



New Hampshire Ball Bearings, Inc.
— A Minebea Company —

inside track

President of Minebea Thanks NHBB for Spearheading Growth

NHBB was honored to have Mr. Takayuki Yamagishi, President of Minebea Co., Ltd., as a venerated guest and keynote speaker at this year's sales meeting in Phoenix, AZ. During his opening address, President Yamagishi reviewed the Minebea Group's current situation and future direction, and outlined the company's expectations of NHBB.

According to Mr. Yamagishi, Minebea's net sales and net income in FY 2007 reached record highs, capping off a strong recovery that began in FY 2005. He credited the improvement to the hard work and dedication of Minebea's employees and to the Minebea Group "returning to the basics of manufacturing and the pursuit of manufacturing excellence."

Mr. Yamagishi spoke of the difficulties facing the global economy, especially the softening United States economy, the slowdown of

consumption brought on by the sub-prime loan crisis, and the rising costs of energy and raw materials. Despite these factors, Mr. Yamagishi expressed optimism about the company's future, saying, "we must have the confidence that, so long as we devote ourselves to manufacturing excellence, produce a better quality product and remain price competitive, we will achieve good business results even during these challenging times."

Turning his attention to the global aerospace industry, Mr. Yamagishi emphasized Minebea's strategy to grow in this market. He noted that, from FY 2002 to FY 2007, net sales for Minebea's aerospace business expanded significantly, increasing the company's market share. Looking ahead, he expressed his belief that Minebea's aerospace business ought to grow at an even faster rate due to its aggressive investment strategy aimed at this market. The company plans to build new facilities in Asia and expand several existing facilities at home (Asia) and in the United States.

According to President Yamagishi, NHBB is a key component of this growth strategy because it represents a majority of Minebea's aerospace business. He expects NHBB to assume a leadership role within Minebea in large ball and roller bearings and to



Mr. Takayuki Yamagishi, President of Minebea Company, Ltd.

work closely with its Asian counterparts in rod ends and spherical bearings, which he acknowledged are very price sensitive.

In closing, President Yamagishi expressed his appreciation for the extremely large role that NHBB has played in the Minebea Group's improved performance. "The Minebea Group must continue to make great leaps forward," he said. "I am confident that NHBB will continue to play a leading role in the coming years." ●

Inside this issue:

Outstanding Service Awards
Nadcap Approves Bonding Process
M&I at Medical Trade Show
Problem Solving: Astro Style
Promotions / Hires
NHBB in Person

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Astro Earns Fourth Nadcap Accreditation



Split bushing with self-lubricating liner.

NHBB's Astro facility has earned Nadcap accreditation for its self-lubricating liner adhesive bonding process. Nadcap auditor, Performance Review Institute, awarded Astro a twelve-month Nadcap certificate under the commodities classification of Composites (AC7118), specifically the subsection titled Prepreg/Adhesive Bonding/Resin Film Infusion. Astro received the certificate on July 17, 2008.

NHBB is the first bearing company to earn Nadcap approval for its self-lubricating liner process.

(continued on page 2)

NHBB Publishes New Capabilities Brochure



Expanded facilities. New processes. New products. So much has changed since we last printed a capabilities brochure, it was high time we came out with a new one. Highlights include an expanded list of applications, updated lists of products and industry certifications, information about NHBB's corporate parent, Minebea Co., Ltd., a statement about NHBB's environmental standards, and a whole lot more. To request a copy of the new brochure, please send an e-mail to info@nhbb.com.

NHBB's Nadcap Approvals

Astro, Laconia, NH:

- AC7102- Heat Treating
- AC7108- Chemical Processing
- AC7114- NonDestructive Testing
- AC7118- Composites:
Self-lubricating liner adhesive bonding process (awarded in 2008)

HiTech, Peterborough, NH:

- AC7102- Heat Treating:
Including carburizing (awarded in 2007)
- AC7108- Chemical Processing
- AC7114- NonDestructive Testing

Precision, Chatsworth, CA:

- AC7102- Heat Treating

Accreditations appear in the online Qualified Manufacturers List (QML) on www.eauditnet.com.

NHBB Exhibits at MD&M East

2008 marked the fifth year that New Hampshire Ball Bearings has exhibited at the Medical Design and Manufacturing East trade show. The show took place June 3rd through 5th at the Javits Center in New York City. Out of the more than 4,400 exhibitors, NHBB was one of only two bearing manufacturers to participate (the other bearing manufacturer was NMBTC, a sister company to NHBB). NHBB promoted its full line of miniature and instrument bearings, emphasizing its technological advances for ultra-high-speed applications, including machined retainers, ceramic balls, high-performance steels, and NHBB's patented composite metal-polymer retainer.



Representing NHBB at the show were (from left to right) NHBB's Eastern Region Sales Manager Mary Beth MacKenzie, and Senior Sales Engineers Randy Brown and John Leger.



President Yamagishi presents Tim Dugan with the award for Sales Engineer of the Year.

NHBB Recognizes Five Employees

NHBB recently honored five employees for their outstanding service to customers. The employees were recognized at NHBB's annual sales meeting, which took place the week of June 9, 2007. Please join us in congratulating the following individuals for their exceptional efforts:

Sales Engineer of the Year

Tim Dugan
Eastern Region

Customer Service Rep. of the Year

Ken Petersen
Astro Division

Extra Mile Award

Debbie Rayno
Senior Administrative Assistant
Astro Division

Outstanding Achievement

Al Kerestes
Senior Sales Engineer
Western Region

Strategic Achievement

Cortland Strong
Senior Sales Engineer
Western Region

Astro Earns Fourth Nadcap Accreditation

(continued from page 1)

The Nadcap auditor spent three days working through a 64-page checklist and determined he needed to recommend only a few minor corrections. "That's an excellent result, especially for the first audit,"

said Astro's Senior Quality Engineer, Mike Fitzgerald.

According to Paul O'Brien, Astro's manager of applications engineering, the auditing process is arduous, time-consuming and expensive, but well worth the effort. "The majority of our customers currently do not require us to hold a Nadcap accreditation for our self-lubricating liner adhesive

bonding process," said Paul. "Nevertheless, we recognize the value of Nadcap approvals, as they instill in our customers the highest level of confidence in our procedures and controls."

Astro also holds Nadcap certifications for Chemical Processing (AC7108), Heat Treating (AC7102), and NonDestructive Testing (AC7114).

Astro's Engineers Design Cost-Effective Retrofit Solution

A customer recently approached Astro for help in solving a bearing wear problem in an existing application. A link assembly made by another bearing manufacturer was wearing out long before its rated life and well within the warranty period. With hundreds of engines in service, and each containing a set of six links, replacement costs were mounting. The customer was desperate to solve the problem quickly and economically.

The Background

The links fasten an auxiliary device to a larger assembly near the hot zone of a jet engine, holding the assembly firmly in place while bearing a vibratory load and only slight oscillatory motion. "Longer life was an important objective," said Brandyn Lewis, the applications engineer who worked on the project. "But the customer was also looking for a cost-effective retrofit solution."

The original product consisted of a solid welded link design with an integral bearing configuration in each end of the link. It was engineered to meet the tribological standards for an 800° F operating temperature. All of the components were manufactured from high temperature alloys and, due to the temperature limitation of self-lubricating liner systems, the bearing was specified as a metal-to-metal design.

The Challenge

During routine maintenance checks performed by end users, the bearings exhibited excessive wear of the ball and the raceway. The ball was rubbing through the raceway's hard coating and wearing away the rod end body from the inside. "This wear condition was happening so fast, the customer had to replace the links under warranty at least twice during the rated life of the parts," said Brandyn.

When Brandyn and Paul O'Brien, Astro's manager of applications engineering, reviewed the specifications, they concluded that the original design met all of the customer's requirements except for one. "According to our calculations, the existing bearing's geometry did not allow a large enough load bearing area," said Brandyn.

Although size was the major flaw in the original design, simply enlarging the existing bearing design was not a workable solution. This would have required the customer to redesign all twelve mounting brackets and retrofit them on every engine currently in service.

The customer stipulated that the new design had to fit within the existing brackets, which meant that all the rod ends had to meet the same exact envelope dimensions as before but with increased load capacity. This necessitated a move away from the existing design toward a "full wrap" spherical bearing.

The Solution

"Given the link's temperature specification, we felt that a high temperature self-lubricating liner system was the best solution because of its superior wear characteristics," said Brandyn. "In order to specify a liner system, though, the actual temperature near the assembly had to be below 625° F."

"A visual inspection of the actual engine showed several oil lines intersecting the area where the bearings were located," said Brandyn. "From this we surmised that the actual temperature had to be much lower than specified."



The approved turnbuckle design.

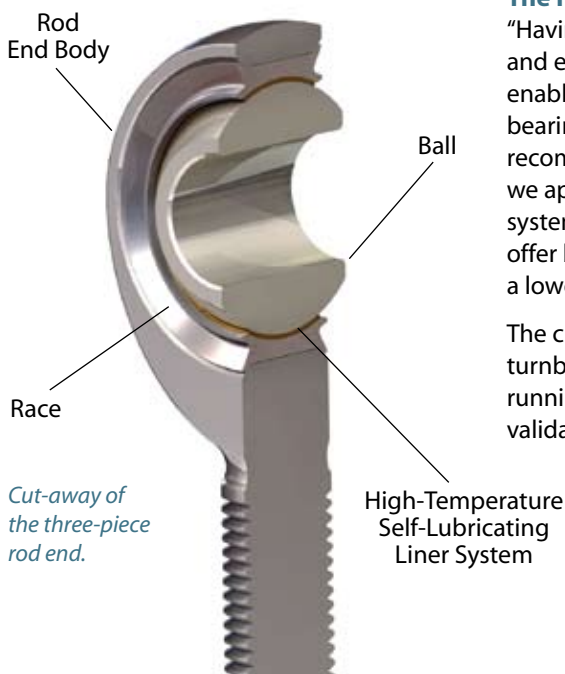
The customer agreed to verify Brandyn and Paul's hypothesis. Their engine test data confirmed that the actual temperature near the assembly was in fact low enough to allow the use of a liner system.

Astro's final design is a turnbuckle assembly consisting of three-piece rod ends with lined spherical bearings threaded onto a hollow tube and secured using keys and locking devices. This new design addresses the customer's need for an economical retrofit, it meets both the application's size and load requirements, and it is easy to install and maintain. The turnbuckle's length can be adjusted by twisting the hollow tube, and when the bearings finally wear out, only the rod ends themselves need to be replaced. This should happen less often because the liner system is expected to offer significantly improved life over the original design.

The Payoff

"Having such a broad product offering and extensive manufacturing capabilities enables us to evaluate several different bearing designs before making a final recommendation," said Paul. "In this case, we applied our knowledge of aircraft systems to identify a solution that should offer better performance, longer life and a lower retrofit cost."

The customer has approved the turnbuckle design and is currently running wear tests in their facility to validate performance. ●





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www.nhbb.com



Ken Petersen

Inside Sales Representative,
Astro Division,
Laconia, NH

Years at NHBB: four

NHBB In Person

In just four years with NHBB, Ken has built a reputation for providing excellent service with a smile and a laugh. Ken supports distributors and OEM customers located on the West Coast and in the Midwest. His responsibilities include handling inquiries, issuing quotations, processing purchase orders and monitoring orders from manufacture to delivery.

What Ken loves most about his job is his interactions with customers. "I have really great customers who are not just good at their jobs; they are good people, too," said Ken. "While being my slightly sarcastic self, I can count on them to give it right back to me. It makes the day so much more enjoyable."

He then added, "I'm lucky I don't have any Yankee fans to deal with; at least none that I know of. I couldn't take it!"

In recognition of his hard work and positive attitude, Ken was named Customer Service Representative of the Year in 2008. "I was shocked to hear that I had been chosen to receive this award," he said. "It's humbling to receive such a vote of confidence from the sales team. At the same time, it's very gratifying to be recognized for putting in all the hard work."

Congratulations, Ken.

Gary Groleau Earns Promotion

NHBB has promoted Astro's Human Resources Manager, Gary Groleau, to the position of Senior Divisional Manager. In his new and expanded role Gary will help NHBB's leadership facilitate organizational change and training and development efforts within all three divisions.

In addition, he will continue as Astro's Human Resources Manager, a position he has held for over 11 years.

"We are pleased that Gary has taken on an expanded role within the company. His newly created position amplifies our commitment to our most important asset, our employees," said Rich Bardellini, NHBB's vice president of manufacturing. "By fostering greater collaboration between the divisions and developing a uniform approach to employee training and development, we hope to give our



Gary Groleau



Rick Wilkins

employees the tools that enable them to succeed." ●

Materials Under New Management at HiTech

Meet HiTech's new Materials Manager, Rick Wilkins. Rick started in January, in response to the need for strengthening and broadening the capabilities of HiTech's Materials management team.

Rick is responsible for inventory planning, production control, purchasing, materials handling, shipping, receiving, and logistics. He oversees approximately 40 employees, whom he describes as exceptional. "I am lucky to have such a knowledgeable and experienced staff," he said. "They make my job as manager that much easier."

Rick's career in manufacturing spans twenty years. Prior to NHBB, Rick served as materials manager for GT Solar in Merrimack, NH, Key Polymer in Lawrence, MA, and A. W. Chesterton in Groveland, MA. He also served as the Manufacturing Manager for A. W. Chesterton, a position he held for four of his seventeen years with the company.

Rick holds a B.S. degree in Business Studies with a focus in Materials Management, and he has been certified by the American Production Inventory Control Society (APICS) for over fifteen years. ●