Metal Injection Moulding Technical Newsletter

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

Volume 04

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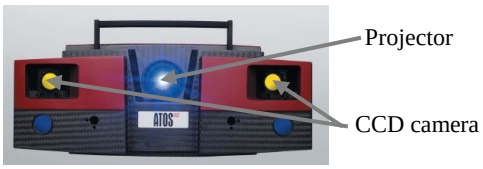
1. High accuracy measurement system supports production & QA

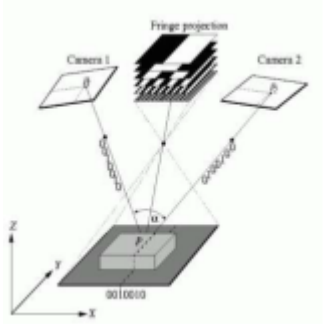
Conventional mechanical geometry measurement system cannot provide sufficient data for precise dimensional analysis or optimising mould design. We have introduced an advanced optical measurement system developed by GOM in Germany. Let us introduce its details as responding to request.



▲ATOS sensor geometry

The system named ATOS, applied optical 3D image analysis. The measuring principle is based on triangulation. The blue light, emitted from the projector, is reflected on the specimen surface and the reflected light captured by two cameras. From this, we gain a plane data or 2 dimensional scan data. The scanned data are processed to build 3D images in high resolution immediately after the measurement.

By verifying images of two cameras, influence of the surface property of the object such as light scattering is supressed.



▲Outline of measuring principle

Please contact us for further information about our measurement system and quality assurance.

2. Development new MIM material with antibacterial property

Copper additive improves antibacterial

We would like to introduce antibacterial MIM products newly developed by TAISEI KOGYO. In actual process, several manufacturing conditions must be optimised, though mixing some metal powder in feedstock could provide various properties to MIM components. By copper powder addition, we successfully obtained antibacterial MIM components without deteriorating mechanical properties.

In this study, the most important subject was how to add higher antibacterial property to MIM components while maintaining the original mechanical properties such as tensile strength, relative density and corrosion resistance.

Also the micro structure of the new MIM components was observed carefully using scanning electron microscope (SEM).

Experimental results

Copper powder addition to AISI304L MIM products,

- **Antibacterial property reveals**
- **Corrosion resistance improves**
- **No significant deterioration of mechanical properties**

The evaluation results of antibacterial property are summarized below.

Specimens	Count of viable bacilli	
	Immediately after the inoculation	After 24 hours
Contrast area	4.0×10^{5}	1.8×10^{7}
0 mass%Cu	-	5.4×10^{4}
3 mass%Cu	-	less than 10
5 mass%Cu	-	less than 10
8 mass%Cu	-	less than 10
10 mass%Cu	-	less than 10
SUS-XM7	-	less than 10

Evaluation result of antibacterial property using colon bacillus. In the contrast area, count of viable bacilli increases from $4.0x10^{5}$ to $1.8x10^{7}$ within 24 hours. In case of 0 mass% Cu, the count is $5.4x10^{5}$. In case of Cu content exceeding 3 mass% and conventional SUS-XM7material, the count becomes below 10.

3. Secondary work is applicable to MIM products

Plating, coating, polishing, etc.

We are often asked about the applicable post surface treatment for MIM products. It might come from common misunderstanding of difference between MIM and powder compacting.

Relative density of MIM products is as high as 95%, which is higher than conventional metal powder compaction products around 60 to 70%. MIM products have crepe or pear-skin surface since MIM products are aggregate of metal powder. However due to its high density, conventional surface treatments are applicable to MIM products surface. For example, plating, DLC coating, polishing, and so on.

Please do not hesitate to contact us for further information.

COMPAMED 2016 in Düsseldorf, Germany between 14th and 17th November 2016

Taisei Column

In a village in Offenburg, where Taisei`s European representative office is located, there is a "pumpkin festival" every autumn. The festival happens on a weekend in September when the pumpkins are harvested. Villagers use their creativity to make various decorations using the pumpkins from their gardens. Each year, prizes are given to the best creations. Please come to the festival!

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