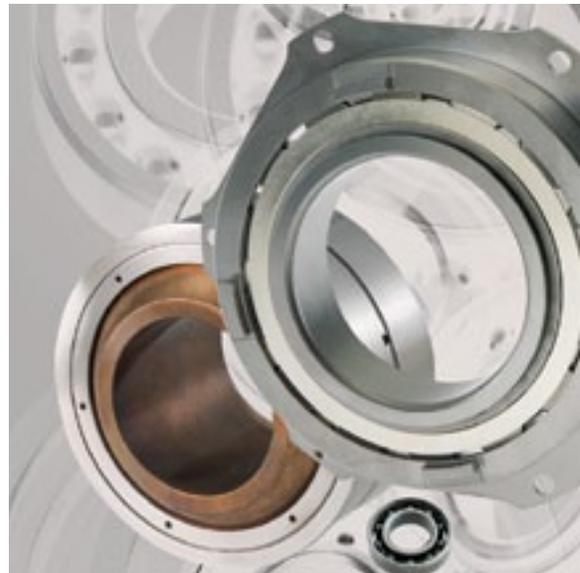


**NHBB CAPABILITIES**







New Hampshire Ball Bearings, Inc.

— *A Minebea Company* —

At New Hampshire Ball Bearings, we serve as a valued supplier and technical resource to our customers in the aerospace, defense, medical/dental, and high technology industries. We've been at the forefront of precision bearing manufacturing since 1946, thanks to our commitment to customized solutions and our continuous investment in technology.

With corporate headquarters in Chatsworth, California, and three technologically advanced precision manufacturing facilities in the United States, NHBB is uniquely positioned to meet today's competitive marketplace demands.

Our highly skilled sales and engineering professionals, supported by dedicated inside sales and service teams, provide sound technical advice through all phases of product development and post-sales support. Answering your design- and performance-related challenges continues to be our market advantage.

As part of Minebea Co., Ltd., a \$3 billion worldwide manufacturer, we are committed to competitive innovation, leading-edge R&D, and technologically advanced manufacturing.

## UNIQUE CHALLENGES: ORIGINAL APPROACHES

For more than 60 years, we have been a trusted engineering resource to our customers — whether we're offering a solution from our wide range of standard bearing products or creating an entirely customized bearing assembly.

Our applications engineers have broad knowledge, deep experience, and a keen interest in emerging technology and industry trends. No one is better prepared to recommend the right solution for your motion control needs. Beyond the basics of loads, speeds, temperature and corrosion, we examine manufacturability, installation, and cost to provide a total bearing solution. In addition, our up-to-date analytical and diagnostic technology and uniquely capable *New Product Development Center* enable us to deliver complete bearing engineering support for every phase of a product's life cycle.

To deliver maximum value, we remain deeply involved in all stages of a product's development — from inception through postproduction. This concurrent engineering process allows us to work closely with you, making decisions that enhance the performance and life of the entire assembly. That's the true benefit of a solid partnership.



## NHBB REAL-WORLD APPLICATIONS

### COMMERCIAL AND MILITARY AEROSPACE

Helicopter Rotor Assemblies  
Airframe Control Systems  
Landing Gear  
Engine Mounts  
Gearboxes  
Auxiliary Power Units  
Fuel/Air Valves  
Aircraft Instruments  
Navigation Systems  
Engine Mainshafts

### HIGH TECH AND HIGH PERFORMANCE

Scanners  
Semiconductor Processing  
Robotics  
Galvos  
Microturbines  
Turbomolecular Pumps  
Flow Meters  
Optical Encoders

### MEDICAL AND DENTAL

Handpieces and Drills  
Centrifuges  
Diagnostic Equipment  
Surgical Instruments  
Cardiovascular Devices  
Artificial Heart Pumps  
Blood Analyzers  
Cryogenic Pumps  
Lasers

### DEFENSE

Missiles  
Tanks  
UAVs



## MANUFACTURING EXCELLENCE

What does it really mean? It means we believe in improving on everything to deliver the highest quality products and most dependable service.

Our customers trust us to achieve the close tolerances required in life-critical and high-speed applications. That's why we look beyond today to capitalize on the innovations of tomorrow. By investing in the most advanced technologies available, we ensure that our precision manufacturing capabilities keep pace with customer needs.

And it's not just about the machines. Thanks to our highly skilled engineers and technicians, we address manufacturing challenges in-house, often by creating new machine tools, precision gauges, and production processes that best suit the need. We employ lean manufacturing and continuous improvement programs to facilitate efficient throughput, product conformity and cost containment. We also leverage the collective intelligence of the entire company to establish best practices within each division, department and cell.



## HIGHLIGHTS

Expanded product development and testing capabilities

– New Product Development Center

State-of-the-art precision manufacturing facilities

Certified clean rooms for assembly

Fully equipped metallurgy labs and heat treat facilities

Highly automated multi-axis precision machines

Computerized manufacturing – CNC, CAM

Statistical process control (SPC)

Custom-made manufacturing technology

In-process high-precision gauges

Lean manufacturing and continuous improvement programs

Total quality control of all manufacturing processes

## CERTIFICATIONS:

- ISO 9001:2008
- ISO 14001:2004
- AS9100, Rev. C
- Boeing D6-82479
- Nadcap



# ASTRO DIVISION

LACONIA, NEW HAMPSHIRE

## Confident Customization. Continuous Improvement.

NHBB's Astro Division builds partnership value by offering a breadth of capabilities and a diverse product mix. Our continuous improvement culture exemplifies our prevailing commitment to customer satisfaction.

It begins with significant engineering expertise that includes custom bearing design, the utilization of specialty materials, as well as the fabrication of next-up assemblies and machined parts. On the factory floor, stringent process control methods are used to satisfy the individualized production requirements of each project. Follow this with an advanced planning system for improved delivery scheduling, and considerable after-market follow-up, and you'll see how improvement takes on a whole new meaning.

\*Astro is the North American sales representative for products manufactured by NMB's facility in Karuizawa, Japan, giving customers access to a global supply of high-quality commercial aerospace parts.

### ASTRO DIVISION PRODUCTS:

- Rod ends
- Sphericals
- Link assemblies
- Bushings
- Loader slot bearings
- Custom-lined parts
- Bearings up to 22 in. O.D.
- Next-up assemblies and machined parts

### NMB, KARUIZAWA, JAPAN:\*

- Rod ends
- Sphericals
- Spherical roller bearings
- Self-aligning roller bearings
- Next-up assemblies & machined parts



CERTIFICATIONS/APPROVALS: ISO 9001:2008 • ISO 14001:2004 • AS9100, Rev C • Boeing D6-82479 • FAA FAR 21.303  
Nadcap: AC7102 Heat Treating • AC7108 Chemical Processing • AC7114 Nondestructive Testing • AC7118 Composites/Bonding



*NHBB has strengthened its commitment to product development and testing by transforming Astro's R&D/test lab into NHBB's New Product Development Center. The center is responsible for spearheading product innovation throughout NHBB as well as offering performance validation testing in support of customers' product life requirements.*



# HITECH DIVISION

PETERBOROUGH, NEW HAMPSHIRE

## Advanced Capabilities. Amazing Adaptability.

At NHBB's HiTech Division, we pride ourselves on responsiveness, dedicated customer service, and knowledgeable engineering support. But we take it a step further. Our commitment extends past current competencies to include adding new capabilities necessary to support our customers as their businesses diversify.

Our applications engineers serve as valued technical specialists to the aircraft market by developing large, complex bearing assemblies to exacting specifications. Combine this with a site that houses the most advanced technology necessary to meet the varied production requirements of these highly customized products. Now add an adaptable team that makes it possible to move small lots of complex bearings through our state-of-the-art facility and you'll understand why we're strategic partners with leading companies in the aerospace industry.

### HITECH DIVISION PRODUCTS:

- Customized complex bearing assemblies
- Cylindrical roller bearings
- Ball bearings
  - Angular contact
  - Gothic arch
  - Duplex and super duplex
  - Torque tube
  - Thin section
- Special materials, including
  - BG42®
  - Cobalt-based alloys
  - M50NiL
  - Nitrogen-enriched steel
- Bearing sizes through 300 mm O.D.





*HiTech's engineering and manufacturing teams utilize state-of-the-art technology to perform metallurgical, visual and dimensional analyses to validate design innovations and evaluate bearing performance.*



# PRECISION DIVISION

CHATSWORTH, CALIFORNIA

## Keeping Technology on the Move®

The Precision Division is the leader in applying volume production methods to non-standard, ultra-precision miniature and instrument bearings. Our long-standing commitment to product testing and development has strengthened our ability to offer unique solutions, especially in high-speed and low-torque applications.

Customer relationships define our primary focus. We recognize the need for cost-effective solutions without sacrificing performance, and work closely together to find the best outcome for our customers. Then, with a proactive approach to order scheduling, production plans and lead times, we ensure that expectations are met. In fact, our customers discover we're very much in sync with them – and still thinking.

\*The Chatsworth facility is also home to myonic USA, the North American sales division of myonic GmbH, a Minebea subsidiary and close business partner of NHBB. Please visit [myonicusa.com](http://myonicusa.com) for more information.

### PRECISION DIVISION PRODUCTS:

- Precision miniature and instrument bearings
  - Hybrid ceramic
  - Torque tube and thin section
  - Duplex and super duplex
  - Machined cages – Delrin®, Phenolic, Torlon®, Meldin®
- Middle size bearings up to 2.5 in. O.D.
- Airframe control bearings
- Next-level assemblies

### MYONIC GMBH, GERMANY:\*

- Precision miniature ball bearings
- Thrust bearings
- X-ray tube bearings
- Dental bearings, spindles, complete turbine assemblies
- Customized bearing systems





*NHBB's ongoing research on new retainer materials and lubricants yields bearings that last longer, perform more consistently, and run quieter. It has also led to industry firsts, such as our patented silver-polymer retainer, which extends bearing life by up to 60%.*



Torlon® is a registered trademark of Solvay Advanced Polymers, L.L.C.  
Meldin® is a registered trademark of Saint-Gobain.  
Delrin® is a registered trademark of E.I. Du Pont de Nemours and Company.

## COMMITMENT TO THE ENVIRONMENT

At NHBB, environmental protection is a key management objective. Our stringent environmental policy emphasizes pollution prevention, regulatory compliance, and continuous improvement aimed at reducing the impact of every phase of the manufacturing process. Our objectives also include the promotion of environmental awareness among employees and within our communities. NHBB's efforts are recognized by certification to the ISO 14001 standard for environmental management systems and through the publication of environmental, social and economic sustainability reports.

## MINEBEA CO., LTD.

### INNOVATION: THE KEY TO SUSTAINABLE GROWTH

New Hampshire Ball Bearings is an integral part of an international business. Its parent company, Minebea Co., Ltd., is the world's leading specialized manufacturer of miniature ball bearings and high precision components for the telecommunications, aerospace, automotive and electrical appliance industries.

The Minebea Group is comprised of 43 subsidiaries in 17 countries, and employs more than 50,000 people. In addition to its worldwide manufacturing capabilities, Minebea's vision is to lead the competition through manufacturing and technological excellence.



**Minebea**  
Passion to Exceed Precision





New Hampshire Ball Bearings, Inc.

— *A Minebea Company* —

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