



Brand of NTN corporation

Make the world
a better road
to drive

PRESS KIT

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EDITORIAL



NTN Group was shaken by the pandemic, of course, and by its direct impact on the automotive sector. Nevertheless, it drew strength from its wide range of activities – industrial, aeronautics and aftermarket – which enabled us to stay on course till recovering a measure of stability during the fiscal year that ended in March 2022.

NTN Group thus continues to pursue its strategy of innovation in mobility markets such as bicycles and electric and self-driving vehicles, and has aligned itself with sustainable development policies, exercising particular care in the selection of materials. NTN has focused on the aftermarket as its core strategy, which features ambitious projects, notably in line with the electrification transition and new forms of mobility that will give rise to new product ranges and services. To support decarbonisation, for example, we are working to develop a line of products based on the circular economy.

To extend the reach of the Group, teams are also working to develop new regional markets, all the while remaining true to the fundamentals of the business, and supply chain concerns notwithstanding. The availability and quality of our products remains our priority, to satisfy our customer base of distributors and repair professionals. To that end, we can rely on our many factories the world over, and especially in Europe.



Christophe IDELON

Vice President Automotive Aftermarket NTN Europe

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Development prospects

Transition to a mobility market.

Well-known and highly respected player in the world of cars and trucks, NTN puts mobility at the heart of everything it does. To adapt to this changing market, the manufacturer is redefining the stakes that drive its activity and establishing itself in new sectors such as the motorcycle and bicycle segments.

Indeed, NTN's range already includes 445 motorcycle bearing references covering more than 3500 models and will continue to evolve with new references associated with our OE market expansion.

In parallel, the manufacturer is committed to innovative projects in the ecosystem of bicycles and e-bikes. With its yearlong experience, NTN effectively plays a key role here by providing mechanical and mechatronic solutions for steering bearings, wheel hubs, bottom bracket bearings, and many torque sensor and electric motor bearing projects. Besides collaborating with prominent partners who continue to put their trust in NTN, the Group is also working with new players, as in the context of the e-bike project led by H3 Bike.



Prototype H3bike - ©H3Bike

Circular economy.

A product's carbon footprint is becoming an increasingly determinant factor today. That's why NTN made this variable a strategic priority and one of the mainstays of its CSR policy. Like the other Business Units, Aftermarket accepts its share of responsibility in this challenge by initiating new projects slated for completion as early as 2023.

A re-manufactured range of CV joints

Relying on its technical expertise as an OE manufacturer and its Aftermarket know-how, first NTN is organising

the launch of a line of re-manufactured CV joints. As an Original Equipment Manufacturer, this is an important challenge for NTN, which will apply all its production experience and aftermarket competence to launch a range of high-quality re-manufactured products on the market. It also goes without saying that NTN will set up the necessary logistics loops to recover the used parts. In parallel, fundamental studies are conducted on the raw materials used to produce the Group's products. The aim here is to provide parts made of materials that have been recycled or are much easier to recycle.

An ability to innovate in OE.

Eco-friendly suspension strut bearing

The environmental impact of a product is a key criterion today. NTN, which aims to offer the most responsible solutions possible, developed an innovative, eco-friendly suspension strut bearing. This innovative strut bearing combines a cover made of recycled polyamide and an aluminum support. Using less virgin raw material and providing greater strength and reduced mass, this durable bearing makes it possible to reduce CO₂ emissions:

- by up to 4.8 kg over the course of the life cycle of a vehicle, and
- by up to 3.6 kg during the production and end of life phases, in response to the new European environmental standards.

The carefully selected polyamide guarantees excellent technical performance with good stability approximating that of virgin raw material. As for the aluminum support, it addresses the cost objectives along with all functional requirements of the applications (notably for electric vehicles, which are heavier than the corresponding IC engine-powered vehicles and require a stronger bearing). This new design also features several enhancements:

- Tougher and more rigid than plastics, the aluminum reduces deformation by 40%, thereby reducing warranty returns due to internal contact.
- By reducing weight by as much as 80g, the aluminum support can reduce CO₂ emissions by up to 1.2 kg over the course of 150,000 km travelled by the vehicle.



The design of this durable bearing is now technically mature enough for industrial scale-up in the near future for both the original equipment market and the aftermarket.

Compact bearing



The electrification of the automotive market also imposes new technical constraints that are forcing manufacturers to revise and optimise their products. This is true of NTN, which is working on a new design for a more compact wheel and CVJ bearing assembly.

With extensive experience in minimising axial dimensions to improve the steering angle, NTN must adapt to changing vehicle design architecture, especially for electric cars. The latter have an electric powertrain, the width of which severely limits the length of the drive shafts, thereby significantly impeding the steering angle. Aware of the stakes, NTN set itself the ambitious objective of trimming 40 mm off the wheel bearing width. To do so, it applied its in-house expertise to redefine the interface between the bearing and the drive shaft, which is usually inaccessible. It also drew on every ounce of its mechanical design know-how to guarantee a bearing whose service life and rigidity would satisfy the market's requirements.

But all that effort was not in vain. Completed and tested last year, the prototype's architecture reduces the axial dimension by 35 mm, which can increase the vehicle's steering angle by up to 3°. This new bearing is designed for dedicated EV platforms. When used on small cars, however – whether powered by electric motor or combustion engine – it also makes it possible to achieve an extremely short turning radius, which is clearly advantageous for maneuverability.

Continuing along this completely disruptive path, NTN is currently studying an upgraded design of this bearing assembly that further reduces its weight by 500 g and decreases its outer diameter by 10 mm. The prototype is scheduled for completion in 2023. By continuing to work on significantly reducing axial dimensions to improve the turning radius of new vehicles, the Group will open up the realm of possibilities for its customers when designing vehicle gear trains.

A special ball screw initiative

There's no doubt whatsoever now, the automotive market is undergoing a transformation to electric and self-driving vehicles. This transformation entails the electrification of certain power assistance functions which have heretofore been hydraulic or pneumatic and the development of electric linear actuators. The ball screw is a major mechanical element of those actuators. It plays a key role in the precise conversion of a rotational motion to a translational motion with excellent efficiency, large load-bearing capacity for its compact size, and a service life that will withstand several million cycles. Specifically, the ball screw increases the response, reliability and precision of the actuator all while minimising the consumption of electrical energy.



The ball screw has existed for nearly as long as the bearing, and NTN is a provider of standard products for industry. But the ball screw is rarely used for the systems in IC engine-driven vehicles. It is beginning to appear in some vehicles since the development of electric power steering systems and will become indispensable for braking systems, specifically in electric and self-driving vehicles. Nevertheless, standard ball screws cannot adequately address these new technical and economic needs: special ball screws must be designed to optimise package size and interfaces – to combine functions, for example, and to extend the manufacturing ranges.

NTN has identified a strong potential on the electric vehicle market and is positioning itself by developing specific application products. The Group has already initiated several projects in partnership with automotive suppliers stipulating precise specifications for clutch, gearbox, steering and braking system components. Prototypes are undergoing advanced testing at customer facilities and plans call for series production to begin in 2026.

NTN also wants to develop operations based in France that favour a short supply chain. To that end, it will make major investments in product and process R&D in the coming years, essentially in the Haute-Savoie region of France. This project will be financed in part by the French government within the framework of France 2030.



NTN Europe

A more coherent approach.

Formerly known as NTN-SNR, NTN Europe is the European branch of NTN Corporation. That branch manages and develops all of NTN Group's activities in Europe, South America, Africa and the Middle East. With its 15 production plants and the 430,000 bearings they manufacture each day, NTN Europe offers the capacities of a global player to its partners.

NTN Europe thus stakes its claim as a global leader in wheel bearings, CV joints, timing belt pulleys and suspension components, and in the associated services and training programmes. The manufacturer creates, develops and commercialises its products, and is renowned for the quality of the latter. The NTN and SNR brands are benchmarks, in both OEM markets and the aftermarket. NTN Europe accompanies all the major players in the market and collaborates with the world's largest equipment manufacturers and suppliers.

A Group guided by human values.

Inspired by human values and a sense of responsibility, NTN Europe has a culture of proximity and commitment that stems from its human and technological legacy. The European teams develop specific solutions to support issues experienced by their customers, working in the

spirit of dialogue and mutual progress. Emphasizing transparency in its relationships with customers, suppliers, and internal teams, this sense of partnership also determines the company's approach to social, environmental and quality issues.

○ NTN in Europe

1
billion euros
in turnover.

3 %
of turnover
in R&D.

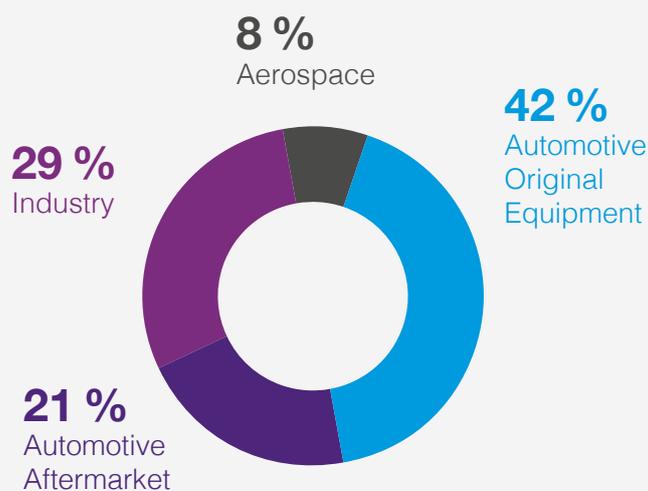
20 %
of global
turnover.

More
than **6 500**
employees.

15
production
plants.

*end of March 2022

○ Breakdown of turnover from March 2021 to March 2022 by Business Unit



Highlights of 2021.

After a tumultuous 2020, the Japanese Group, which closes its books at the end of April, posted a turnover of 165 million euros in Automotive Aftermarket in 2021. Enough to return to pre-pandemic levels.

Specific market trends in this sector vary according to the territory in question. In France, the Group posted excellent growth of +10% versus 2019. Central Europe distinguished itself with strong growth in its respective interior markets. In Poland in particular, limited air traffic combined with the low number of new cars sold in the territory favoured the used car market and the automotive aftermarket. NTN took advantage of this situation through the availability of its products, which enabled it to be responsive and thereby

gain market share. Germany maintained its momentum relative to Turkey and Eastern Europe, both of which posted good performance. Finally, Algeria encountered some difficulty arising from problems associated with import regulations in a tense geopolitical environment. In 2021, the pandemic also caused shortages and somewhat increased the price of raw materials and transportation affecting the automotive industry. All of the players were forced to pass that price increase along to the market, although many of them, including NTN, tried to absorb part of it. In parallel, though availabilities had not yet returned to the pre-pandemic levels, the NTN teams relied on production that was essentially localised within Europe to ensure daily deliveries.

Three product families driving innovation.

NTN maintains its position as an automotive market leader by relying on its ability to innovate and on its original equipment experience to continuously develop its product ranges. For fiscal year 2022, the Group intends to create nearly 600 new part numbers across all product families.

Powertrain



With our three production plants (Iwata and Nagano in Japan and Mettmann in Germany), NTN Europe positions itself as a major player in the engine timing and auxiliary segment. We produce more than ten million pulleys and more than 40 million bearings for pulleys applications every year – all 100% inspected and tested. Our expertise in this field also enables us to develop new products for future markets.



Anaïs LE FOULER

Product Line Manager – POWERTRAIN Range
Automotive Aftermarket NTN Europe

○ New range of electric water pumps

In Europe, 24% of all vehicles on the road today are already plug-in hybrids, hybrids, or all-electric vehicles – and the most electrified continent is not about to stop its transition any time soon. In 2030, electric vehicles are expected to comprise from 18 to 26% of all motor vehicles in the world. With this in mind, NTN launched an all-new range of electric water pumps in June 2022. It comprises a small line of 5 strategic part numbers for OE-quality main water pumps, with which NTN aims to establish its reputation by covering 60% of the European market corresponding to 243 applications of the BMW, Toyota and Lexus brands.



With very ambitious plans for this still-emerging electric vehicle market, the manufacturer will continue to develop its expertise by gradually extending its range in coming months. It aims to have its range achieve 80% coverage by the end of March 2023.

Source: "Making Every Part Count," McKinsey & Company, May 2021

○ Coming in fiscal year 2022 – 2023

Along with its electric water pump range, NTN will also unveil about 150 other new part numbers in the POWERTRAIN family by March 2023. The manufacturer is focusing these developments primarily on its timing belt kits with water pump and on its auxiliary kits. In that context, a new KAP range (auxiliary kit with water pump) will be created and the existing chain kits range will expanded significantly.

Chassis



On the aftermarket, NTN Europe's Chassis segment carries one of the most complete lines of wheel bearings, wheel speed sensors, brake disc kits, suspension kits and CV joints. Implementing our approach to safety through the quality of our products and our field experience, we fully satisfy the expectations of our customers and repair professionals: with new tutorial videos, a line of specialised tools, access to constructor manuals, and the development of new product ranges.



Carole BERWALD and Jonathan MORENO

Product Line Managers - Wheel, Sensor, Suspension and DRIVELINE Ranges
Automotive Aftermarket NTN Europe

○ Launch of new CVJ references

In view of the growing demand for OEM-quality drive shaft kits, boot kits and CV joint kits, NTN has made the strategic decision to accelerate the development of its already comprehensive product range. Within the CVJ market, NTN uses its knowledge and the technical expertise gained over the course of many years. The world's second largest original equipment manufacturer and one of the leaders in the aftermarket today, the Group produces more than 40 million CV joints per year in Europe, Asia and the USA.

Already well-established in the Europe-Middle East-Africa region, NTN expects to consolidate its presence in the market as a result of this major expansion. More attractive and competitive than ever, this range comprising more than 900 parts enables the manufacturer to address the automotive aftermarket even more effectively by covering both recent and older applications.



Romain PETELLAZ

Product Line Manager - CVJ and Truck Ranges
Automotive Aftermarket NTN Europe

Among the 280 new multi-constructor part numbers, NTN offers 136 drive shaft kits, 80 boot kits and 64 CV joint kits. Together these additions represent a 54% increase in the range. Specifically, they include some Top part numbers that many customers have been waiting for, particularly in Europe. This directly supports NTN's goal of becoming one of the leaders on the CVJ market within the next few years. To achieve that goal, the manufacturer will continue to expand this range, specifically with the addition of 250 new part numbers, raising the total to over 1,000 part numbers in 2023.

Always mindful of the need for responsible, eco-friendly solutions, the Group is currently studying the feasibility of a re-manufactured CVJ line. That project is part of the increasingly prominent circular economy strategy within the company.

Driveline



Now more than ever, adopting an approach that favours renovation over disposal is one of the challenges facing society. Gearbox renovation is a prime example. The NTN and SNR product range guarantees original equipment quality, durability and reliability for our customers.



Gearbox bearings and clutch release bearings play a critical role in the correct operation of the transmission. With that in mind, NTN not only develops OEM products and parts for the car manufacturers, but also makes them available to the aftermarket. As a result, repairers are sure to benefit from a product with OEM quality and reliability as well as excellent durability and performance, along with assistance through technical support. With more than 550 part numbers in its range, NTN produces nearly 160 million clutch release bearings and gearbox bearings per year to meet the demands of the market.

Trucks

By March 2023, NTN will also considerably expand its standard range dedicated to heavy goods vehicles. Some 50 new multi-origin wheel bearing, transmission bearing and alternator bearing part numbers will be added to the catalogue. In parallel, a new “preset hub” comprising a bearing/hub assembly is under study: the goal of this new product line is to make it easier for repair technicians to work on these vehicles and parts.

Services and training

○ Six Qualiopi-certified e-learning modules

To fill any knowledge gaps concerning NTN and SNR products and address serious technical issues, NTN developed six e-learning modules for distributors. The online training programme’s objectives include reinforcing their knowledge so they can adapt to changes in the profession and teaching best practices. To reach all customers and partners of the Group, the six modules are available in five languages. Two more modules will be added in the next few months.

NTN also continues to develop its catalogue of webinar-based training courses. The next one, which will examine problems encountered with the 1.2-litre PureTech engine, will be available soon, and four others will follow over the course of 2023. They will focus in particular on problems of:

- engine timing, especially the Subaru Boxer,
- tightening torque with the elongation of the screws,
- ASB signal control using the tester card,
- wheel bearing replacement on electric vehicles.

○ Tooling range

To provide the most complete support possible to repair professionals during their work, NTN collaborates with several well-known tool suppliers across Europe. Working alongside Hazet in Germany, Austria and Switzerland, and together with CLAS throughout the rest of Europe, the Group continues to develop the range of tools that mechanics need to install and remove its products – tools specifically designed to best address their challenges.

○ A digital experience

In the digital age, NTN wants to offer its customers a new experience by creating a virtual showroom. Accessible via computer or tablet, the French version will be available at the end of September. Very soon thereafter, it will be deployed in the nine languages of the Group for worldwide coverage. An attractive showcase for the manufacturer’s know-how, this tool allows customers to discover or rediscover its large product range in great detail along with its latest innovations. A virtual hostess welcomes visitors to the platform and guides them to the separate Powertrain, Chassis and Driveline modules. Soon it will also be possible to take 360° tours of some of the production plants.

To reach both repair professionals and car enthusiasts, NTN recently established a partnership with the YouTube channel “Ma Clé de 12” (French for “My 12-mm spanner”). Under this arrangement, the manufacturer supplies parts and valuable advice used to produce technical tutorials on one or more types of vehicles. Broadcast starting from October 2022, these videos are a good way for NTN to disseminate its knowledge and technical tips.

NTN – a Group with global reach

100 years of passion and expertise.



NTN

1918

Creation of NTN in Japan by Noboru Niwa and Jiro Nishizono.

1986

Entry of NTN in the aerospace market.

2007

Entry of NTN in the capital of SNR ROULEMENTS.

2008

NTN becomes majority shareholder with 51%.



SNR

1918

Creation of SRO in Annecy by Jacques Schmidt.

1944

Acquisition of SRO by Renault. Creation of SNR (Société Nouvelle de Roulements).

1959-75

Creation of the Meythet, Seynod, Argonay, Cran and Alès sites.

1985

Change of company name: SNR becomes SNR ROULEMENTS. Establishment in Europe and the United States.



NTN Europe

2010

SNR officially becomes NTN-SNR, subsidiary of NTN in Europe.

2018

100th anniversary of NTN.

2020

NTN is committed to continue making the world Nameraka.

2021

Change of identity, NTN-SNR becomes NTN Europe.

A global Group...

With a wealth of experience spanning over 100 years across a wide range of sectors such as industry, aerospace, and automotive, NTN knows how to adapt to market changes, thanks to its cutting-edge technological innovations. The Group relies on values that reflect its performance and its identity in the eyes of its customers, suppliers and teams the world over.

NTN Group designs and manufactures high-quality products marketed under the brands NTN, BCA, BOWER and SNR. It has a global presence, with 73 sites and 73 sales offices and now employs more than 24,000 people. At the close of its fiscal year in March 2022, the Group posted a turnover of 4.9 billion euros.

○ NTN in the world

4,9
billion euros
in turnover.

More than **24 000**
employees.

73 production
plants.



... adapted to growth.

2021: The year of change

Mindful of changes wrought by innovation, the Group continuously adapts itself to satisfy its customers' expectations and ensure that they reap the benefits of the latest technology. To help the world keep moving and evolving, NTN is striving to make more efficient use of energy. It is accompanying each of its partners towards a more fluid, more mobile and more harmonious future – to **make the world Nameraka**.

This new philosophy is inspired by Nameraka, a word of Japanese origin. It combines a technological dimension, the mastery of friction, with a certain view of the world, of fluidity of movement, and of harmony with the environment. It thus reflects the Group's know-how, leadership and vision for the future as it asserts itself as an international, global company.

No matter the market segment (industry, aeronautics, automotive, cement, wind power, rail, machine tools, textile machinery, agricultural machinery, etc.), innovation lies at the very core of everything the Group does. In September 2021, to align its image with its positioning, NTN reaffirmed its identity by adopting the slogan **"Make the world Nameraka"**.

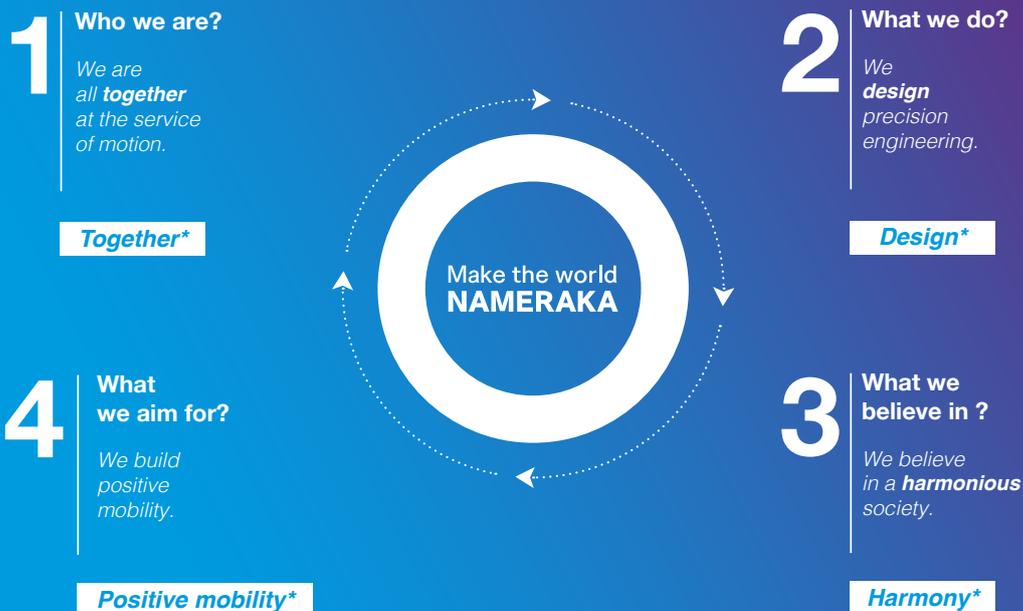
Shared throughout the Group the world over, this stance enables it to position itself as a trailblazing and committed Group striving to innovate for a better future. At the same moment, NTN-SNR redefined itself as NTN Europe.



Make the world **NAMERAKA**

In parallel, to help each Business Unit adopt this philosophy, NTN jointly reflected on the topic in discussions with each of them. This slogan was thus laid out in baselines to enable each BU to embody the Group's vision on a daily basis. For the Automotive BU, **"Make the world a better road to drive"** reflects this desire to satisfy the demands and meet the challenges of tomorrow by making roads safer, more efficient, more reliable and more eco-friendly.

○ Mindful of making the world Nameraka, NTN bases its values on 4 pillars:



NTN modernizes its buildings

NTN is undertaken the modernization of its buildings in Annecy, France in order to bring together on a single site its innovation, R&D activities and the Industry, Automotive and Aftermarket teams. NTN will build itself a brand new headquarter for 2025. Its striking architecture will reflect the “Nameraka” identity and the Group’s image. Its exterior design will be just as innovative as its interior, where the conceptual layout reinvents the way we collaborate in a

friendly, functional and responsible work environment. Bringing the teams and the hierarchical levels closer together will result in more varied interaction and a richer exchange of ideas and information, thereby encouraging creativity. At the same time, diversifying the work spaces and digitalising the tools will make the teams more effective.



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