



MinebeaMitsumi
— AEROSPACE —

eVTOL/ePlane



Bearings and
Machined Component
Solutions



AEROSPACE PRODUCTS SUPPLY CHAIN PARTNER

Introducing a proven aerospace supplier with a sharp focus on customer needs.

The platforms emerging today represent a leap forward in flight technology for urban mobility and regional transportation. Like the legacy platforms that came before, these ingenious vehicles require a wide range of reliable, aerospace-grade bearings and machined components sourced from proven suppliers. That's where MinebeaMitsumi Aerospace comes in. We have what it takes to deliver the right products and solutions to the eVTOL/ePlane industry. If you need a high-quality standard bearing, a customized assembly, or a truly innovative solution, we can help you take your project from the idea phase to successful lift-off.

MECHANICAL SYSTEMS FOCUS

Our solutions are used in a wide range of applications, a few of which are listed below.

PROPULSION

- Electric motors
- Gearboxes
- Mainshafts
- Turbo generators

INSTRUMENTATION & SENSORS

- Angular position sensors
- Gyroscopes
- Lidar detect & avoid sensors

AEROSTRUCTURES

- Braces
- Fasteners
- Landing gear
- Mounts

FLIGHT CONTROLS

- Rotor pitch control and retention
- Vectored thrust motion control
- Control surface actuators



APPLICATIONS ENGINEERING AND NEW PRODUCT DEVELOPMENT

Lean on our engineering and design expertise to gain a performance edge.

Vertical flight applications push mechanical components to their limits, challenging engineers to constantly find ways to improve corrosion resistance, increase life, reduce weight, or minimize vibration. COTS products may live up to the performance requirements of flight-critical applications, but if your application demands more than a standard solution can deliver, our team of experienced applications engineers can design an exact-fitting solution. For unprecedented challenges, our New Product Development specialists can help you to identify, develop, test, and qualify innovative solutions that radically improve performance and create significant value, perhaps even a market advantage.

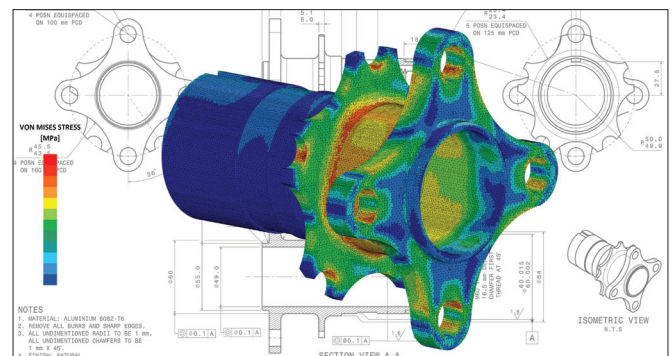
BEARING SYSTEM CALCULATIONS

Engineering data to support design intent.

We can provide the following analyses:

- Stress and predicted life
- Shaft & housing fits considering thermals
- Materials & lubrication system recommendations
- Flexible shaft analysis
- Failure analysis

ISO 9001/AS9100 | Boeing D6-82479 | Nadcap | ISO 14001



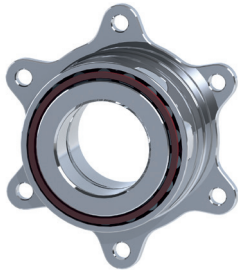
PRODUCTS AND SOLUTIONS

We keep pace with flight system evolution and a close eye on lifecycle costs.

From the tried-and-true to the unprecedented, we can satisfy a wide range of performance requirements through our tiered portfolio of products and solutions. We employ state-of-the-art and cutting-edge capabilities to make products from a wide range of proven aerospace materials that deliver superior benefits, enabling complex mechanical systems like yours to operate reliably at the upper limits. Other enhancements are also possible with our custom solutions, which often feature integrated facets that improve installation, fits, and overall function.

ROLLING ELEMENT BEARINGS

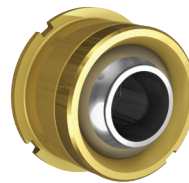
Miniature & instrument and precision ball brgs (angular contact, gothic arch, radial, multiplex), thin section brgs, roller brgs (cylindrical, tapered, out-of-round), planetary gearbox brgs, complex assemblies. OD sizes up to 25.6 in./650mm



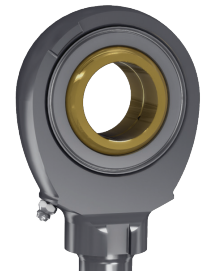
Hybrid Tapered Roller Bearing
Gearbox



Duplex Ball Bearing
Helicopter Pitch Control Assy



Spherical Bearing
Flight Control Actuation



Rod End
Landing Gear Actuation

R&S BEARINGS

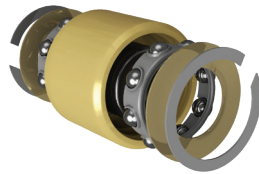
Rod end, spherical, sleeve, and loader slot brgs, patented self-lubricated liner solutions, self-aligning roller brg rod ends, large titanium bushings, swash plate brgs, custom-lined parts

AEROSPACE STANDARDS

Mil-Spec, Boeing, and Airbus approvals for airframe control ball brgs, bushings (plain/flanged), rod end brgs (plated/corrosion resistant), and spherical brgs (metal-to-metal/self-lubricating)



MS Rod End
Airframe Control



Duplex Ball Bearing
Airframe Control



Spline Head Bolt
Airframe



D-Head Bolt
Airframe



Self-Locking Nut
Airframe

LIGHTWEIGHT HARDWARE

High strength titanium bolts (D-head, spline-head, flush-head, etc.), self-locking nuts, fasteners, special designs, custom solutions

MACHINED/3D PRINTED PARTS & NEXT-UP ASSYS

Precision parts and assemblies of any size and complexity: linkages, rotatives, titanium brackets/mounts, additively manufactured (3D printed) components



3D Printed Stator Vane Segment
Aero Engine



Rotative/Blisk
Aero Engine

ADVANCED BEARING & MECHATRONIC SYSTEMS

High-value products combining electronic components and sensors with precision bearings and machined parts



Bearing Wear Sensor
Helicopter Pitch Control

PROTOTYPES

We are committed to offering fast lead times for prototypes. Estimations will vary based on the product's complexity. Please contact sales early in the design phase to ensure a timely delivery window.

GLOBAL SALES AND MANUFACTURING

Contact a sales office near you to learn more about our world-class capabilities.

MinebeaMitsumi Aerospace is committed to delivering the right products and solutions, no matter where in the world you are. 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.

Visit minebeamitsumi.com to learn about additional mechatronic products from the MinebeaMitsumi Group.

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