

The MIM Process

Applying fundamental techniques results in parts with superior quality and dimensional repeatability.



FEEDSTOCK MIXING

Metal powders are carefully formulated with polymeric binders, **forming a uniform mixture**, cooled, granulated, and then fed into the molding machine.



MOLDING

During this step, the **feedstock is heated and injected** into the injection mold and the part is created. The result is termed a "green" part.



Virtually no waste



Consistent, cost-effective



CATALYTIC DEBINDING

Utilizing polymer chemistry, a catalyst is introduced to **remove 90%** of the binder from the green part. The result is termed a "brown" part.



Retains its shape



SINTERING

At the lower temperatures of the sintering cycle, the residual polymer binder is removed. As the temperature increases, sintering **allows particles to fuse and bond**, bringing the structure together to its final shape and size.



Part density is 96% - 99%



Understanding Metal Injection Molding (MIM)

MIM is a production process that can produce a high volume of smaller, complex, precision-shaped parts — without cost-prohibitive machining — in fewer steps.

MIM Works Best for Parts Requiring:

- Complex part geometry
- Complex machining
- Multiple secondary operations
- Multi-piece assembly conversions

The Benefits of Using MIM

- Cost effective
- Precision for complexity
- Reduced lead times
- Superior mechanical properties
- Excellent surface finish
- Low to extremely high-volume capabilities
- Variety of materials

50%
less
cost

with MIM than machining — without sacrificing precision.

Component Design Considerations

A parting line, gate location, and provisions for sintering are required to use MIM for your parts.

Parting Line

The plane in which two mold halves meet; a perpendicular orientation to the plane of the parting line facilitates part removal from the mold.

Gate Location

Directs material flow into the part detail of the mold and provides a balance between product and processing requirements.

Provisions for Sintering

When possible, part designs should include a flat surface for sintering; otherwise, custom setters are utilized for highly detailed geometries.

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Bringing Possibilities to Life

Phillips-Medisize, a Molex company, is a global leader in front-end design, development, and manufacturing solutions with over 45 years of experience in metal injection molding and plastic injection molding. We take an innovative, collaborative approach to every project and have earned a reputation for producing complex, high-quality parts within an accelerated timeframe.

We offer end-to-end services — working with you as early as the design phase — and comprehensive MIM facilities, including in-house metrology lab testing and measurement, and full geometric inspection with statistical process control. As a result, we're able to maintain tight control of the Metal Injection Molding process for quality, consistency, and cost management.