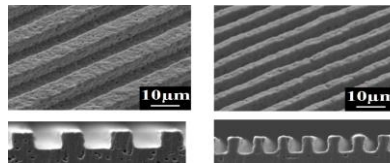


1. Leave the thin-walled components to μ-MIM

In any processing, manufacturing of thin-walled components including maintaining the accuracy is quite difficult since these are easily affected thermally or mechanically. However, from the miniaturization and weight saving point of view, the thin-walled components are required in every industry. In conventional MIM is also difficult to manufacture the thin film components since injection or removing from the mould is required technique and experiences. Additionally, during the degreasing and sintering process, serious deformation will be observed even if it was successful in injection or forming of thin-walled components. However, Taisei Kogyo has studied and developed to apply our μ-MIM technology to the thin-walled components and successfully mass produce less than 100 μm wall component. The thin-walled components or minuteness shape mass production will be realised by our μ-MIM processing technology.

2. Break-through in raw material pellets

Below SEM image is our μ-MIM product. We have realised a structure of 5 μm morphology. It is impossible to process by the conventional MIM, or few years ago for even our μ-MIM since there was limitation of purchasing the fine metal powder. Though today our μ-MIM has been realised the single micron order morphology. In general MIM, it is applied the diameter of few dozen microns metal powder, and it is not able to realise less than 500μm structure. However, we employ the latest fine powders and also classify the diameter to achieve less than 10 μm morphology. This achievement is because of our binder system, which developing by ourselves.



SEM images

3. Break-through in mould and forming technologies

It is difficult to manufacture stably even the products with 0.5 mm thickness part by the general MIM technology. One of the reasons is the rheological characterization of the raw materials (Feedstock). The MIM feedstock has lower fluidity comparing with the resin feedstock for plastic injection moulding due to the metal powder. Moreover, the metal powder has high thermal conductivity. Thus, in the cool mould the feedstock temperature is decreased faster and this will help the fluidity even lower. Therefore, it is required high mould design technology and lots of injection knowhow in MIM production. Taisei Kogyo applied the various knowhow and mould design simulation to realise thin-wall components mass production. We recently realise a pipe component which has various flow passages, thickness of 0.2 mm or less at whole part as shown in below figure.



4. Process change of soft magnetic materials

Materials which have weak magnetic power retaining and have high permeability are called soft magnetic materials. Soft magnetic material is strongly magnetized under magnetic field only, and it is used in various

industries as the functional materials with additional value.

Recently, it is used more in various purposes and industries such as pneumatic-hydraulic equipment, solenoid valves for fuel injection unit of automobile, solenoid core, injector core, plunger, torque sensor core, etc. Generally the soft magnetic parts are manufactured by machining or powder metallurgy. Therefore, it is limited to mass produce the soft magnetic components required high accuracy or microstructure morphology, Taisei Kogyo has developed MIM production the soft magnetic parts supported by ministry of economy, trade and industry, Japan. Our developed technology will realise the mass production of small complicated design, integration of magnetic and non-magnetic material in a part without magnetostrictive stress.

Taisei Column



Hello Everyone.

My name is Vergne Marcelo and I come from Brazil. I joined Taisei Kogyo in May 2017 so I am still new.

I work as an engineer in the quality assurance department. Taisei Kogyo with its micro-MIM technology is a workplace which makes me an effort to do my best everyday and there are always new challenges. My speciality is simulation/analysis and programming, however, it is not easy to analyse new composite materials or micro parts that are very complicated. And I gain new experiences through these work. My hobby is travelling and Capoeira (an Afro-Brazilian martial art). I studied in Canada for 2 years and now I live in Japan since 2016. I play Capoeira almost every week with my friends. Capoeira is a good sports where you can enjoy dance, music and acrobatics. If you are interested in MIM, studying abroad, travelling or Capoeira, let's be friends!