

## INMAFEED K1012

### - Technical Datasheet

The feedstock is based on a zirconia powder ( $ZrO_2$ , 94.5 %,  $Y_2O_3$ -partially stabilized) and a wax based binder system for the powder injection moulding process.

Injection moulding of this feedstock is possible on standard injection moulding machines. Due to the abrasive behaviour of ceramic powder we strongly recommend production with cylinder, screw and mould made from hard metal only.

Green parts need a binder removal in a two-step debinding process before being sintered.

First debinding step is dissolving the binder in a water bath.

In the second debinding step the remaining binder is thermally removed.

These general guidelines are based on the processing of test parts with a wall thickness of 5mm.

The recommendations are considered to work as a standard guideline and have to be adapted to individual wall-thickness and part-design. For more details please contact us.

#### Feedstock: Specification

##### **Typical material properties**

<i>Product</i>	Feedstock for ceramic injection moulding process
<i>Binder basis</i>	polyolefinic based binder system
<i>Appearance</i>	White granulates
<i>Storage and Lifetime</i>	Product can be used for approx. 1 year after opening if stored dry at room temperature. Vessel has to be closed airtight thoroughly after feedstock withdrawal.
<i>Quality after sintering</i>	$ZrO_2$ , 94.5 %, $Y_2O_3$ -partially stabilized
<i>Density</i>	6.05 g/cm <sup>3</sup>
<i>Shrinkage (approx.)</i>	22.0 %
<i>Mould factor (approx.)</i>	1.28

##### **Typical processing properties**

<i>Mould temperatures</i>	55 – 65 °C
<i>Temperatures heating zones and nozzle</i>	155 – 165 °C
<i>Debinding process</i>	Two step debinding process
<i>First step</i>	Water bath
<i>Second step</i>	Thermal debinding up to 300 °C
<i>Sintering temperature</i>	T <sub>max</sub> 1500 °C, in air

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### Recommendation Injection Moulding Process

<i>Settings Temperature</i>	<i>Recommendation</i>
<i>Mould nozzle side</i>	56 °C
<i>Mould ejector side</i>	58 °C
<i>Material feeding zone</i>	40 °C
<i>1. Heating zone</i>	159 °C
<i>2. Heating zone</i>	160 °C
<i>3. Heating zone</i>	161 °C
<i>4. Heating zone</i>	162 °C
<i>Nozzle band</i>	162 °C

<i>Settings injection moulding</i>	<i>Recommendation</i>
<i>Rotation speed of screw</i>	5 – 6.5 m/min
<i>Back pressure</i>	20 bar
<i>Decompression</i>	0.25 cm <sup>3</sup>
<i>Decompression speed</i>	0.5 cm <sup>3</sup> /s
<i>Injection speed</i>	5 – 30 cm <sup>3</sup> /s
<i>Holding pressure</i>	2/3 of switch over point pressure
<i>Holding pressure time</i>	0.5 – 2.0 sec

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