



PETE EICH

SUPPORTING DISTRIBUTORS THROUGH TRAINING

Successful companies recognize that people are one of their most important assets. To insure this asset is fully utilized, it is important to provide proper training and tools. NTN has been hard at work to help support your training needs, as well as the training needs of your customer-the ultimate end user.

NTN is pleased to announce that we are adding a new very cost effective web based training program. We began offering this new class in April, which targets new employees and also serves as a refresher for experienced employees. Please see more details inside this newsletter.

With the addition of this class, NTN now offers four different training options;

1. **Web Based Training** – six 1-hour live sessions spread over six weeks covering various types of bearings and nomenclature as well as tools and systems available to aid in their daily work
2. **3 Day Training Class** – held at our corporate office, includes classroom lectures, small group hands-on break out sessions, tour of our test lab, and a tour of one of our bearing manufacturing plants



2007 Session Schedule: June 5 - 7, Sept. 18 - 20, Nov. 6 - 8

3. **Technical Training Unit (TTU)** – mobile classroom (with a hands on training area) that we bring to your facility to conduct a customized training program for up to 10 students per session



Technical Training Unit (TTU)

4. **Customized Training** – at your facility provided by our salesmen and engineers

The feedback we have received from our various training classes has been extremely positive. For the Web Based Training, as well as the 3 Day Training Class, please visit our website to register (ntnamerica.com). For the TTU or Customized Training, please contact your local NTN Sales Representative.



Pete Eich, President
NTN Bearing Corporation Of America

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Fax: (770) 448-6969

GREAT LAKES REGION

1600 East Bishop Court
Mt. Prospect, IL 60056
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1-800-252-8123
Fax: (847) 294-1364

CENTRAL REGION

111 W. Washington St.
Suite 310
East Peoria, IL 61611
Tel: (309) 699-8600
1-800-545-0434
Fax: (309) 699-8670

WESTERN REGION

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TECHNICAL TIPS

GEOFFREY BIDLACK
Applications Engineering
NTN - Norcross, GA

CAGES FOR ROLLING ELEMENT BEARINGS

When designing an application where bearings are utilized, cage selection is crucial. It can mean the difference between trouble-free operation and early failure. Bearings are equipped with precisely manufactured rolling elements. Whether round, cylindrical or spherical in design, these elements will only function properly and provide lasting service if they are separated and positioned properly. This is accomplished with a device known as a cage; otherwise referred to as a retainer or separator. Acting in unison with raceway geometry, the bearing cage also contributes to the proper alignment of the rolling elements. Let's take a look at the three basic cage types.

PRESSED STEEL CAGES

For small and medium sized bearings, pressed cages of cold or hot rolled sheet steel are used. They are standard on many deep-groove ball bearings and are available spot welded or riveted and are widely used in electric motors. These cages offer relatively high strength and are lightweight. To reduce friction and wear they may be hardened or surface treated. For example, NTN part number 6212M2LLBC3P5 features a zinc plate pressed steel cage that allows for higher speed operation. When higher speeds are required, an alternative to pressed steel should be considered in order to minimize friction and heat.

NYLON CAGES

Nylon or "plastic" cages are easy to manufacture, can be molded into a variety of intricate shapes and can be economically produced in mass quantities. Nylon is far superior to metallic materials in self-lubricating properties, resiliency, and corrosion resistance and are widely utilized in automotive and industrial applications. NTN part number 7020T2DTBT/GLP4 is a precision machine tool bearing featuring a nylon cage which allows for higher speed operation. Additionally, lightweight nylon cages provide low friction torque and high rotational speed, limits noise and vibration. Mechanical strength can be increased with graphite or carbon fiber. Care must be taken when using nylon cages because strength may be decreased at temperatures above 120°C or chemical changes may occur when utilized with lubricants containing certain additives.

MACHINED CAGES

In heavy-duty applications where large bearings are utilized, machined cages of structural carbon steel or high tensile cast brass are widely used. However, graphite cast iron or aluminum alloy cages are also available. This type of cage can be found in rock crushing and shaker screen applications where heavy or shock loads are common. NTN part number 22322UAVS2 is a "shaker screen" bearing featuring a high capacity machined brass cage. Machined cages can be used at higher operating temperatures and are unaffected by the mineral or synthetic oil based lubricants normally used for rolling bearings. They also stand up to organic solvents used to clean bearings. They are very resistant to corrosive attack. Cage selection is an integral part of the application design process.

Fortunately, there is a cage available to handle the many and varied demands placed on precision bearings. When informed choices are made, long lasting, trouble free operation is the result.

If you have any service issues you believe are related to the type of cage you are using or any cage questions in general, please contact NTN's Engineering Dept at **1-800-323-2358** or via our corporate website **www.ntnamerica.com**



PROGRAM LAUNCHED APRIL 26, 2007

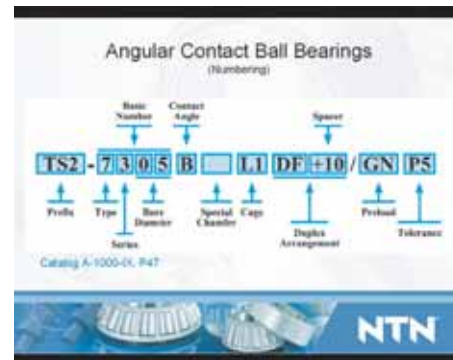
NTN Bearing Corporation Of America is now offering a new web-based training program designed specifically for entry level inside sales personnel that work at authorized NTN distributors in the United States. The training consists of a series of six 1 hour live web-based seminars.

The training subjects include:

- Module 1** – Deep Groove Ball Bearings
- Module 2** – Cylindrical Roller Bearings
- Module 3** – Tapered Roller Bearings
- Module 4** – Mounted Units
- Module 5** – Angular Contact and Precision Bearings
- Module 6** – Spherical Roller Bearings and Heavy Duty Mounted Units

Each training module will include the following information:

- Product Description and Explanation
- Part Numbering and Nomenclature
- Support Systems – NTN Web site and DOL
- Industry Interchanges
- Catalog Information / Review
- Common Applications
- Who to call for technical support
- Q & A



One module will be presented each week, allowing a new employee to complete the series in only 6 weeks. A new training series will be started on a regular basis (typically every 2 weeks) as customer demand requires. Prospective students will need to sign up 2 weeks in advance to allow time to be mailed a starter packet. A sign up application form is available at the NTN America website (<http://www.ntnamerica.com>).

Web-based training will be conducted by NTN's Engineering Department utilizing Conference Now. Students will be stationed at a computer at their work location, with Internet access and a telephone. They will dial into a common number to connect to a conference call type connection. Additionally, using their computer web browser they will navigate to a site and be able to view the computer screen of the presenter. The presentation will be primarily PowerPoint based. It will also be interactive to allow the presenter to break out to web sites as appropriate for the training to demonstrate electronic tools that are available to our customers (e.g., ntnamerica web site, DOL, etc.) At the end of each training module, the student will download a short post test that will reinforce the concepts trained in that module. The exam will be submitted to NTN via fax or email to be graded. At the end of the series, each passing student will receive a diploma.



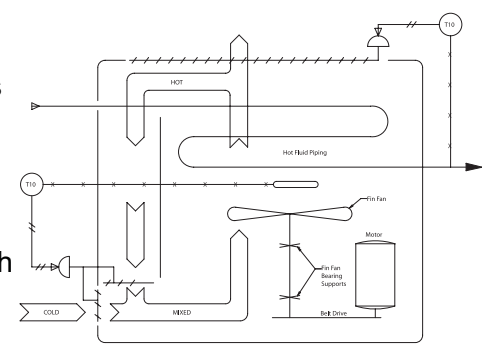


PETER LORENTZ
Sr. Product Analysis Engineer
NTN - Wheeling Test Lab

MODIFIED SPHERICAL ROLLER BEARING UNIT SOLVES REFINERY FAILURES

In the power transmission industry, where it is often difficult to shake traditional approaches to problem solving, NTN has offered an innovative solution to a long-standing problem at a Memphis oil refinery. Fin fan bearing reliability on vertical shafting presented the challenge and NTN provided the answer, utilizing some “outside the box” thinking.

Fin fans are used to cool various hot fluids flowing through complex pipe systems prior to final storage in tanks. Typically, horizontal pipes transporting the fluid lay parallel near the top of a plant exposed to the elements. Fin fans, rotating on vertical shafts, force air between the pipes and act as a cooling mechanism, similar to an automobile fan forcing air through the radiator. In the case of an oil refinery, a series of fans, nine feet in diameter rotate between 80 - 210 RPM, each belt driven by a 10 - 15 HP motor.



Traditionally, a tapered roller bearing style flange unit provides shaft support. The unit is secured to the shaft with collars and the associated setscrews. However, rainwater can collect on the upper surfaces of the flange unit, eventually seeping through a simple contact seal, into the internal bearing components. There are other problems such as inner ring loosening from vibration and the tapered roller bearings unit's limited allowance for misalignment. However this configuration is typical throughout the chemical industry.

Examples of tapered roller bearings showing water contamination and misalignment damage.

Misalignment



Water Damage



NTN went to work, developing a special version of its SFCW-style flange unit with the same bolt pattern and shape as the existing tapered roller bearing unit. This unit incorporates a spherical roller bearing with spring-loaded seals for improved contamination control. Its high load capacity design allows a wide misalignment range, so inevitable mounting errors are not a death sentence when put into operation. Additionally, a phosphate coating is added to all of the exposed metal surfaces for further protection against moisture contact.

The resulting SFCW2215-207B8N1 design (2.7/16 inch bore diameter) has proven itself repeatedly at the Memphis refinery for 2 ½ years without problems. This is a major improvement over the competitors tapered roller bearing flange design that was experiencing breakdowns after only 6 weeks of service.



MIE PLANT

NTN began production at our newest facility, the Mie Plant, in October of 2004. With a new building totaling over 387,000 square feet, the Mie Plant focuses on radial and angular ball bearings, tapered roller bearings and needle roller bearings, adding much needed additional production capacity. With state of the art equipment, the Mie Plant is responsible for developing leading-edge bearing manufacturing methods, processes, machine technologies, and operating practices. The significance of NTN's Mie facility is "a globally competitive plant in quality, production lead time and cost". The goal was to develop a revolutionary bearing production factory that matches the most efficient factories in the world with regard to lead time, lot size, production line flexibility and overall costs, enabling it to be a model for all other NTN production facilities. NTN-Mie is a typical symbol of our challenge to "Monozukuri" (a comprehensive concept of all manufacturing activities), with our supreme technology.



Mie Plant

The new plant is located in the Mie Prefecture close to NTN's first production site, Nishizono Ironworks, which began production in 1918. This location is also home to many of NTN's key suppliers. The Mie Plant is close to the large NTN Kuwana Works Factory (built in 1939), as well as, the Kuwana Engineering Center. This allows the Mie Plant to take advantage of a wide range of engineering assistance from its affiliates and suppliers in the Kuwana region.

THIS PLANT **MANUFACTURES:**

- NEEDLE ROLLER BEARINGS (20-80mm)
- RADIAL BALL BEARINGS (80-270mm)
- ANGULAR BALL BEARINGS (130-440mm)
- TAPERED ROLLER BEARINGS (140-270mm)

PRIMARY **INDUSTRIES:**

- CONSTRUCTION
- INDUSTRIAL ROBOTS
- HEAVY DUTY TRUCK
- GEARBOX

WITH **ADVANCED TECHNOLOGY:**

- HL-ROLLER TECHNOLOGY FOR POOR LUBRICATION
- AS- AUSTENITE STRENGTHENING HEAT TREATMENT



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www.ntnamerica.com



WELCOMES

DENNIS TANRIKULU

Vice President - Aftermarket Sales

NTN is pleased to announce the appointment of Dennis Tanrikulu to the position of Vice President - Aftermarket Sales, officed in the Mt. Prospect, IL headquarters. In this capacity, Dennis is responsible for both Industrial Aftermarket, as well as, Automotive Aftermarket sales. Dennis joins NTN with over 20 years bearing industry experience, bringing an impressive background in sales and marketing of both linear and radial products to OEMs, Distributors and End-Users. The majority of his experience is working mainly with various channel partners in support of the Aftermarket and within our industry, Dennis has been a representative at various industry functions including PTDA, AMTDA and BSA. He is currently a member of the PTDA Employee Development Committee. Dennis is married with 2 children and enjoys golf, playing guitar, snow skiing and spending time with his family.

WE ASKED DENNIS TO SHARE SOME **PERSONAL INSIGHT** ON THE FOLLOWING SUBJECTS...

As the bearing market sees increased pressure from low-cost countries, what do you believe NTN, as well as other manufacturers, will need to do to maintain their position?

In order to meet the customers value proposition, all manufacturers must continue to provide value added service to both their channel partners, as well as their end-users. If a manufacturer only sells on price and delivery, they will ultimately lose their business to the low-cost producer.

With your 20 years experience, what interests you most about the bearing industry?

The bearing industry is a close knit group of people. I did not fully realize this until I came to work for NTN. I have received calls and e-mails from people I have not talked to in years. They have heard about my change and offered their congratulations. Additionally, the people I have met throughout my 20 years have been extremely friendly. Today, many of those relationships have evolved into personal friendships.