

# Metal Injection Moulding Technical

World Finest MIM Technology from Japan, "μ-MIM®"

Volume 03

Published by Taisei kogyo co., ltd

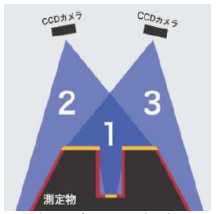


The next step into the future our high-performance metal

## 1. Measurement of fine parts with complicated geometry

There are a couple of important subjects in measuring dimension of fine parts with complicated geometry. It is not easy to clamp a small part securely and to assure the starting point of measurement. Another subject is physical difficulty to set a measuring device to contact the part at the exact point to be measured. Auxiliary clamping device may solve the fixing problem. It is, however, very difficult for conventional contact type measuring device such as micrometer or any 3D device to touch the edges of complex shapes.

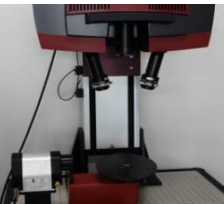
We have introduced an advanced noncontact type 3D device manufactured by GOM, Germany for dimensional measurement of fine MIM parts. The device is equipped with a couple of camera to obtain multiple images of a part at the same time. The image data are then converted to dimensional information with resolution within 2 micron. Comparing with CAD data, the analysis assures dimensional compatibility of MIM parts with high accuracy.



Triple scan system captures the images of each camera and the superposed image to analyze dimensional data with high resolution and speed.

The picture below shows a helical gear with seven teeth. Due to the small size and fine geometry, no conventional measuring device is applicable. Only the advanced device as mentioned above can provide us detail information of the part.

When you think about MIM production, please do not hesitate to ask us.



ATOSIII Triple Scan GOM Germany



Helical Gear O.D. 2mm, Height 3mm

## 2. Frontier of MIM parts of magnetic material

Ferromagnetic material which has high permeability but low coercivity is named "soft magnetic material". The material can be easily magnetized at low magnetic field, and demagnetized upon removal of the magnetic field. The material is applied to various industrial components such as electro-magnetic valves for hydraulic equipment and fuel supply system of automobiles, solenoid core, and sensor core.

Since most of soft magnetic components are manufactured by machining or compaction powder metallurgy, there are still some problems. We have studied manufacture of soft magnetic components by using metal injection moulding with the aid of governmental fund, and established a new manufacturing process.

Problem with conventional Manufacturing process	Machining	Powder Metallurgy
	Low yield of material	Low density of products
	Only simple shape	Limited dimension and shape
	Small lot production	

Solution with Metal Injection Molding	Metal Injection Molding
	High density of products
	Complex shape
	Large lot production
	High yield of material

By applying metal injection moulding, large lot production of components with complex shape is possible along with high yield of material. Various grades such as ferritic stainless steel, Fe-3Si, permalloy are available as net-shape products. Dimensional tolerance of ±0.2% is possible. Density of products is as high as 98%, exceeding the level of powder metallurgy. These advantages may reduce the cost to one tenth depending on the shape.

When you think about mass production of components with high dimensional accuracy, please ask us for more information.



Net shape products of soft magnetic material with complex geometry



## 3. Our plant in Thailand

Our oversee plant in Thailand started commercial operation of metal injection moulding in 2012. Manufacturing capability of the plant is 120 million pieces per month, which is the double of the main plant in Japan. Cooperating both plants supply customers the products varying in small to large lots. Micro precise production with metal injection moulding is our strength.



Thai plant (left) and the staffs (right)

## 4. Exhibition and convention schedule

World PM 2016 in Hamburg, Germany between 9<sup>th</sup> and 13<sup>th</sup> October 2016



COMPAMED 2016 in Düsseldorf, Germany between 14<sup>th</sup> and 17<sup>th</sup> November 2016



## Column for the TAISEI

My name is Tomoyuki Yokota. I'm the general manager of Taisei. I worked hard during the start-up of the Thai plant between 2012 and 2014 but now back in Japan. My hobby is building plastic robotics named "Gundam". If you are interested, please get in touch with me. Please get acquaintance with TAISEI!



I'm on the right.



My favorite v Gundam