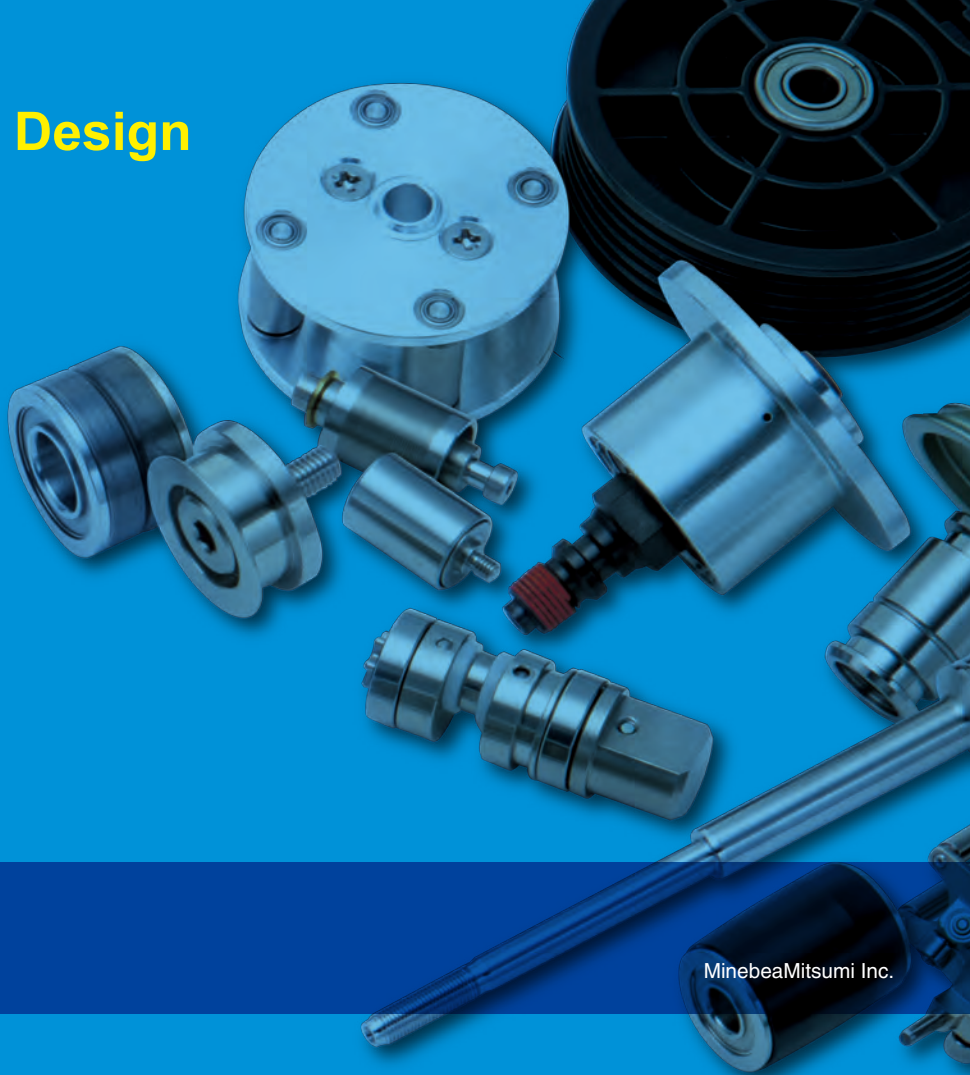


PMC

Recommendations



MinebeaMitsumi Inc.



PMC Uniqueness

When developing a compact, lightweight product or a high-speed motor for improved functionality, various problems and issues arise in order to achieve optimum drive performance.

For example,

“I want to increase the drive power of the motor, but the noise and vibration become too large,”

“I want to downsize the product, but there is no suitable bearing unit,”

“High-speed rotation causes runout and rattling, which makes the product unstable.

In order to solve these problems,
it is important to maximize bearing performance through
ultra-precision machining technology and assembly know-how.



Home appliances

Increasing the suction power also increases the noise and vibration.

Vacuum cleaners require powerful suction, a compact high-speed rotating motor plays a crucial role.

Challenges are noise and vibration suppression, weight reduction, and motor lifespan.

To address these issues, high-precision cartridge bearings with appropriate preload management are necessary.



→ Proper preload management requires experience and know-how.

Optical equipment

Smooth and precise movements
require meticulous and
delicate techniques.

The small bearings that support the gentle movement of the lens unit face many challenges in their integration, such as the need for precise alignment and delicate pressure input control, as even slight misalignment or instability in pressure balance during press-fitting directly affects performance.

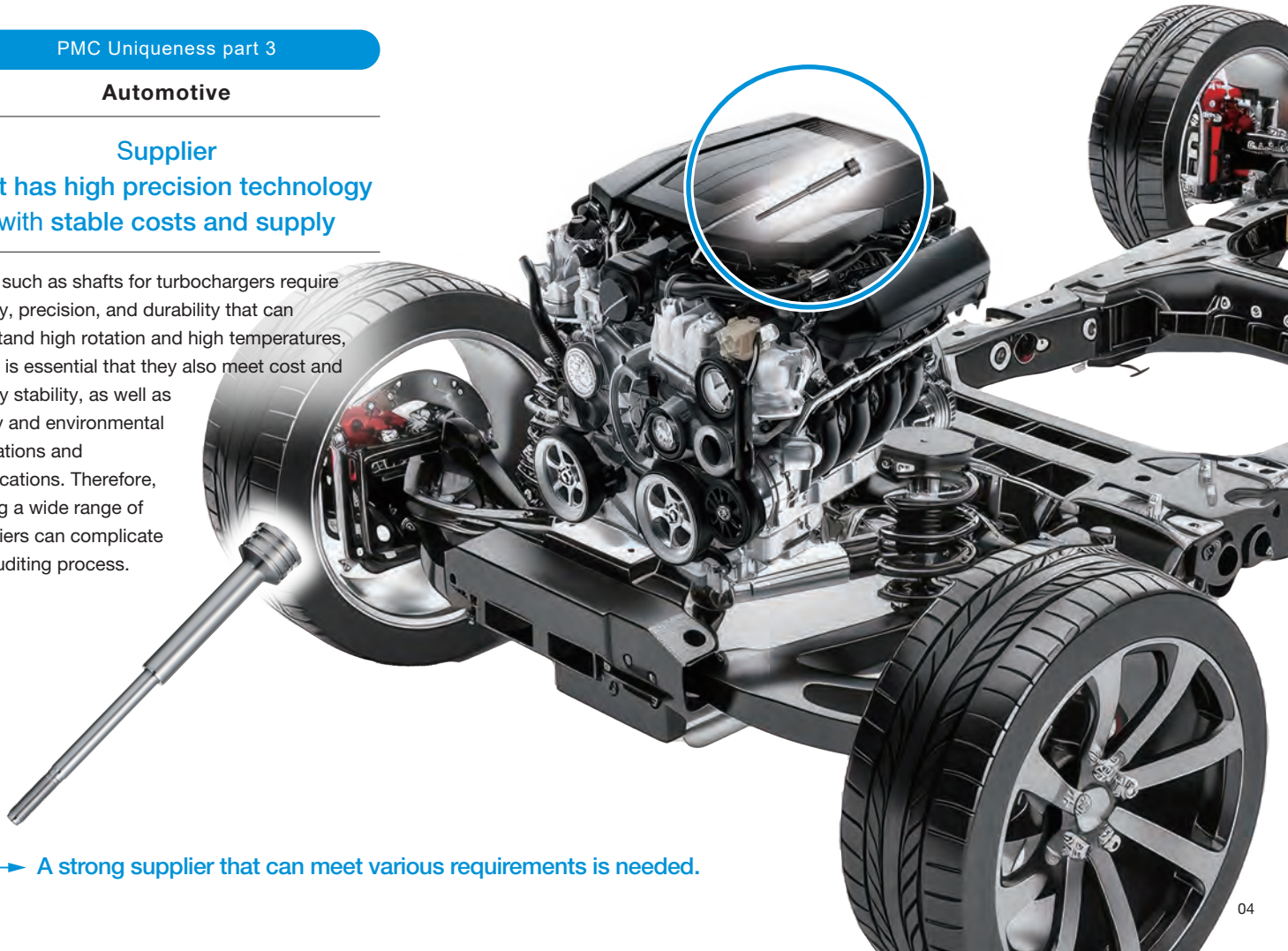


→ small-sized bearings require high-precision press-fit technology

Automotive

Supplier that has high precision technology with stable costs and supply

Parts such as shafts for turbochargers require quality, precision, and durability that can withstand high rotation and high temperatures, and it is essential that they also meet cost and supply stability, as well as safety and environmental regulations and certifications. Therefore, having a wide range of suppliers can complicate the auditing process.



→ A strong supplier that can meet various requirements is needed.

PMC Solutions

Minebea Mitsumi PMC (Precision Mechanical Component) assembly product uses its own high-precision ball bearings to solve the following challenges.

1. Rotational accuracy in bearing assembly state:

Due to proper selection and assembly, rotational accuracy can be guaranteed in the assembled state.

2. Reduction of assembly processes:

Deliveries can be customised that are easy to attach to counterpart parts, simplifying the bearing assembly process.

3. Reduction of management workload (delivery time, inventory management, incoming inspection):

No need for delivery time, inventory management, or incoming inspection for bearings and individual parts, reducing the workload managed by personnel.

4. Approach to various issues:

It is possible to address various issues faced by bearings (such as lifespan, vibration, rigidity, noise, etc.).

5. Quality management:

Acquisition of various certification standards (ISO 9001, IATF16949, ISO 13485).

6. Mass production and stable supply:

Achievable through the establishment of mass production systems in overseas factories.

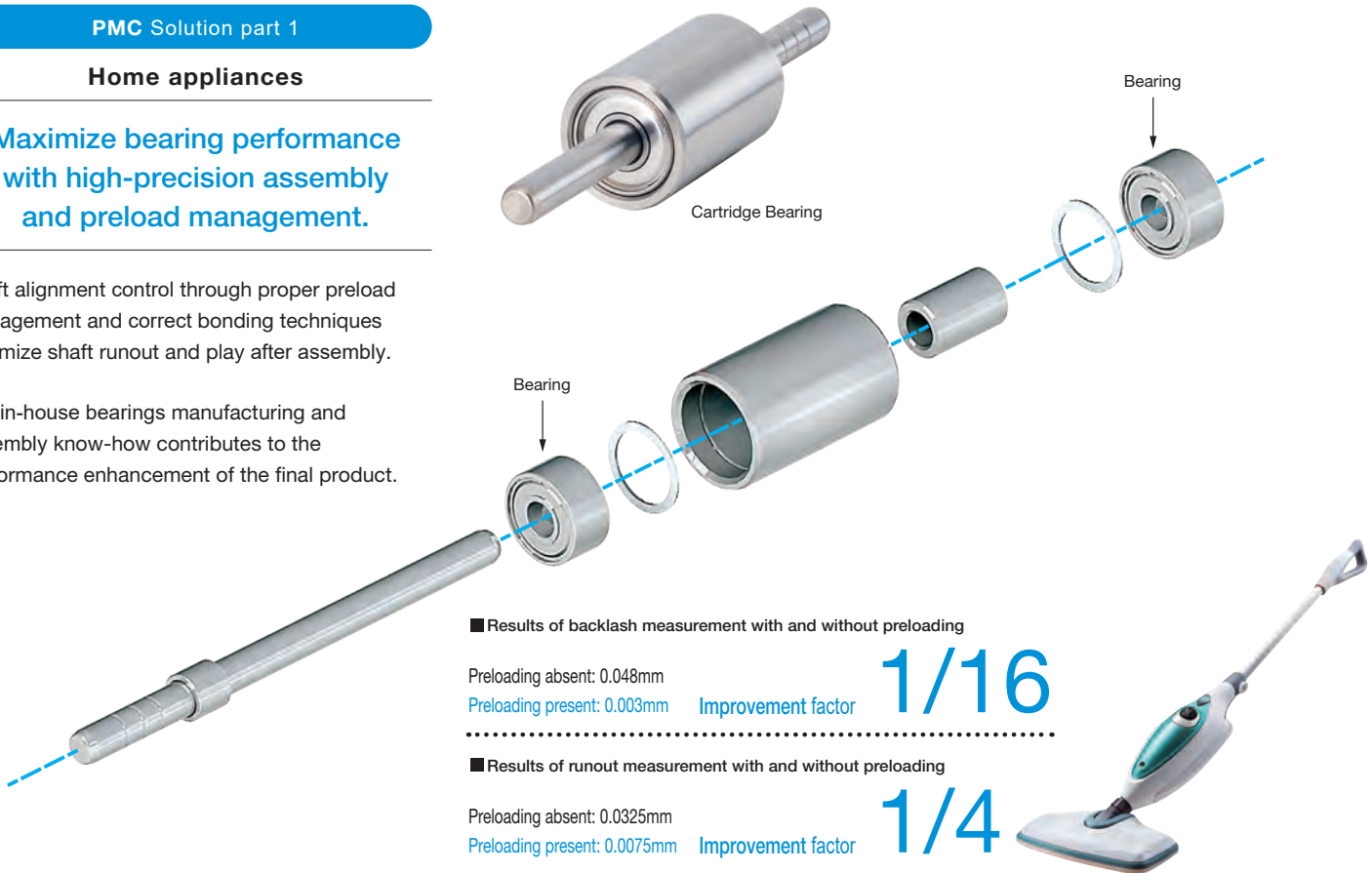
PMC achieves high precision and high rotational bearing quality.

Home appliances

Maximize bearing performance with high-precision assembly and preload management.

Shaft alignment control through proper preload management and correct bonding techniques minimize shaft runout and play after assembly.

Our in-house bearings manufacturing and assembly know-how contributes to the performance enhancement of the final product.

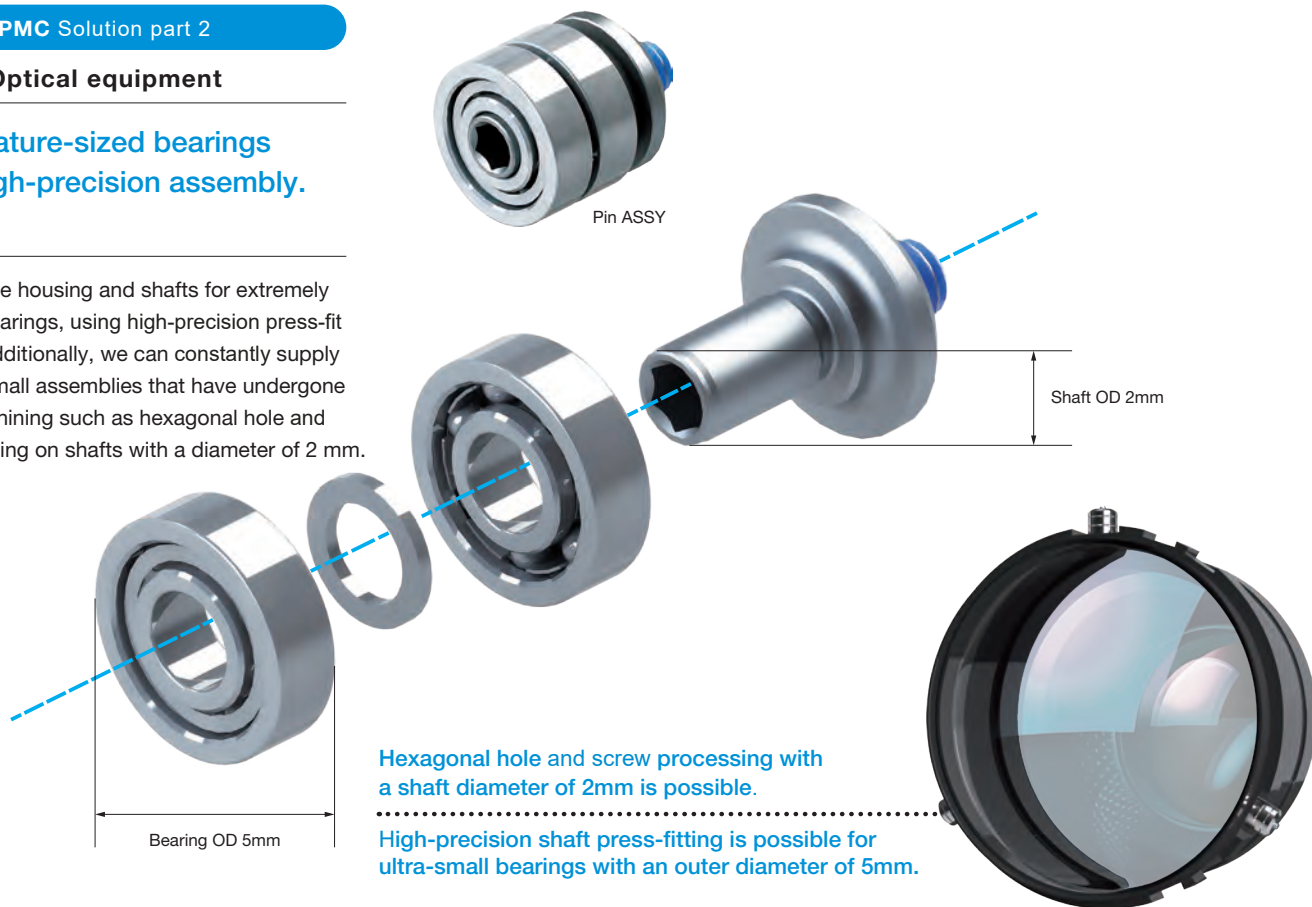


→ Appropriate preload for each bearing according to its individual characteristics.

Optical equipment

Miniature-sized bearings with high-precision assembly.

We can provide housing and shafts for extremely small-sized bearings, using high-precision press-fit technology. Additionally, we can constantly supply high-quality small assemblies that have undergone precision machining such as hexagonal hole and screw processing on shafts with a diameter of 2 mm.



→ Maximize the potential on the smallest size assembly.

Automotive

High-precision processing technology and integrated management to meet various demands of automobile manufacturers.

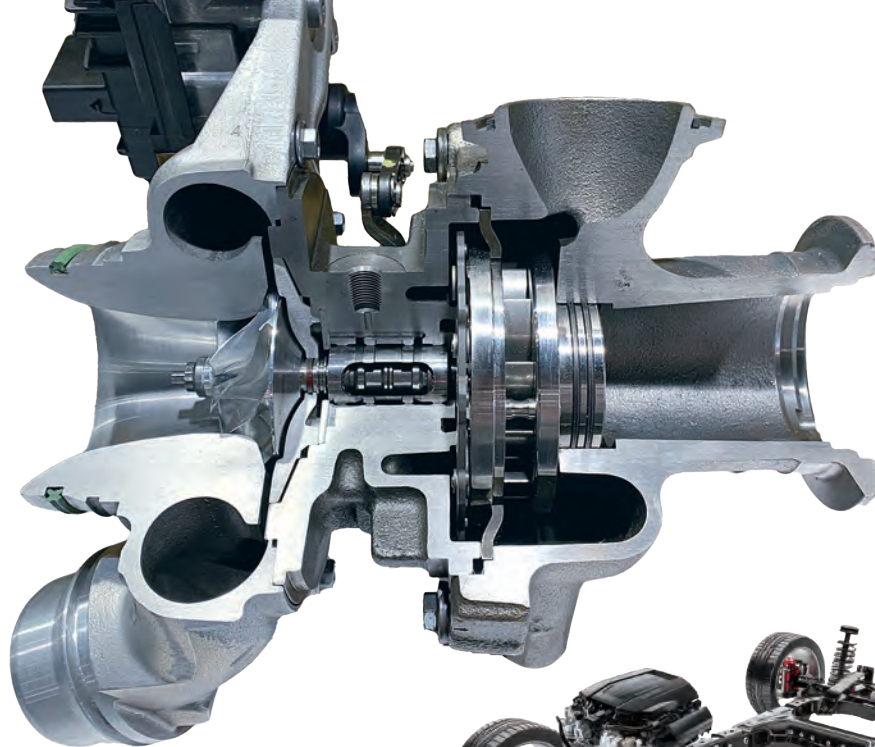
As a turbocharger shafts manufacturer, base on know-how experiences cultivated through the production of miniature ball bearings (outer diameter less than 22mm) with trusted world market share of 60%, we could complete all processes in-house, including development, forging, secondary processing, heat treatment, and polishing. This enables us to achieve high-quality mass production, ensuring stable costs and supply.



Journal Bearing



Shaft for turbocharger

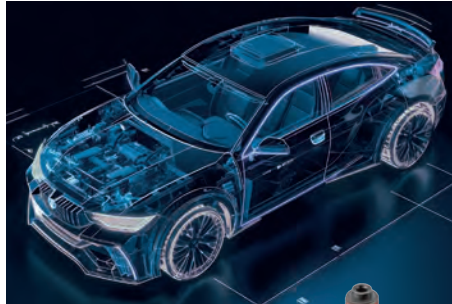


Miniature and small diameter ball bearings with an outer diameter of 22mm or less account for over 60% of the world market share.

60%

→ We create various added values through centralized management within the company.

**Proven track
record in many
industries.**



Automotive

Application:

Truck tire air pressure management components

Other examples are:

Shaft for turbochargers, high-pressure fuel pumps, piston pins, automatic sliding doors, etc.



Medical

Application:

Roller pumps for analytical instruments.

Other examples are:

Blood pumps, surgical robots, etc.



Home appliance

Application:

Parts for food mixers

Other examples are:

Vacuum cleaners, hair dryers, microwaves, etc.



Industrial machinery

Application:

Wire drawing machine for tires

Other examples are:

Textile machinery, fan motors, inkjet printers, chip mounters, etc.



Storage

Applications:

Pivot bearings for HDD magnetic head actuators with 80% of the global market share

Other examples are:

Tape guide components, etc.

High quality, mass production, and stable supply created by centralized management within the company.

Minebea Mitsumi Group runs a vertically integrated production system, to achieve both "precision machining technology" and "mass production" by managing from raw material to processing in-house.

At Karuizawa factory, which serves as the production HQ for overseas mass production plants mainly in Asia, it handles product and process development. The factory also accommodates small lot and prototype production. Whereas at BangPa-In factory, which is our Thailand largest manufacturing site, primarily focuses on large-scale production and stable supply.



[Development, Prototyping, Mass Production] Karuizawa Factory

We have a diverse range of equipment that enables high-precision processing, achieving consistent production.



Multi-spindle machining centers



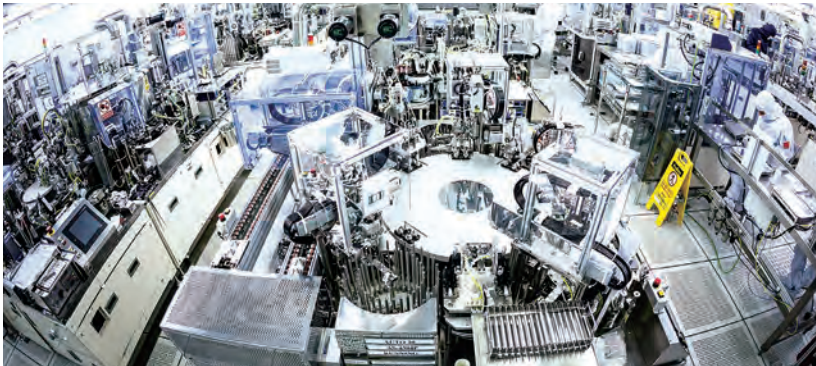
Automated turning machine



Automated Heat Treatment System



[Prototype and mass production] Thailand Bang Pa-In factory



Automated assembly line

Materials and Processes

Stainless bearing steel,	SUS3xx, SUS4xx, SUS6xx, etc.
steel materials,	SUJ2, SUMxx, SCMxx, etc
aluminum alloys,	A5xxx, A6xxx, etc.,
brass,	C3604, C6801, etc.,
resin,	POM, PEEK, etc.,
sizes,	outer diameter of 65mm or less, length of 440mm or less
heat treatment,	quenching, tempering,
processing,	cutting processing, grinding processing (centerless grinding, cylindrical grinding), milling, others,
surface treatment,	electroless nickel plating, hard anodizing, hard chrome plating, nitriding, DLC.

Customised specifications, please feel free to consult with us.

Lot Size

1,000pcs/Lot (guideline)

Other lot sizes are also possible, please feel free to contact us.

Owned facilities

CNC automatic turning machine single-axis spindle
 CNC automatic turning machine 6-axis/8-axis spindle
 Grinding machine (centerless grinder/cylindrical grinder)
 CNC milling machine
 Automatic press-fitting/Assembly machine
 Chucker machine
 Vacuum heat treatment

Above are some examples and many more are not listed here.



PMC is a custom-made product.

PMC offers products not as a "standard items" but completely custom-made products.

Our expertises, with rich experience and technology,
work on challenges while addressing each customer's requests and specifications,
creating unique products through optimal design, high-precision processing, and assembly.
If there have been products that were difficult to design and had to be compromised or abandoned,
kindly consider introducing PMC (assembly products using our own high-precision ball bearings).

We are experts in creating smooth drive with our own bearings.

Development of a competitive hub tailored for a single athlete.

In order to shorten the traveling time in a wheelchair athletics, I, as the developer, took on the challenge to develop a dedicated hub utilizing PMC bearing cartridge. There is no standard parts for competition wheelchairs and it requires customization for each athlete. Every day was spent to repeat making prototypes and testings base on my knowledge and skills as a bearing manufacturer. Even a slight structural differences had a significant impact on time. This difficulty laid in the fact that the athlete's "feel" could not be measured numerically but only through their feedback, we made efforts to optimise the wheelchair itself. Finally, we achieved a breakthrough time that satisfied the athlete and shared our joy. This dedicated hub was the "one and only" that the athlete and I believed in, and it became the catalyst for each of us to take a new step forward.



Technical inquiry



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