

OUR VISION: DELIVERING THE **ULTIMATE** BEARING EXPERIENCE



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OUR VISION: DELIVERING THE **ULTIMATE** BEARING EXPERIENCE



We create solutions built on innovative bearings that solve our customer's challenges. Beyond supplying world-class bearings, our purpose centers on servicing our customers by anticipating their needs, creating solutions and providing the highest level of service.



NTN's company vision is "to provide the ultimate bearing experience in Canada." We are a company of promise and possibilities. Each day represents a fresh opportunity to share our vision and live our purpose.

The goal of our vision is to become an admired brand, an innovative company, and a customer-centric company. For this, we dedicate our efforts to innovation and shared value with our partners, and our great people.

Our goal is to deliver world best products and services through our passion for innovation and optimal operation.

We have a "can do" attitude that inspires top performance from everyone. We encourage collaboration, commitment, and embrace challenge.

We aim to contribute to what is called "**Nameraka**" or smooth society in Japanese, the meaning of which is making the world run smoothly with the NTN Spirit Tree as our guiding philosophy.

Contributing to a Nameraka World

The NTN Spirit Tree shapes our commitment to a sustainable future and infuses everything we do: relationships with our customers and our colleagues; and resources for our community and environmental initiatives.

Our SPIRIT Values guide the way we support our customers and work with one another.

Challenge ►

We are passionate about our business and our brands. We enrich our lives by challenging passionately, acting with initiative and continuing to grow. We promote and implement creative and innovative ideas and solutions.





Meet Francois Pellerin, an Inside Sales Representative at NTN Canada's Montreal location. Our mission to deliver "the Ultimate Bearing Experience" relies on the work that Francois and all of our passionate employees do every day.

Francois joined NTN's bilingual customer service team more than 35 years ago overlooking inside sales, tech support, and customer care. Francois spends his days helping NTN customers find answers to all of their most burning questions.

Francois is constantly checking with current and past clients to ensure that we are supporting them in the best way that we can. His favourite thing about working for NTN is our strong employee culture and his colleagues. "At NTN, there is such a great opportunity to develop and thrive, with leaders that always support you." Outside of work, Francois is passionate about travelling. He places an emphasis on

global adventures in exotic cultures, having travelled recently to India and Thailand. Next on the list is a trip to France with his wife. For Francois, travelling is about enriching your own life, making memories, and creating life-long friendships.

Of all the things that Francois loves about his job, his favourite part is having real conversations with people and understanding how the solutions we provide truly help them in their processes. "Being an Inside Sales Representative at NTN, I get to have so much interaction with our customers, and I feel blessed to hear their experiences and insight. It's really fun to get a call from a customer who is pleased with our service, as this reminds me of the importance of what we do here. I really value the relationships I have with clients and going above and beyond to ensure their needs are met."

We are proud to have Francois with us and look forward to his continued success in the future.



Collaboration ◀

We show respect and value all individuals for their diverse backgrounds, experiences, styles, approaches and ideas. We take care of the natural environment and maintain coexistence with the local community.



Commitment ◀

We strive to delight and serve our customers through the high quality of our products and services. We improve the lives of people around the world through our work.

NTN strives to deliver the Ultimate Bearing Experience by being a world-class bearing producer, supplier, and above all, by supporting the success of our customers.

Through challenge, collaboration, commitment and a focus on success, we have created a vibrant company culture where people can thrive and success can flourish. We put all our company resources at the service of our customers and partners, from our production facilities, experience and network of experts, to our knowledge, energy and the innovative spirit of our people.

GREEN

INITIATIVES AT NTN CANADA

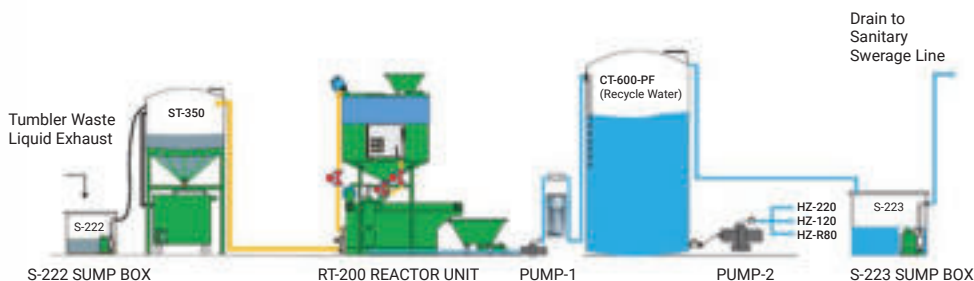
At NTN we are committed to identifying the best practices and developing standards for energy and water efficiency across our facilities.

› LED Lighting

Last spring, all interior lights at NTN Canada's manufacturing facility were replaced with LED lights. The new lighting system provides increased illumination throughout the facility while using less electricity. The new lights consume only 11 watts compared to traditional fluorescent bulbs which consume 32 watts. Not only do the lights use less electricity, but the increased illumination also improves work conditions. The upgrade has reduced electrical consumption by 974,352 KWH resulting in annual cost savings of \$118,000.

› Innovative Water Recycling System

AUTOMATED WASTE WATER TREATMENT

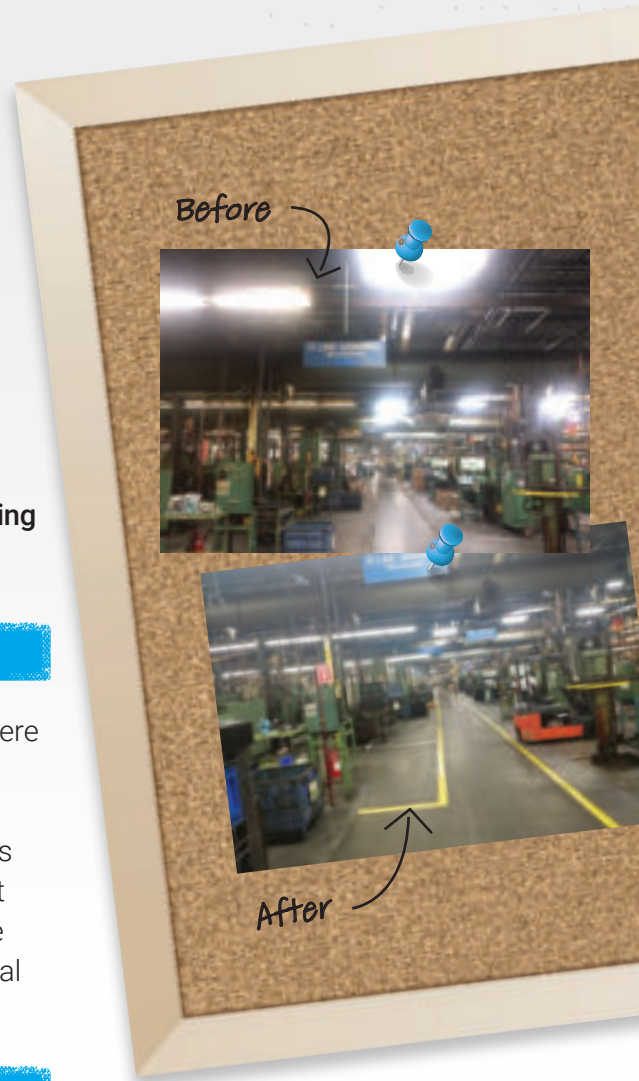


NTN's Canadian Manufacturing Facility has recently increased the size of its tumbler water treatment process so that recycled water can be used for tumbling of Rocker Arm Bearings (RAB), using both large

and small tumblers. The expansion of the water recycling process has reduced water consumption by approximately 70% from ~46,000 Gallons per month to 13,500 Gallons per month.

Additionally, the water treatment process has improved the quality of the liquid waste so that it now meets the requirements for disposal to the sanitary water system.

Previously these wastes were collected, contained in the coolant room and transported to appropriate treatment disposal sites. As a result of the recycled water improvements, oily waste water disposal has dropped by 1.1 million litres per year generating over \$88,000 in annual savings.



NTN CANADA HELPS YOUNG PEOPLE **BUILD FUTURES FREE OF HOMELESSNESS**

eva's 25

June 20, 2019 NTN Canada was the volunteer sponsor of Eva's Home for Life Auction, held at the Toronto Evergreen Brick Works. The night's event raised over \$250,000 in support of young people building futures free of homelessness. The funds will be used to provide shelter and caring support for 508 young people, so they can dream big and discover their potential.

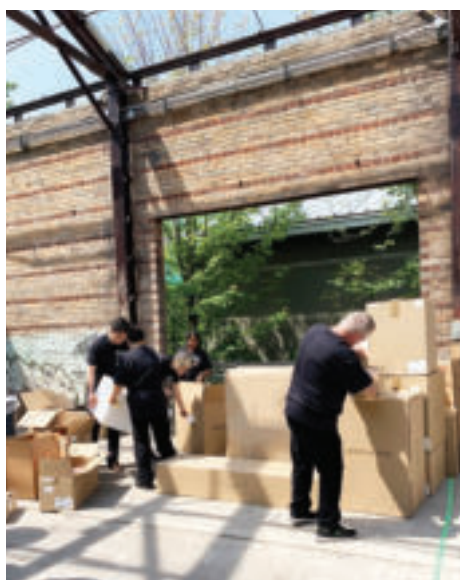
As the Volunteer Sponsor of Eva's Home for Life, more than 100 NTN volunteers worked together brilliantly on all kinds of tasks from assembling new furniture, to working with the interior decorators to set up exhibits, all the way to cleaning, sweeping and tagging custom-made houseware items. With NTN's help the venue was transformed into a breathtaking marketplace filled with exciting virtual homes created by



top Toronto designers, showcasing unique furniture and housewares. Plus, everyone enjoyed fabulous food and drinks, along with a curated exhibit of art made by youth residents at Eva's shelter and transitional housing facilities. An audience of over 400 attended the event and bid generously on items to help fund safe shelter, new opportunities and bright futures for homeless youth.

Eva's serves youth (16-23) who are experiencing homelessness or are at risk, operating three shelters in Toronto, and was founded through Eva Smith's advocacy, a philanthropist who challenged the traditional stereotype about who is homeless. Eva understood that it was critical to keep youth connected to their schools and communities.

Special thanks to all of the NTN Canada volunteers who gave their time generously to support this great cause. NTN will continue to support initiatives to help deliver shelter, new opportunities and brighter futures for disassociated adolescents and young people.





THE AWARD-WINNING SPAW PRODUCT LINE

IS A GREAT EXAMPLE OF THE INNOVATION AND EXCELLENCE IN PRODUCT DESIGN THAT NTN DELIVERS TO THE MARKETPLACE.

NTN produces a wide range of bearings for heavy industry and our team's goal is to provide customers with the Ultimate Bearing Experience.

Extremely contaminated environments often make equipment subject to premature failure. NTN offers a complete range of mounted units but by far, our premium problem solver is the award-winning SPAW Mounted Roller Bearing.

In 2017, NTN Bearing Corporation received the Bearing Specialists Association's Manufacturer Excellence Award for the NTN SPAW Mounted Roller Bearing. The award was presented to NTN for best practice in innovation and excellence in product design and technology.

With NTN's SPAW/SPW series, NTN sets a new standard in performance, withstanding the most demanding conditions with less downtime and maintenance.

The NTN SPAW is a one-piece, solid ductile iron housed bearing that dimensionally interchanges with a standard split block SAF style bearing unit. Our SPAW reduces

installation time by over 60% when compared to the SAF style by eliminating the use of feeler gauges to set the bearing clearance and is supplied fully assembled making it shaft ready.

The SPAW features a unitized MX-W ULTAGE bearing insert that has an integrated spring-loaded contact seal allowing for up to $\pm 1.5^\circ$ of misalignment without gaps in the contact seal to help keep contamination out. NTN's SPAW arrives completely assembled and properly lubricated, eliminating on-site bearing assembly.

Additionally, the SPAW bearing insert and adapter assembly are phosphate-coated to minimize corrosion. Optional open and closed ductile-iron end covers easily bolt onto the housing to provide maximum protection in the harshest environments.

The bearing inner and outer rings are also phosphate coated to resist corrosion which means the bearing seals run directly on the precision ground phosphate coated bearing inner ring.

DID YOU KNOW THAT OVER 50% OF BEARING FAILURES OCCUR FROM CONTAMINATION?

Contaminants in a bearing drastically reduces performance. In most heavy-duty units, the seals actually run on the shaft and when the shaft gets worn or corroded, the seal becomes ineffective and allows contaminants to enter the bearing.

The MX-W insert can also be easily changed out with the simple removal of snap rings and with each new fresh replacement, the seal has a new ground and phosphate protected surface to run on.

Keep in mind that these units are also hardly ever installed in clean environments. When you have an open housing or bearing installation, it's extremely hard to keep everything clean. With NTN's SPAW/SPW series, you can even install these in dirty environments or have other fabrication going on around you without concerns of bearing contamination.

Most installations can exceed existing performance with the MX-W insert seal alone; however, NTN also offers additional cap covers for added protection against contaminants. The covers add an additional cavity which can be filled with grease to create a seal for extreme conditions.

The NTN's SPAW/SPW series housings are made of a one-piece ductile iron material as standard. No chance to mix-up caps and bases, and ductile iron has a breaking strength approximately twice that of cast iron.

The unit is an adapter taper locking style unit which offers the best positive locking and is available in various common industrial shafting sizes. NTN M1 phosphate coated adapters are also supplied with this unit to resist corrosion and ease drive up assembly. Each unit is supplied in a floating position and can be converted simply by moving one fixing ring into an inner groove to create a fixed unit.

HOW DOES THE SP/SFC HEAVY DUTY SERIES MAKE LIFE EASIER?

1. NTN provides the SP/SFC series fully assembled. You only need to order one part number.
2. NTN has already filled the sealed MX-W insert with a premium grease in our factory. The grease fill is guaranteed to be clean and filled with an accurate and consistent quantity.
3. The seals are already installed directly with the bearing. There is no need to install or worry about ordering additional seals. New seals are also installed with each

replacement insert.

4. Installation instructions are provided with each unit which outline a simple installation nut rotation from the initial positive contact starting point for each shaft size. No lengthy feeler gauge measurements are necessary during installation.
5. Each unit can be converted to a fixed or floating unit. There are no additional fixing rings to install or order.
6. Best of all, bearing components are minimized and installation is simplified making it quicker to install.

NTN has many real-life experiences where existing service life is extended from months to years when implementing the SPAW/SPW series. Contamination is the common element to bearing demise and one of the primary advantages to this series success is its sealing capability and the design principle to "Keep Dirt Out." Increased life and installation ease keep your operation running and cut your maintenance costs.



For more information,
visit www.ntn.ca and download NTN SPAW, SPW and SFCW Type Cat. C-2600-IV.



NTN'S SPAW/SPW

HEAVY DUTY MOUNTED UNITS KEEP TRANSFER TABLE ROLLING

A major Canadian producer of dimensional lumber was experiencing production-crippling bearing failures on their log yard transfer table. The repetitive failures on this critical equipment were causing very costly downtime at a rate of over \$11,000 per year, impacting production and requiring a maintenance crew of six 30 hours over a weekend to rebuild each time. NTN's engineering and sales support team ran a comprehensive diagnosis of the mill's transfer table troubles. They discovered that the bearings were only lasting an average of two years due to the steady stream of dirt, sand, rain, ice and snow that the transfer table was exposed to on a regular basis.

The NTN Solution

NTN's team recommended that the mill switch to heavy-duty mounted roller bearing units with end covers, the C-SPW Series. SPAW/SPW heavy duty mounted units feature a sealed spherical bearing that offers superior protection in heavily contaminated environments. Additionally, end covers provide extra bearing seal protection

from the massive amounts of heavy debris buildup.

The Result

The NTN solution lasted six times longer! The C-SPW heavy-duty mounted roller bearing units with covers successfully ran without a single failure, compared to the original bearings that were failing every two years. In fact during the next transfer table preventative maintenance rebuild, the C-SPW bearings were still operable after 12 years.

The increased uptime and reduced maintenance resulted in over \$130,000 in savings over a 12-year time frame. The customer was so impressed by the improved performance that they only use NTN's C-SPW bearings on this application.



VALUE ADDED BREAKDOWN

Increased Bearing Life
\$70,000*

Reduction in Maintenance
\$30,000*

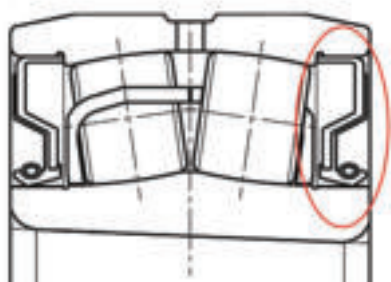
Miscellaneous Savings
\$32,000*

Documented Cost Savings
\$132,000*

Annualized Cost Savings
\$11,000*

* All monetary amounts listed in Canadian dollars

ADDING GREASE TO HOUSING COVERS HELPS PREVENT CONTAMINATION



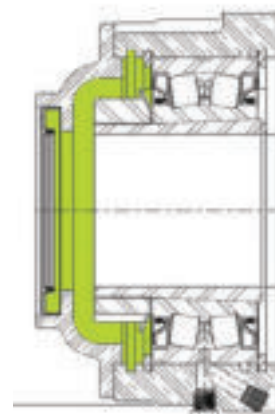
(Fig. 1)

Outdoor conveyor systems see some of the harshest environments of any bearing application. These conveyor systems commonly use heavy-duty spherical roller bearing SAF mounted units, utilizing split cast iron housings and various seal configurations. Even with all of the exotic seal configurations, these heavy duty bearing units still see damage resulting from either environmental or application contamination.

In the application, the build-up of the transported material on the bearing face (Fig. 1) will eventually lead to seal wear and contamination ingress. Once the contamination gets into the bearing it is only a matter of time before failure occurs.

One way NTN has helped is with the development of the sealed SPAW heavy-duty mounted unit. The SPAW, a drop in replacement for SAF units, has integrated spring-loaded seals to the bearing (Fig. 2), a ductile unitized housing, phosphate coated bearing and adapter sleeve, as well as the options for open and closed covers. NTN has seen great success with this bearing in conveyor applications utilizing the covers and adding grease in the cavity between the bearing and the cover (Fig. 3).

The grease dam acts as a trap for contamination, thus preventing it from reaching the bearing seal face. Keeping contaminants out of the bearing will lead to longer bearing life and reduced downtime, meaning significant cost savings to the customer.



(Fig. 3)

(Fig. 2)



GIVING BACK: CREATING MEALS FOR THOSE IN NEED



NTN Bearing Manufacturing Canada in Mississauga joined forces with Eden's Food Bank for Change in giving back to the

community. NTN volunteers had an amazing time learning some cooking skills, how a food bank operates, and most importantly creating meals for those in need. The group produced homemade food to be distributed to local, low income families in our communities.

Eden Food for Change serves the community of western Mississauga by providing emergency food relief to up to 500 hungry families a month, and usage of the Food bank continues to rise. They rely on corporate and individual donations along with sponsorships to continually provide healthy meals. It was a powerful experience helping a food bank with this kind of reach; it's obvious that volunteering makes a difference in our communities.



EDUCATIONAL PARTNERSHIP

Although unemployment is at its lowest point in decades, the industrial distribution market is feeling the pinch for skilled workers in bearing and power transmission related customer service roles.

Fewer people have been entering the trades and NTN together with Sheridan College has identified this as an opportunity to create a Certificate of Industrial Distribution program.

NTN will partner with Sheridan College to construct a joint curriculum and provide training to instructors who will be dedicated to educating people interested in entering the bearing transmission field.

A huge thank you to Sheridan College for their leadership and for providing future students with real world bearing experience. This initiative will put more people to work and provide for our future workforce!





NTN BEARING FINDER **EXCEEDS 39,000 PART NUMBERS**

Bearing Finder is hosted on a proprietary platform that offers a customizable part search tool, interactive and downloadable CAD illustrations, comprehensive part interchanges, and exhaustive data sets. It's part of NTN's industry-leading suite of training and cataloging entities, focused on the company's mission to provide the ultimate bearing customer experience.

NTN competes with the biggest names in the bearing industry. If a customer is looking to replace a Timken, SKF, or Koyo bearing, NTN most likely makes a drop-in replacement for it. That's why we launched Bearing Finder, the most adaptive and complete digital catalog in the industry. Simply search by either our competitor's part number or ours directly.

The Bearing Finder digital support platform is designed to aid distributors, design engineers, and end users in finding the perfect bearing to use in any application, with access to over 39,000 cataloged part numbers. This industry-leading technical support tool is designed to connect end-

users of our products with the resources they need to make fast and accurate buying decisions.

Since the launch of Bearing Finder, NTN has added 6,445 standard mounted units, 4,264 needle roller bearings, 437 Ultra-Class™ mounted units, and 309 heavy-duty mounted units to the platform.

To learn more about Bearing Finder,
go to <http://bearingfinder.ntnamericas.com>

TIP



NTN uses a variety of prefixes and suffixes to help identify critical features of our bearings. Some are standard throughout the bearing industry, while some are not. If you're having difficulty finding a direct interchange, try reducing the number of characters in your search.



NTN BEARING TO HOLD COMPREHENSIVE DISTRIBUTOR TRAINING SCHOOL

NTN's relationships with its customers don't end the moment its products leave the production line. NTN offers comprehensive training options to serve each of its customer's needs. The Fall Session of the NTN Distributor Training Program is scheduled for October 22-24, 2019 at NTN Canada's headquarters in Mississauga and on November 5-7, 2019 in Montreal.

This 3 day training course provides an overview of bearings and the bearing industry, and training on each type of bearing NTN manufactures. Breakout sessions are dedicated to individual bearing types and how they

work with specific applications.

Classroom lectures cover generic topics such as bearing basics, lubrication, clearance, fitting practice, as well as handling and storage. Design, nomenclature, and typical uses of each product group are presented in product module format.

To supplement the lectures, class members will participate in several hands-on labs relating to bearing units, tapered bore mounting and radial internal clearance. Evening homework is assigned to reinforce the material presented during the day and focuses on the use of the catalogue and problem solving.



› For more information, contact your local NTN representative or visit www.ntn.ca



NTN CANADA ANNOUNCES LAUNCH OF NTN SNR LINEAR SOLUTIONS



NTN Canada is proud to announce the addition of NTN SNR linear motion solutions to our customer toolkit with the introduction of Profile Ball Rails, Runner Blocks, Linear Shafting, Ball Bushings & Linear Actuators.

Our industry partners will benefit from the experience of NTN SNR, a world leader in linear motion offering the widest range in the market, long-term maintenance free operation and high assembling tolerances.

Our linear motion solutions are designed for maximum performance to meet the demands of the most diverse industry applications from automated assembly to medical robotics, aerospace, automotive, transportation and more. The portfolio is supplemented by effective engineering, all with a great cost benefit for the end user.

Flexibility

our intelligent modular system allows different ranges to be quickly and easily combined

Security & Reliability

we have extensive experience in several areas of mechanical engineering and full operational reviews

Cost Reduction

a modular principle and the breadth of the range offers a single supply source

› For more information, contact your local NTN representative or visit www.ntn.ca



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