



New Hampshire Ball Bearings, Inc.
A Minebea Company

inside track

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Facility Enhancements Increase Precision's Manufacturing Capabilities

As part of a larger plan to provide more support to NHBB's aerospace customers, the Precision Division recently expanded its assembly area and installed equipment to assemble riveted ribbon retainers.

"Our vision is to further enhance our reputation as a key supplier of precision ball bearings within the aerospace market," said product sales manager Mary Beth MacKenzie. "We see an opportunity to satisfy the growing needs of commercial aerospace customers, particularly within the one- to three-inch O.D. range."

Since 2008, NHBB has added over \$12 million in capital equipment and improvements, increasing the Chatsworth facility's size capability up to nearly three inches. This expansion encompasses several product families, including airframe control bearings, metric series precision bearings, ultra thin section and torque tube ball bearings.

To accommodate both its current offering of precision miniature and instrument products as well as larger-diameter ball bearings, Precision expanded its existing Class 1000 clean room assembly area. The new assembly room, which became operational in September of 2012, is rated a Class 10,000 clean room and is dedicated solely to the assembly of airframe control bearings.

This year, Precision also began the assembly of riveted ribbon retainers. A riveted cage is stronger than a clinched ribbon retainer and, therefore, enables a bearing in the range of one to three in. O.D. to operate at moderate to high speeds. Ball bearings with riveted cages are used in various aerospace applications, such as airframe control systems, auxiliary power units (APUs), air/fuel valves, and aircraft instruments.

Precision also acquired and installed several new pieces of equipment, including a heat treat furnace with a larger chamber and the capability to process BG42[®] alloy, a tempering furnace for heat stabilization up to 850°F, and NDT equipment for conducting magnetic particle inspections and surface temper etch tests. The division is also pursuing Nadcap accreditation of its passivation process.

BG42[®] is a registered trademark of Latrobe Specialty Steel Company.

continues on page 2



Precision's assembly room was expanded this year to make room for larger ball bearings.

Inside this issue:

- Message from the President
- NHBB Supplier Summit
- Introduction to Oscimax[®]
- A brand is born: INVINSYS[®]
- myonic earns award
- NHBB in Person
- New materials manager

Aerospace Customer Names the Precision Division a Preferred Supplier

Lockheed Martin Missiles and Fire Control (MFC) recently honored our Precision Division with two awards, which were announced and presented at the MFC Preferred Supplier Tradeshow held in November. The first award was for 100% on time and 100% quality acceptance for the previous 12 months; the second was in recognition of Precision's status as an MFC Preferred Supplier. Lockheed Martin Missiles and Fire Control develops, manufactures, and supports advanced combat, missile, rocket and ground combat systems for the U.S. Army, Navy, Air Force, and Marine Corps, as well as multiple foreign military customers. Our Precision Division manufactures ultra-precision specialty ball bearings, thin section duplex bearings, and complex bearing solutions for MFC and many other leading global aerospace and security companies.



Accepting the Lockheed Martin Missiles and Fire Control awards on behalf of the Precision Division are Alex Garcia (left), manager of applications engineering, and Ken Petersen (right), NHBB's field sales engineer for the southeastern United States.



Gary Yomantas

A Message from NHBB's President

Supplier performance in the global aerospace market has reached a point where perfect quality, 100% on-time, and nothing less than excellent customer service are merely prerequisites to earning more business. Suppliers that continually fall short of these benchmarks inevitably face diminishing opportunities. The good news is that many of our customers are taking an active role in building successful supplier partnerships based on collaboration, continuous improvement, transparency, and trust. They are doing so because they recognize, like we do, that a healthy supply base is essential to their success.

At NHBB, we understand that having a highly capable and adaptable supply base is vital to achieving the quality, delivery, cost containment, and service our customers demand. That's why we strive to build and sustain a world-class integrated supply chain (and why we encourage our suppliers to improve the performance of their own suppliers, as well). To that end, we are standardizing supplier performance metrics, facilitating the adoption of best practices, conducting regular supplier performance reviews, assisting suppliers with improvement initiatives, and streamlining information access and sharing between ourselves and our suppliers.

Because our customers' success also depends on the quality of our suppliers, it's imperative that we build lasting relationships with the best companies in the industry. So, we are raising the bar for our supplier performance standards. At a minimum, our suppliers need to achieve near-perfect on-time delivery, perfect quality, and offer competitive pricing. In addition, they must score high marks for customer service, continuous improvement, and product innovation, and exhibit such characteristics as dependability, flexibility, and trustworthiness.

Reflected in these initiatives is the active role we are assuming within our own supply base. We've empowered ourselves to build sustainable partnerships with key suppliers so that we may become the strongest link in our customers' supply chains.

Facility Enhancements Increase Precision's Manufacturing Capabilities

continued from page 1

"The Precision Division has built a solid reputation for product quality, customer service, competitive pricing, and on-time delivery," said Mary Beth. "Increasing our size capacity and specialized manufacturing techniques to accommodate further design complexity will strengthen our ability to meet the growing needs of NHBB's commercial aerospace customers."

In the past few years, the Precision Division has expanded its size capability up to nearly three inches.



NHBB's Annual Supplier Summit Draws Large Gathering of Key Suppliers

There was great interest in NHBB's ninth annual Supplier Summit as more than 130 individuals from 73 different service, manufacturing, and distribution companies attended the event.

The Summit's theme was "Getting to Gold". Attendees were introduced to our Supplier Gold program and received details about our plan for building a world-class integrated supply chain, which includes standardizing supplier performance metrics, conducting quarterly supplier performance reviews, and assisting suppliers with Kaizen continuous improvement initiatives.

We also announced plans to hire a corporate-level senior quality engineer, who will standardize best practices throughout NHBB and coordinate quality assessment activities on behalf of all three NHBB divisions. An executive search is underway and we're looking to fill the position in the first quarter of 2013.

The Summit ended with a note of encouragement from Barry Wilk, our director of materials. "NHBB's ability to meet our customers' needs is dependent on the performance of our suppliers," he said. "The Supplier Gold program asks you to execute at a higher level, but the rewards for doing so — business stability, competitive advantage, and increased revenue — will prove to be worth it."



NHBB's President Gary Yomantas addresses the audience at the ninth annual Supplier Summit.



Q&A WITH DICK RAY

Introducing Oscimax® Self-lubricating Liner Technology

Dick Ray is NHBB's director of applications engineering and new product development. He oversees the activities of the New Product Development Center (NPDC), the division responsible for developing Oscimax®. Here, he answers some commonly asked questions about this latest innovation.

What is Oscimax®?

Oscimax® is a uniquely advanced self-lubricating liner technology that consists of a proprietary matrix of thermosetting polymeric resins, PTFE, and various other scientifically developed compounds. The technology is applied as a homogeneous layer that is machinable from surface to substrate.

Where is Oscimax® used? Can it be used as a fretting barrier?

The patent-pending technology is used primarily as a self-lubricating liner in a wide range of bearing assemblies found in airframe and engine subsystems, including engine controls, thrust reversers, wing surface controls, VGV systems, and flight control systems. Due to its superior wear resistance and adaptability, Oscimax can also be used as a fretting barrier in many of these same applications.

To what surfaces can Oscimax® be applied? Is the liner fully machinable?

Oscimax® can be applied to virtually any surface, including bore, O.D., flange, chamfer, and flat surface. Once applied, it produces a consistent, secure bond to most metallic substrates while promoting higher dynamic loads and significantly reduced wear rates. Oscimax® is fully machinable using conventional manufacturing techniques, enabling customers to achieve exact tolerances, better fits, and superior performance of the bearing assembly.

What is the rated life of Oscimax®? How does it compare to other machinable liner solutions?

It is difficult to delineate the operating life expectancy of bearings and related mechanical assemblies containing Oscimax® without first evaluating the specific performance requirements of an actual application. Having said that, test results repeatedly demonstrate that Oscimax® represents a breakthrough in wear resistance and operating life for aircraft bearings and assemblies. Independent lab testing has confirmed that Oscimax® exceeds all performance requirements of AS81934 beyond 100,000 cycles, and tests conducted by the NPDC have resulted in liner wear-rates under .004 inches at approximately one million cycles.*

How does Oscimax® react when exposed to contaminants?

Oscimax® is an excellent choice for harsh environments containing moisture and corrosive oils and chemicals. Unlike fabric-based liners, Oscimax® is not susceptible to moisture gain, offers superior corrosion resistance for liner substrates, and performs more consistently through temperature changes.

Does NHBB plan to introduce different versions of Oscimax®, including an injection-molded liner for spherical bearings?

Yes. Oscimax® will evolve to include alternative formulations that offer specific performance characteristics, such as low friction or high temperature. As for spherical bearings lined with Oscimax®, our goal is to develop and introduce an injection molded self-lubricating liner (IML) solution by late 2013. Customers interested in specifying Oscimax® on their next project should contact the Astro Division's product engineering group.

**The version of Oscimax® qualified to AS81934 is identified with the extension "XT."*

oscimax®



A brand is born: The INVINSYS® Bearing System

Product code L2010 has been replaced by the brand name INVINSYS® as the official term for our innovative pitch link control bearing system. The name INVINSYS® signifies the technology's exceptionally long life and durability. Consisting of an enhanced self-lubricating liner paired with a specially coated ball, the INVINSYS® bearing system is engineered for superior wear resistance (liner wear of .003 in. or less over 1,500 hours) as well as extremely high resistance to moisture absorption and chemical attack.

The patent-pending solution is also resistant to the high-alkaline compounds found in most cleaning solutions, which are proven to shorten bearing life. The significant performance advantage provided by the INVINSYS® bearing system helps reduce maintenance and repair costs of helicopter pitch control systems. Because no other pitch link control bearing system delivers the same level of performance, we chose a brand name that is equally unique and powerful – INVINSYS®.

Contact the Astro Division for more information about our INVINSYS® bearing system for rotary wing pitch control applications.





Katie Ames
 Inside Sales Supervisor – Astro Division
 Laconia, NH • Years at NHBB: 22

NHBB in Person

What I enjoy most about my job is solving customers' problems. A typical issue I face nearly every day involves requests for early delivery. I enjoy doing the research and identifying ways to satisfy the customer.

Teamwork is another aspect of problem solving I enjoy. I am a big proponent of the need to build relationships with the various departments we work with on the inside. Within my team, I stress the importance of being a positive and approachable team player — it's an approach that ultimately benefits the customer.

My primary job responsibilities are to service my own customers through quotations, order administration, and delivery status updates. I also manage the workload of Astro's inside sales team to ensure all of our customers are being serviced appropriately.

I have been the supervisor of the inside sales department for 12 years. I have also served as an inside sales rep, buyer, and administrative assistant.

For comments or questions about *Inside Track* contact:

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myonic Earns Civic Award for Innovation

myonic was awarded a prize for innovation by the Society for the Promotion of Economic Development representing the German district of Ravensburg. Awards are given to companies that strengthen the economic health of the region through their inventions. One of 24 companies in the district to participate in the contest, myonic earned the prize for its Intellispin® dental chuck. This innovative new spindle design strengthens the clamping force of the dental handpiece chuck, which increases patient safety and improves drill bit installation and removal. The design could also lead to long-term benefits for the dental industry by enabling handpiece OEMs to reduce the size of dental drills. myonic is a part of the Minebea Group of Companies and is a close business partner of NHBB. Well known for its design/development capabilities and precision manufacturing, myonic is represented in the U.S. by myonic USA, a division of NHBB.

Astro Hires New Materials Manager

Jim Scanlon has rejoined NHBB as the materials manager of the Astro Division. He succeeds Barry Wilk, who is now our director of materials. Jim is knowledgeable and experienced in the disciplines of materials and production control, and he is well-versed in our existing systems, having worked for the HiTech Division for 17 years. Just prior to joining Astro's management team, Jim worked for UTC Aerospace, where he was responsible for supply chain operations and a component production line. Before that, he served as materials and supply chain manager for Letourneau Technologies. Jim holds a BA in business administration from Northeastern University. His first day was September 17, 2012.



A LEAP Forward for Employee Development

HiTech has instituted a leadership program designed to help employees reach their maximum potential. The Leadership Excellence Advancement Program (LEAP) is a one-year educational opportunity open to 15 employees interested in developing their leadership skills. The division announced the new program in the fall and over 30 people applied. Classes are scheduled to begin this month (Jan '13) and will occur monthly throughout the year.

NHBB's Tradeshow Calendar

Visit us at one of the following 2013 shows!

<p>MD&M West February 12-14, 2013 Anaheim Convention Center Anaheim, CA Booth #3344 MDMwest.com</p>	<p>Heli-Expo March 5-7, 2013 Las Vegas Convention Center Las Vegas, NV Booth #N3304 rotor.com</p>	<p>MD&M East June 18-20, 2013 Pennsylvania Convention Center Philadelphia, PA Booth #3645 MDMeast.com</p>
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