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Customer-Facing Engineering Department Under New Leadership



Natasa Savic-Remella, Engineering Manager, Applications/Design Department, NHBB HiTech Division.

NHBB HiTech Division has selected an experienced engineer who has an excellent reputation with customers to lead the Applications/Design department. Natasa Savic-Remella stepped into her new role as Engineering Manager in October of 2020. She is responsible for managing a staff of customer-facing applications engineers, design engineers, and design support technicians.

Natasa has worked for the NHBB HiTech Division for over 18 years as an engineer in both the Quality and Applications/Design departments. She joined NHBB as a Quality Assurance Engineer in 2002, and, after five years, she transitioned into the Applications/Design department where she most recently served as a Senior Product/Applications Engineer. She spent the next 13 years working closely with customers to assist them with bearing selection and design for critical aerospace applications.



Photo Credit: digitalHUB Aachen e.V., AGIT GmbH

The digital-Pioneer 2020 Award was presented to CEROBEAR GmbH executives Kurt Peters, Head of IT Department, (center-left) and Dr. Fabian Bachmann, Managing Director (center-right).

Digital Transformation

A recognized "digital pioneer" is assisting other MinebeaMitsumi Aerospace companies with developing strategies for adopting Smart Factory solutions.

Not only is CEROBEAR GmbH a leading innovator of hybrid ceramic bearing solutions, the German manufacturer is also a pioneer in digital factory technologies. Last year, the company was honored with the digital-Pioneer 2020 award by digital-HUB Aachen, a local business association that recognizes local companies for successfully developing outstanding Industry 4.0/Smart Factory solutions.

CEROBEAR was chosen from a group of approximately 30 companies that elected to participate in the business competition. Finalists presented their concepts before a jury of local politicians, research scientists, and business leaders. CEROBEAR was the only award winner that presented a digital solution for a manufacturing facility.

"With our Industry 4.0/Smart Factory roadmap, our objective is to digitize and automate nearly all of our production and business processes," says Dr. Fabian Bachmann, Managing Director of CEROBEAR. "It's a long-term initiative that will further develop as the technologies mature and as more innovations reach the market."

Smart Factories are cyber-physical production systems (CPPS) with highly automated machines, sensors, and actuators, which are interconnected through the Internet of Things (IoT). The CPPS leverages big data and AI solutions embedded in Enterprise Resource Planning (ERP) software to create a highly stable production environment through real-time data collection, analysis, and

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A Message from Leadership

Building Resiliency: The Silver Lining to Difficult Times

Dan Lemieux, Head of Aerospace & Machined Products Division – MinebeaMitsumi Inc.
MinebeaMitsumi Aerospace



At the 2017 Paris Air Show, we unveiled the *MinebeaMitsumi Aerospace* brand as a unifying mark of a distinct group of MinebeaMitsumi manufacturing divisions. We believed that we could better serve our customers' needs by working closely together as a cohesive unit. We are guided by the vision statement *bringing excellence together* because we also share a passion for achieving excellence. Today, despite the weak and turbulent business conditions caused by the pandemic, we are in a much stronger position as a group to weather the storm as we continue to set our course for the future.

An essential component of our brand's identity is customer-focused new product development. We can provide even more outstanding support by working directly with customers and each other. Recent collaborations on new products for aero-engine main shafts, helicopter rotor systems, landing gear, and airframe control applications have resulted in unique technical solutions for our customers' most demanding challenges. NHBB's New Product Development Center, a central piece to most collaborative efforts, continues to expand its capabilities in step with customer demand (see the article on page five).

The question that drives our decision-making in good times and in bad is, how can we produce complex products at a faster pace with even greater precision while maintaining our highest quality standards? We continue to find the answers in such concepts as Smart Manufacturing, Industry 4.0, and Digital Transformation and have accelerated our investments in these technologies during this economic downturn caused by the

global pandemic. CEROBEAR, one of our most advanced manufacturers, is leading the Aerospace group's plan and implementing technology roadmaps suited to each manufacturing division's specific needs. We expect rapid adoption of these technologies in the short term, in time to capitalize on post-pandemic growth.

Perhaps the most important reminder to come out of this pandemic is how committed our employees are to each other and our valued customers. From the beginning, our employees have responded with concern and care to the protocols we established to keep our factories virus-free while maintaining a maximum level of production output. They have continued to achieve high standards while taking the extra precautions needed to keep everyone safe. Our employees have also embraced community activities, such as volunteering, donating blood, and fundraising for school supplies – I am proud of their dedication and generosity.

Resilient companies strike a balance between growth and consequential economic, social, and environmental impacts. MinebeaMitsumi, as a whole, acknowledges the role of human activity in climate change, which has led to a constant investment in sustainable practices. The group is reducing its carbon footprint by investing in on-site solar power generating plants at its facilities worldwide. In the United States, we plan to install a 1.4 MW-DC photovoltaic (PV) power facility at our campus in Chatsworth, California. This renewable power source will provide a majority of the campus's electricity beginning this summer.

NHBB is celebrating a rare and remarkable achievement in 2021 by reaching its 75th year in business. MinebeaMitsumi has played an integral part in NHBB's continued existence for 36 years by helping NHBB invest in new capabilities, new technologies, and new product development. All of the *MinebeaMitsumi Aerospace* manufacturing divisions receive this same level of support. While these investments are essential, we also believe that how we become our customers' most valuable supplier for the next 75 years is by *bringing excellence together*.

Stay safe and may you have a prosperous 2021.

C&A Tool to Produce Face Masks for the U.S. Market

To help ward off a shortage of face masks this winter, as a third wave of COVID-19 cases surge during the onset of flu season, C&A Tool has repurposed a section of its factory footprint to produce disposable face masks for the U.S. market.

The Indiana-based contract manufacturer, with the support of MinebeaMitsumi, plans to make surgical-style face coverings for people to use in non-medical settings, such as workplaces, retail shops, grocery stores, and homes. Production began in December for shipment to online retailers by the beginning of February.

During the first few months of the COVID-19 pandemic, face masks were in short supply worldwide. To fill the gap, MinebeaMitsumi established mask production lines in its factories in Asia. The company provided these much-needed face masks to all of its employees worldwide. It then asked each division to donate their surplus N95 face masks to medical facilities and first responders in their respective communities.

"As cases began to surge in the U.S., MinebeaMitsumi acted quickly to approve our plan to produce face masks at C&A," said Dan Lemieux, Head of the MinebeaMitsumi Group division that oversees C&A Tool. "It then mobilized the resources necessary to assist us in manufacturing these critical protective supplies in America. I am proud to be a part of such a thoughtful and proactive company, and we are so grateful for their support."

For more information, visit catool.com.





Mach Aero's manufacturing campus in Bangalore, India

India Offset Requirements a Value-Add

Mach Aero to manufacture complex machined parts for a European customer at its Bangalore facility.

Operating a factory in India with advanced manufacturing capabilities is enabling Mach Aero to provide additional value by supporting its customers' efforts to gain greater access to one of the largest and fastest growing aerospace markets in the world today.

One of Mach Aero's aerospace customers recently awarded the French outfit a contract to manufacture complex, machined aero-engine components. Each component is a critical piece of a complex assembly located within the hot section. The parts will be made of an exotic alloy whose improved high-temperature resistance and corrosion resistance provides superb durability and reliability. Their production specifications call for high-precision

tolerances and advanced production techniques.

During the product development and prototyping phase, Mach Aero demonstrated that it could easily manage the project's advanced manufacturing capabilities at its India facility. This outcome provided the added benefit of enabling their customer to satisfy the terms of India's offset policy, which stipulates that OEMs must source domestically a certain percentage of the components on aircraft sold in India.

The plan is for Mach Aero to receive rough forgings from a customer-qualified third party. It will then execute a full sequence of high-precision secondary operations. Five-axis grinding, brazing of a complex-patterned surface, and

tac welding are some of the customer-approved processes involved. After Mach Aero inspects each part per a Nadcap-certified special process, the finished components will be shipped to the customer in complete sets, ready for assembly and installation.

Established in 2007, Mach Aero's manufacturing campus in Bangalore encompasses three buildings, over 80,000 sq. ft. of manufacturing space, and approximately 200 workers. The site holds an EN 9100 certification and a Nadcap accreditation for Nondestructive Testing (NDT). Engineering, high-precision machining, assembly, surface treatment, and inspection are some of the production activities that take place there.

Digital Transformation continued from page 1

feedback. Some of the key benefits of this highly controlled and automated system include consistently high product quality, higher yields, faster throughput, and flexible production schedules.

Although the digital-Pioneer 2020

award is a local honor, it has global implications for CEROBEAR and its parent company. Within the MinebeaMitsumi Aerospace Group, CEROBEAR is the driving force for adopting an Industry 4.0/Smart Factory production model and

technologies. Having drafted its five-year plan several years ago, the German manufacturer is now using its experiences and expertise to assist other businesses in the Group to develop their own Industry 4.0/Smart Factory roadmaps.



We support leading A&D manufacturers with state-of-the-art bearing development and qualification testing.

MinebeaMitsumi Aerospace companies partner with leading aerospace and defense manufacturers to engage in new product development and qualification testing of advanced bearing solutions for diverse applications. Supported by a culture that values customer-focused innovation, this value-added service enables us to develop – and ultimately verify – proven solutions to your demanding bearing system requirements.

Engines
Gearboxes &
Transmissions

Auxiliary
Mechanical
Systems

Airframe
Flight Control
& Fuselage

Landing Gear-
Main & Nose

Rotorcraft &
VTOL

Space &
Satellite

Weapon
Systems

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MinebeaMitsumi
AEROSPACE

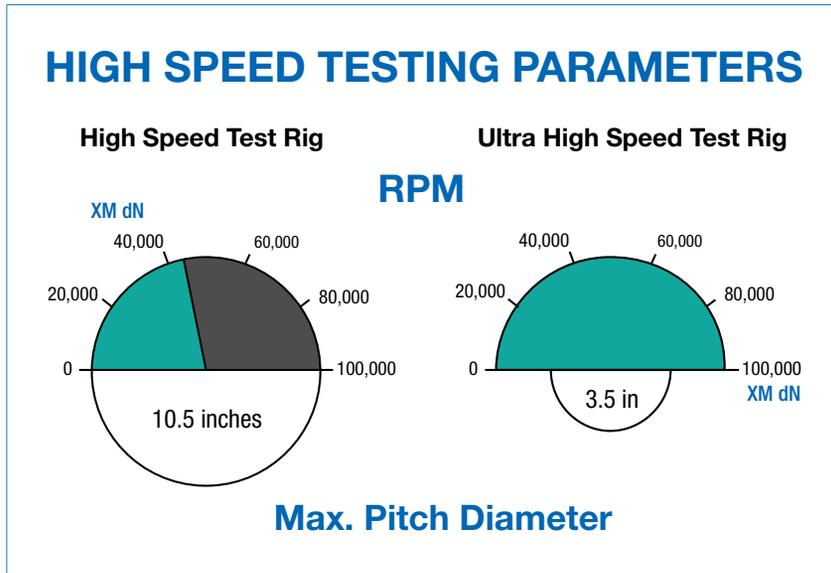
High Speed Testing Capabilities

MinebeaMitsumi Aerospace is expanding its rolling element testing capabilities to meet the needs of aerospace customers.

Customer needs are the driving force behind investments in the new product development and testing capabilities of MinebeaMitsumi Aerospace companies. In response to numerous customer requests, one of the Group's hubs of innovation, the New Product Development Center (NPDC), is increasing its ball bearing testing capabilities to cover extremely high rotational speeds by investing in a new air turbine motor.

This powerful new drive system can generate shaft speeds up to 100,000 rpm within the context of the current test rig setup and as high as 150,000 rpm with the addition of an oil mist lubrication system. Such high speeds will enable the NPDC to conduct tests on bearing assemblies used in air turbine starters, missiles, fan motors, turbochargers, and many other high-speed and low-torque applications.

The NPDC is currently working on integrating the air turbine motor into one of its existing rolling element test rigs in preparation for the first series of high-speed tests scheduled for early January 2021. The motor will work with both the radial endurance test rig, which can run bearings



The NPDC's test capabilities reach as high as 4 million dN.

up to 7.9 inches OD, and the axial endurance test rig, which can test bearings up to 5.1 inches OD.

With these maximum dimensions, the NPDC is capable of conducting tests for nearly all high-speed applications. The NPDC will consider the full operational conditions of a given application, addressing such factors as speed, load, material properties, lubrication condition, and more, to develop suitable high-speed test

protocols on behalf of the customer.

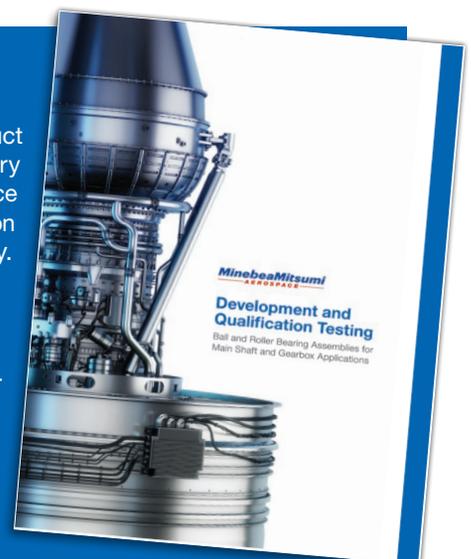
"Our investment in the air turbine motor is characteristic of the targeted approach we take toward building our new product development and testing capabilities," says Brandyn Lewis, Engineering Manager, New Product Development. "By responding to real-world application challenges, we're better able to align our capabilities with the needs of our customers."

Aero Engine Testing Brochure Published

MinebeaMitsumi Aerospace has released a new brochure summarizing the new product development and testing services available to global aero engine customers. Its primary focus is on rolling element bearings for main shaft and gearbox applications. The piece provides an overview of the testing capabilities — from elemental to full scale — and data on the potential test rig setups. Visit minebeamitsumi-aerospace.com to download a copy.

NHBB Website Made Over

NHBB relaunched its website last summer to provide visitors with an improved user experience on desktops, tablets, and mobile phones. The site features a responsive design, an updated information architecture, and more in-depth content. To see the improvements for yourself, visit nhbb.com.





New Hampshire Ball Bearings, Inc.
MinebeaMitsumi Group

NHBB Division Achieves a Safety “Hat Trick”

The Astro Division in Laconia, NH, knows a thing or two about safety. For the third time since 2008, the Astro Division surpassed one million hours worked without incurring any lost time due to injury. For the second time, the Division went 12 consecutive months without any lost-time injuries or illnesses. These achievements (recorded between June 2019 and June 2020) earned Astro the Million Hours Worked Award and the Perfect Attendance Award from the National Safety Council (NSC).

“Safety is more than a high priority at the Astro Division. It’s the primary pillar in our value system,” says Rich Bardellini, Executive Vice President of NHBB and General Manager of the Astro Division. “Our value system is passionately driven and supported by top management and front-line employees, and our commitment to safety is demonstrated through an empowered Joint Loss Safety Committee. I am very proud of and not at all surprised by Astro’s safety achievement ‘hat trick,’ given the committee’s long-established history of excellence.”

According to Mike Hamilton, Astro’s EHS coordinator, the division’s outstanding safety record stems from effective leadership, a robust safety program, and every employee’s commitment to creating a safe work environment. “A safe workplace is the result of everyone consistently doing the right things to prevent injuries and illnesses,” says Mike. “NHBB’s commitment to safety is very evident here. During my career as a safety officer, I have worked at four different companies, and I can tell you that NHBB’s safety program and emergency preparedness response protocols are the best I’ve seen.”

NHBB Celebrates a Major Milestone

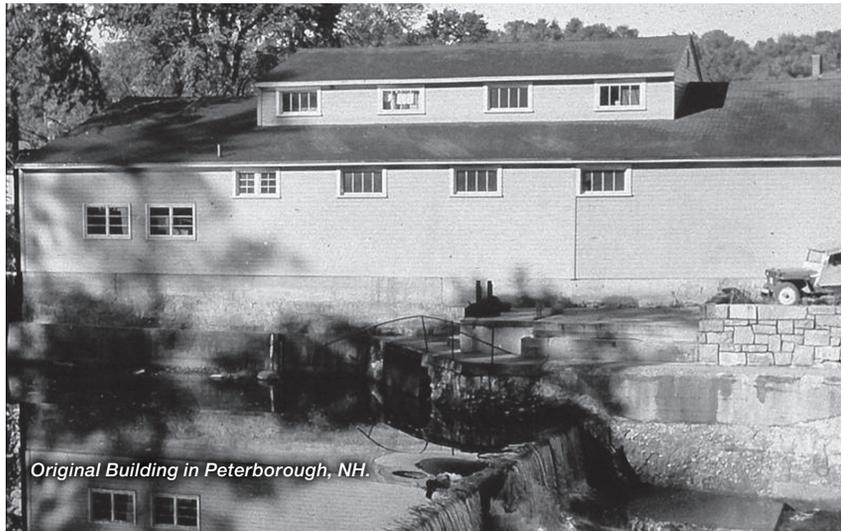
New Hampshire Ball Bearings, Inc. (NHBB) is turning 75 in 2021. This year is also the company’s 36th as a member of the MinebeaMitsumi Group.

In 1946, inside a small workshop located in the village of Peterborough, NH, the founders of NHBB began manufacturing fully ground miniature ball bearings for defense and aerospace customers, and later, for the emerging computer industry. Over time, the budding young company steadily grew its manufacturing capabilities to provide a broad range of high-precision solutions for a wide range of high-performance applications. NHBB’s custom-engineered products eventually found their way into aero engines, airframe control actuation assemblies, landing gear, helicopter rotor systems, space/satellite applications, UAVs, missile systems, medical/dental devices, and more.

to come as a trusted supplier to our customers in the markets we serve.”

NHBB was acquired in 1985 by MinebeaMitsumi (formerly Minebea), a multinational conglomerate based in Japan, which manufactures machined components, electronic devices and components, and Electro Mechanics Solutions® for a broad range of high tech, industrial, and consumer markets. MinebeaMitsumi’s ongoing investments in NHBB have spurred continued growth by developing new products and adopting more advanced manufacturing capabilities.

NHBB became a part of a newly established brand, *MinebeaMitsumi*



Original Building in Peterborough, NH.

Today, NHBB operates three domestic manufacturing divisions, employs over 1,400 workers, and supports a customer base that spans the globe. Responding to customer needs continues to be a key driver of NHBB’s growth. The company maintains a constant focus on partnering with customers on new product development and testing projects, which has led to industry-changing innovations.

“NHBB is proud of its rich history which began as an independent start-up company, and now continues as a thriving subsidiary of the MinebeaMitsumi Group, all while remaining a vital source of employment for the communities in which we operate,” said Dan Lemieux, President of NHBB. “Dedicated and skilled employees are the foundation of the company’s success, and we look forward to our continued growth in the decades

Aerospace, which was launched by MinebeaMitsumi in 2019 to bring about a tighter integration of its global production capabilities with key aerospace customers’ needs. A team of highly trained sales professionals, who have global account responsibilities, leverages the *MinebeaMitsumi Aerospace* brand to promote the collective capabilities and distinctive competencies of NHBB and its affiliated businesses.



Arthur Daniels
 Founder



Solar Power Project Approved

The Chatsworth campus, which is home to the NHBB Precision Division, will begin generating energy from the sun in 2021.

MinebeaMitsumi is tapping into southern California's abundant sunshine by moving ahead with plans to build a 1.4 MW-DC photovoltaic (PV) power facility at its Chatsworth, CA, building complex. The campus is occupied by New Hampshire Ball Bearings, Inc. (NHBB), NMB Technologies Corporation, and NMB (USA). Construction is scheduled to begin in early 2021 and end by midsummer.

The installation will comprise 3,183 solar panels mounted on the building rooftops and new carports in the employee parking lot. The panels chosen for the project are 440-watt crystalline PV modules manufactured by Sharp Energy Solutions Corporation (SESJ), a wholly-owned subsidiary of Sharp Corporation of Osaka, Japan. Sharp has a long history of advancing solar technology as a manufacturer of PV modules since 1963.

The system will generate an estimated 64% of the required energy needs of the Chatsworth campus, which encompasses two large buildings with a total footprint of 148,000 sq. ft. Over 100,000 sq. ft. of this space is devoted to production, while the remainder is dedicated to warehouse and office space. More than 500 employees spread among the three MinebeaMitsumi Group businesses work on the campus.

While the facility is projected to generate savings on electricity in approximately five to six years, it will immediately impact the company's environmental footprint. With solar power, MinebeaMitsumi can reduce its dependence on energy sources that emit CO₂ and other greenhouse gasses. This outcome directly addresses one of the company's key environmental initiatives: the prevention of global warming.

MinebeaMitsumi recognizes that global warming and the related issues of soaring energy prices and abnormal climatic conditions pose a significant threat to the sustainability of its business activities. To combat this looming crisis, each office and plant in the MinebeaMitsumi Group is proactively promoting energy efficiency initiatives.

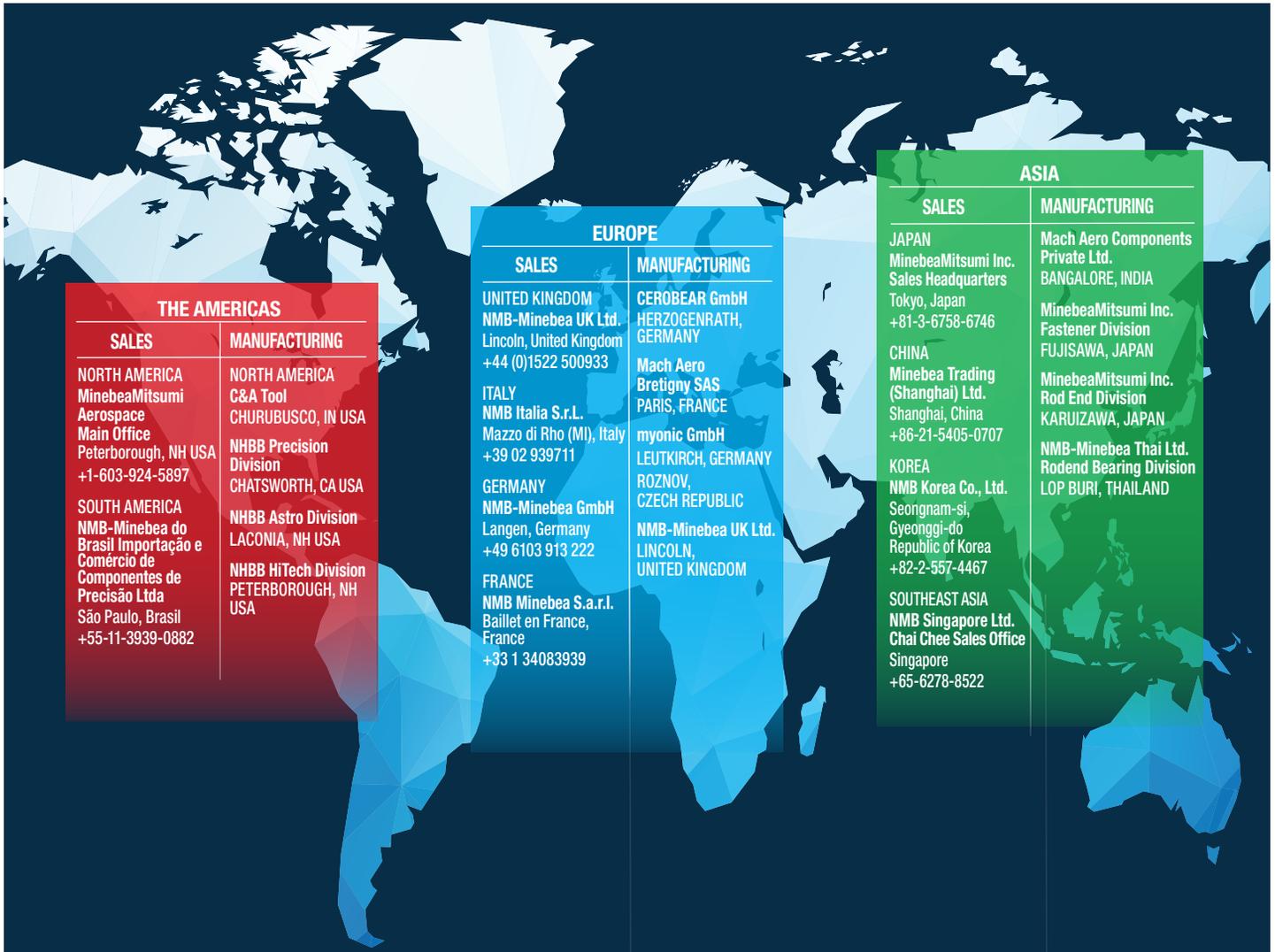
Before the Chatsworth solar project, MinebeaMitsumi installed in Thailand: a 1.88 MW, 35,531 sq. ft. solar array at the Lop Buri facility; and a 3.12 MW, 58,970 sq. ft. solar facility at the Bang Pa-in factory.

This year marks the 50th Anniversary of MinebeaMitsumi's acquisition of the Chatsworth campus.



MinebeaMitsumi Group expects the installation of 3,183 440-watt solar panels to generate 1.4 MW of electricity, which will serve approximately 64% of the campus's power needs.

Global Sales and Manufacturing Locations



MinebeaMitsumi Aerospace is committed to delivering the right products and solutions, no matter where in the world you are. Whether you need a high-quality standard product, a customized assembly, or a truly innovative solution, we can help you take your project from idea to successful launch. Our international team of highly trained sales and product specialists serves as your expert connection to the highly developed engineering, manufacturing, and new product development capabilities of our worldwide network of aerospace manufacturers. Before you begin your next project, contact **MinebeaMitsumi Aerospace**, the global brand that's bringing excellence together.

Find Us Online

The Aerospace Group's dedicated website provides convenient access to our worldwide network of aerospace manufacturers and our international team of highly trained sales and product specialists. Visit minebeamitsumi-aerospace.com to learn more.