Metal Injection Modling Technical Newsletter

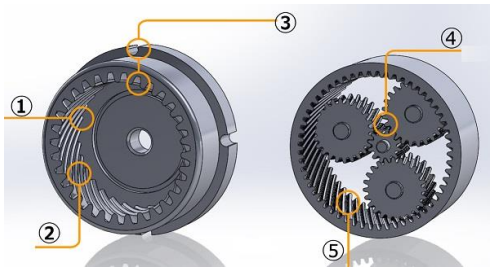
World Finest MIM Technology from Japan "μ -MIM ®"

Volume 8 Issued by:TAISEI KOGYO CO.,LTD

1. Technology for mass production of micro-fine parts

Micro gear parts are one of the major applications that utilise the strength of MIM, and in which Taisei Kogyo has a lot of experience. In this issue, we provide more detailed technical information about micro gears, based on our micro internal helical gears, which we announced at a medical exhibition MEDIX, Tokyo in June 2016.

The world's first micro internal tooth helical gear



▲Left, an inner gear only, the right incorporating a planetary gear

① Non-perforating shapes that cannot be processed by machining

The teeth of the inner gear have been processed right to the bottom. In general, it is not possible to process the teeth of such non-perforating shapes to the bottom surface. However, using μ-MIM technology, we can also achieve shapes that are impossible with machining.

② Helical fine shape

It is possible to mass produce helical gears of module 0.2 or less where the teeth are at an angle. As long as the angle of the teeth is not too steep, machining is also possible. However, as in the case of this gear, if the twist angle is 15 degrees, mass production is difficult with any method other than MIM.

③ High geometric tolerance

If the gear teeth locations are set at an angle against a cylindrical rim, it is difficult to maintain good reproducible accuracy in machining because the gripping position shift will be required for few times. On the other hand, MIM is capable of integrally moulding with high geometric tolerance accuracy in mass production.

④ Simulation of operation

As introduced in past technology news, we can simulate a set of gear operation by combining the measured 3D data of the μ-MIM product and CAD data of other gears . Since it is possible to get feedback for other parts before verification of the assembled prototype, there will be a contribution to the shortening of the development lead time .

⑤Measurement and evaluation of micro gears

Even gear manufacturers do not have a common technique for accurately measuring micro size gears due to uncovered by industrial standard. However, μ-MIM technology also covered measurement assurance applying leading inspection technology and latest measurement facilities.

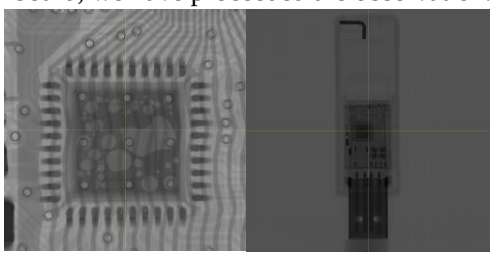
As shown by this internal gear, we have a lot of know-how in the fabrication of micro-fine parts. We have an impressive record of accomplishment of mass production by MIM, especially the parts that cannot be machined or complex shapes that do not justify the cost of production. When you need help in design and development, please contact us.

2. Technology to measure what we cannot see

Case study of X-ray CT measurement

In the evaluation of micro parts, we have applied a number of measurement devices and software.

Regarding one of those, X-ray CT measurement, after being asked whether it is possible to observe the internal IC board, we have proceeded the observation.



▲ Images of X-ray CT scan of interior of circuit board

<Measurement Results>

It is observed the void and the bonding state.

It is also confirmed the presence of structural defects are observed non-destructively, for example, the state of wire bonding, secondary battery electrode winding condition and electrolytic condenser paper or foil winding condition.

In addition to offering MIM solutions on production, we also provide measurement and evaluation services for micro metal parts.

Compamed in Düsseldorf next week!

Date:14-17th November

Time:10:00-18:30 every day

During the Compamed Taisei will be exhibiting some new samples including the internal helical gear introduced in this edition. Please make an appointment with us so that we can make sure we are available!

Hall 8b/Stand M17

Contact: Ms. Izumi Nakamura

Tel:+49 162 696 7837(mobile)

Izumi_nakamura@taisei-kogyo-net.co.jp

Taisei Column

Hello everyone, my name is Kanoko of the R&D center. My research focuses on porous metals and functional metals. My home is in Nara so people often tell me that I literally have a connection with deer. [The character Kano that is the first part of Kanoko's family name means "deer".] Actually I am not overly fond of deer, but whenever I go to the park near my home, the deer gather around me for some reason! My hobby is playing the trombone. Along with Mr. Okubo, who appeared in the last newsletter, if you wish I would be happy to come and give a performance at your premises.

R&D Osaka Kanoko

Published by: TAISEI KOGYO CO.,LTD

TEL:+49-781-6301-4281/+49-162-6967837 URL: http://www.taisei-kogyo.com/en

Head office
26-1 Ikedakitamachi Neyagawa, Osaka 572-0073 Japan

European Representative Office
In der Spöck 12 (im TPO), 77656 Offenburg, Germany