in the toughest environments for decades. When the first Japanese-made plane flew from Tokyo to London in 1937, its engines contained NTN bearings. The same is true of the first bullet train in 1964. NTN is now the sole Japanese manufacturer certified to supply bearings to the world's big four jet-engine makers. It also provides the bearings for the Japan Aerospace Exploration Agency's launch vehicles and asteroid explorers.

## Gasoline cars and EVs

NTN actually generates the bulk of its business in more down-to-earth settings. Seventy percent of the firm's \$6.1 billion (¥683.3 billion) revenues come from the automobile business, with just two products—hub bearings and driveshafts—accounting for 80% of sales to the sector. In hub bearings (which enable the wheels to rotate), NTN is the overwhelming global market leader; in driveshafts (which transmit torque to the wheels) it is global No. 2. Its customers include all the global carmakers.

Despite this dominance, NTN is not resting on its laurels. "We've been making bearings for 100 years, and driveshafts for 50. Will these products alone sustain us for another century?" asks Ohkubo, rhetorically. "No, we need to move into new fields." That's the thinking that inspired him to launch NTN 100—his plan to transform the company for the next 100 years—two years ago.

NTN's core automobile business stands first in line for a makeover. With governments everywhere announcing bans on diesel and gasoline vehicles, the switch to electric vehicles (EVs) is gathering momentum. With EVs having fewer moving parts than traditional gasoline vehicles, is NTN's core business under threat? Hardly. The hub bearings and driveshafts where NTN is world leader (and which it is already supplying to the top EV brands) are essential components for EVs. In addition, NTN is treating electrification as an opportunity to develop new parts such as



NTN is global No. 1 for hub bearings (top left) and No. 2 for driveshafts (bottom right) for automobiles. Source: NTN Corporation



Hiroshi Ohkubo President, NTN Corporation

“Bearings play an essential role in industrialised society. They reduce friction, improve energy efficiency and make things work smoothly.”

electromechanical brakes or in-wheel motors, drive motors that sit within the tyre hub.

"These new parts will compensate even if there is any overall market shrinkage caused by the spread of EVs," says Ohkubo bullishly. "Besides, regardless of type, the absolute number of vehicles is predicted to rise. NTN comes off a winner either way."

## Four areas of sustainable growth

But EVs represent just one of four new growth areas that NTN 100 is targeting, the others being renewable energy, robotics, and services and solutions. In the energy

field, NTN already produces 2.5-meter-wide bearings for the main shafts of wind turbines, both on- and offshore; now it is developing innovative complete products such as micro-hydro turbines (to generate electricity in off-the-grid places) and hybrid street lights (powered by solar and wind).

If the changeover to clean energy is one trend of our time, automation is surely another. Here, NTN has adapted its driveshaft know-how to create "high-speed parallel link mechanisms." These enable robot arms to manipulate objects with the agility of the human wrist. The result? Complex, multi-angle processes like welding and final product inspection can be successfully automated.

Infrastructure monitoring and maintenance is also increasingly being taken out of human hands. As part of its push into the solutions business, NTN has created a condition monitoring system for bearings in wind turbines. The system is currently monitoring 70 wind turbines around Japan, collecting and analysing sound and vibration data and extending turbine lifecycles via predictive maintenance.

In conjunction with Osaka University, NTN has started research into using AI to

predict the lifespan of bearings based on their state of damage and deterioration. "Collaborating with academia is another key to growth," Ohkubo notes.

## Driving up profits

In parallel with this push into new areas, NTN is also aiming to boost the margins of its existing businesses. Rethinking tried-and-trusted manufacturing processes is one way to increase profitability. "The way we make driveshafts hasn't changed much since the 1960s," says Ohkubo. "We're working on automating more processes and developing standardised parts which are put together in different combinations to meet different OEMs' needs. Production is increasingly modular and, as we make both parts, we, uniquely, can offer driveshafts and hub bearings as a single module."

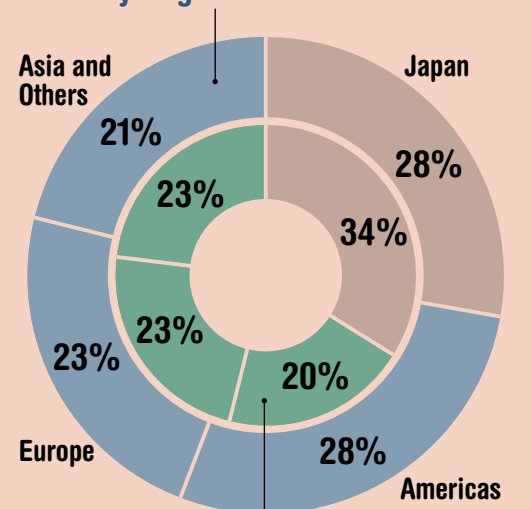
When it comes to profitability, NTN's aftermarket segment is already a standout: accounting for 15% of sales, it generates a hefty 40% of profits. NTN is building brand loyalty among end-users by conducting workshops every year on bearing maintenance and repair via its fleet of service cars, and responding to rising demand with an expanded line-up and shorter delivery times.

## Building a global culture

NTN opened its first overseas factory in the 1960s. The company is now thoroughly global with 72% of sales, 66% of employees and 50% of its manufacturing outside Japan. With such geographical spread, fostering a coherent culture can be a challenge. To ensure that everyone around the world shares the same core values, Ohkubo is promoting NTN's philosophy of "contributing to society through new technologies and new products" and linking it to concrete actions that accord

GLOBAL SALES: ¥683.3 billion

## Sales by Region



## Employees by Region

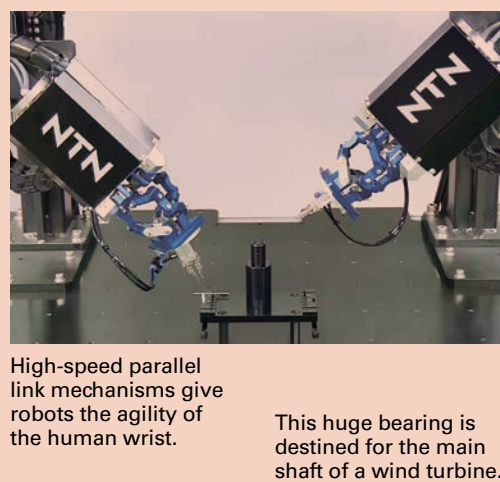
GLOBAL EMPLOYEES: 24,665 people

Fiscal year ended March 31, 2017

with recognised frameworks like the UN sustainable development goals (SDGs) and ESG (environment, social and governance) that have global resonance.

At the practical level, Ohkubo is focused on making sure that all NTN's technical staff around the world share the famous Japanese obsession with quality. Annual Japan-based events like a Global Quality Circle Convention and Technical Skills Competition—not to mention lengthy courses for trainers from abroad—guarantee a consistently high level of skill and knowledge throughout the global network.

"With NTN 100, we're aiming not for change, but for a complete transformation," Ohkubo sums up. "We're using our strong cash flow and balance sheet to invest in promising new growth areas. By recombining all our technologies in interesting ways, we can keep growing for the next 100 years."

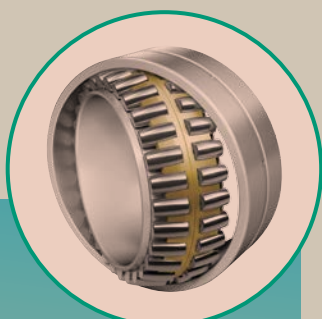


High-speed parallel link mechanisms give robots the agility of the human wrist.

This huge bearing is destined for the main shaft of a wind turbine.

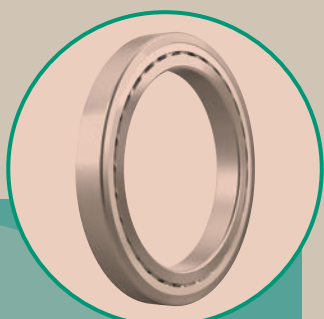
## Bearings that perform in the toughest environments

Pinwheel blades  
100 m in diameter



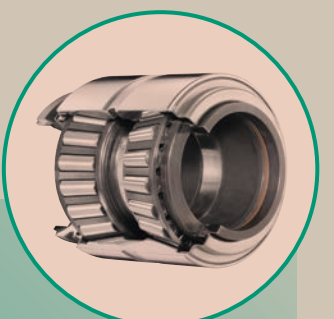
NTN's giant bearings help large-scale wind turbines revolve more smoothly and efficiently.

High precision at  
200°C



NTN's bearings are certified by all the big four jet engine manufacturers.

Operational safety at  
300 km/h



NTN's bearings are used in the high-speed trains of 10 countries including France's TGV and Japan's bullet train.