Press Release

Rheinbach, Germany, March 2020

Feedstocks for Ceramic Injection Moulding (Hall 23 / Stand A32)

INMATEC Technologies GmbH, founded in Rheinbach/Germany in 1998 with the General Manager Dr Moritz von Witzleben, has now more than 60 employees. It is the world's leading developer and producer of feedstock for the Ceramic Injection Moulding (CIM) process.

The CIM process is established now on the market as a shaping process for ceramic components. This is reflected in the growing need for ceramic feedstocks. The INMATEC company reacted to this and expanded the capacities for feedstock production in 2018. Two new processing units were put into operation and the number of production employees was doubled.

In addition to a wide range of standard feedstocks based on different ceramic powders which already cover many requirements, the actual core business of the company is the manufacturing of customer-specific solutions.

The feedstock development starts in a lab-scale size, in order to limit the development costs for the customers

with the often expensive raw materials. The transfer to the production scale can be done with the same parameters without further adjustments, because the development is carried out on the production machines. By having a wealth of experience and cooperating closely with the customer directly at the market INMATEC is able to carry out powder developments to customers requirements. INMATEC is a development partner, service provider and producer at the same time.

INMATEC is free in the choice of the raw materials – regarding the ceramic powders and the thermoplastic binder systems as well. Besides the well-known INMAFEED binder system and the younger INMAFLOW binder system the company has expanded its product range to polyoxymethylene (POM) based CIM - feedstocks.

INMAFEED feedstocks work on the basis of a polyolefin/wax-based binder system. The debinding stage is based on a two-step process, with the first step in water and the second step in a thermal debinding furnace with precise temperature control. This wax-based system has been approved for many years and works without any chemicals or acids. The total time needed for debinding is depending on part geometry, wall thickness and the physical properties of the ceramic powder used in the feedstock. Very fine powders, such as zirconia, need longer debinding times.

INMAFLOW feedstocks work on the basis of a polyamide-based binder system. These feedstocks show low viscosity and are perfect for thin walled parts and long flow distances. Debinding is again a two-step process, with the first step in acetone and the second step via thermal debinding, as with the wax-based feedstocks.

One processing innovation of our feedstocks is their usage for the Additive Manufacturing (AM) technology. Additive Manufacturing offers a number of solutions for the ceramics industry, one being Fused Filament Fabrication (FFF), also known as Fused Deposition Modelling (FDM). This is a manufacturing method in which an endless filament is used as a semi-finished product which is melted and deposited under a heated nozzle. Ceramic filaments for FFF have been developed and made from INMAFLOW K2010 feedstock (based on $Al_2 0_3$ powder and polyamide-based binder system). Ceramic parts have been produced using FFF which shows a dense microstructure after sintering thanks to the highly filled nature of the feedstock.

INMAPOM feedstocks are based on a polyacetal binder (POM), a semi-crystalline thermoplastic material with good processing characteristics, high dimensional stability, high rigidity and good warm strength. Debinding takes place during a single debinding stage in a catalytic

debinding oven. The catalytic debinding process, which is widely used in the PIM industry, can be used as part of a fully automated production process with continuous 24/7 operation.

With all three CIM feedstock types INMATEC states that it is completing its objective of offering the complete range of binder systems for the Powder Injection Moulding market. Depending on the properties of a CIM part, its production volumes and any regional regulations and market needs, a customer has the freedom to choose one or more ceramic feedstock based on INMATEC´s three different binder systems. The three CIM feedstock systems are globally available for industrial-scale projects. All over the world full technical support is offered by a team of experienced experts in Ceramic Injection Moulding.

(4381 Characters)

Figure captions

(Inmatec_1_2020.jpg)

Feedstock for Ceramic Injection Moulding manufactured by Inmatec Technologies GmbH

(Inmatec_2_2020.jpg)

Filament coil made from INMAFLOW K2010 by Fraunhofer IKTS/DE

Press contact

CERAMIC APPLICATIONS, Karin Scharrer, k.scharrer@goeller-verlag.de

TREFFPUNKT KERAMIK
CERAMIC **APPLICATIONS**

Hannover Messe, Hall 23, Stand A32