

TENAC™ (POM) for Metal Injection Molding

The best binders for thermal de-binding system

What is Metal Injection Molding (MIM)?

MIM is a process for manufacturing miniature high-precision metallic components. In this process, a metallic powder is first blended with a binder, then injection molded, processed to remove binder components and sintered.

MIM binders are generally composed of various materials, especially for thermal de-binders, mixing multiple materials is required to control binder volatilization temperature.

POM has excellent mechanical strength and can be decomposed without residue when acid or heat is applied, which makes it ideal for MIM binder materials.

Product overview

Asahi Kasei offers the best thermal de-binding binder for MIM with the company's compounding technology to disperse multiple resins.

•TENAC™-C FF520:

Ultra-high flow POM-C(MFR: 120 g/10min)

•TENAC™-P PT220:

Polymer binder for thermal de-bindingsystem

•TENAC™-P PT120:

All-in-one binder for thermal de-bindingsystem

Application fields

- Precision instruments
- Automotive components
- Smartphone components
- Medical devices



Properties of Sintered Parts

- Test specimen: ISO 2740
- Feedstock: Binder / 316L = 35 / 65 vol%
- 316L particle size: D50 = 9.3 μm
- De-binding process: Thermal de-binding
- Sintering temp.: 1,350 °C

| Metal | | Stainless steel 316L | |
|------------------|-------------------|----------------------|-----------|
| Binder | | TENAC™-P PT120 | Reference |
| Density | g/cm ³ | 7.72 | 7.67 |
| | σ | 0.00 | 0.01 |
| Tensile strength | MPa | 512 | 470 |
| | σ | 0.7 | 65.0 |
| Tensile Strain | % | 52.5 | 43.0 |
| | σ | 0.6 | 14.8 |

The data shown are typical values obtained by proper testing methods and should not be used for specification purposes. The data may be changed because of improvements in properties

Benefits for customers:

- Good processability due to excellent binder flowability
- Excellent strength of sintered parts due to low voids and high-density
- Consistent production of high-quality products with minimal variation
- Reduction of environmental impact by heat de-binding process that does not use acids or organic solvents

Further Information

<https://www.asahi-kasei-plastics.com/en/trend/powder-injection-molding-01/>

