BIOMERICS™
We Improve and Save Lives

# Vertically Integrated Contract Manufacturing

## METAL INJECTION MOLDING (MIM)

- MIM Machines: 26
- Total Furnaces: 16
- Certifications: ISO 13485, ISO 9001, ASTM B883-19
- Vacuum Furnaces: 7
- Debinding Furnaces: 5

## Vertically Integrated Metal Injection Molding Services

Through a strategic partnership, Biomerics has the metal injection molding (MIM) capabilities needed to produce specialized, complex micro metal components for interventional medical devices. Our MIM design, materials compounding and manufacturing services ensure we meet the precise specifications for your metal components. Combining MIM with our other micro metal processing capabilities, our vertically integrated Micro Metals Division covers the full range of metal processing needs for interventional medical device applications.

## Superior Micro MIM Capabilities

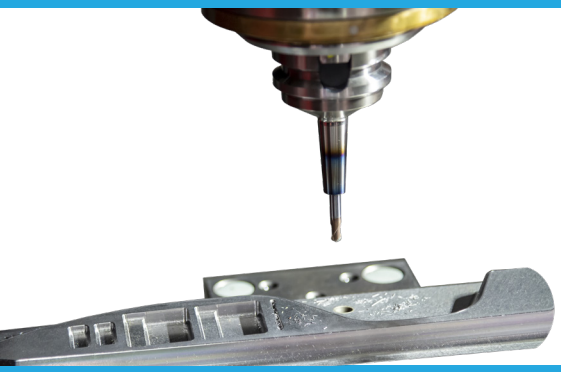
Our Metal Injection Molding Center of Excellence has the capacity to manufacture high-volume runs of complex metal components. We can produce medium to micro MIM parts to the following specifications:

- Mass: 0.01-450 g
- Wall thickness: 0.1-10 mm
- Part size: 0.2-200 mm
- Hole diameter: as small as 0.3 mm
- Dimensional accuracy: +/-0.5% inch/inch & less, without postprocessing
- Surface finish: Ra 0.95-1.30 µm without polishing
- ISO 13485
- ISO 9001
- ASTM B883-19

## Tooling Design & Material Compounding

Our micro metal injection molding experts work with you to design tooling for your intricate metal components. We also provide custom feedstock compounding services. We work with a wide variety of metal alloys, including:

- Iron-based alloys
- Stainless steels
- Tool steels
- Controlled expansion alloys, including Kovar
- Soft magnetic alloys
- Tungsten alloys
- Hard metal alloys
- Low alloy steel
- High alloy steel
- Cemented carbide
- Heavy alloys



## Secondary Operations

While the MIM process reduces the need for many secondary operations, some specialized components may require one or more of the following operations, all of which we can provide to you:

- Coining
- Magnetic polishing
- Electropolishing
- Machining
- Heat treating
- Plating/coating
- Tapping/reaming
- Black oxide coating
- Tumbling
- Bead blasting
- Hot isostatic pressing (HIP)

Learn more at biomerics.com/metal-injection-molding

ISO 13485:2016 | FDA registered

Rev. 1/29/26

# BIOMERICS'
# METAL INJECTION MOLDING (MIM) MATERIAL OFFERINGS

## A DIVERSE SELECTION OF METALS

*Metal injection molding uses a variety of materials, including low and high alloy steels, cemented carbides, and stainless steels. These materials offer a balance of strength, durability and versatility.*

### METAL INJECTION MOLDING MATERIAL OFFERINGS

| | Low Alloy Steels | Characteristics | Applications |
|---|---|---|---|
| Low Alloy Steels | Fe-Ni, FN02, FN08, 4140, 8620 | High strength & hardness | Structural |
| Iron-Based Low Alloy Steels | SUS 304 & 304L, SUS 316, 316L (austenitic) | Nonmagnetic & good corrosion resistance | Medical devices & wearable devices |
| | 410L, 430 (ferritic) | Good magnetic response with corrosion resistance | 3C & optical communication parts |
| | 420J, 440C (martensitic) | High strength, hardness & wear resistance | Hinge, nozzle & gear |
| | 17-4PH (precipitation hardening) | High strength & hardness | Medical devices |
| Tool Steels | M2, H13 | High strength | Wear-resistant parts |
| Super Alloys | HK30, Inco718 | High temperature resistance | Aerospace parts & turbo |
| Soft Magnetic Alloys | Fe-Ni50, Fe3Si, FeCo50, FeCoV | Soft magnetic | Core, shield & auto parts |
| Controlled-Expansion Alloys | Kovar/F15 (4J29), Invar | Hermetic seals | Electronics applications |
| Tungsten Alloys | W-Ni-Fe, W-Ni-Cu | High density | Vibrator |

**Reference: ASTM B883-19 & -24, Standard Specification for Metal Injection Molded (MIM) Materials for materials lists, compositions and properties**

# TYPICAL MATERIAL PROPERTIES

*We can process a wide range of materials for your metal injection molding needs.*

| Materials | | Density | Hardness | Tensile Strength | Elongation |
|---|---|---|---|---|---|
| | | g/cm³ | Rockwell | MPa | % |
| Iron-Based Low Alloy Steels | MIM-2200 (S) | 7.65 | 45HRB | 290 | 40 |
| | MIM-2200 (HT) | 7.65 | 50HRC | 380 | 20 |
| | MIM-2700 (S) | 7.65 | 69HRB | 440 | 26 |
| | MIM-2700 (Carbonitriding) | 7.55 | 55HRC | 830 | 9 |
| | MIM-4650 (S) | 7.55 | 90HRB | 700 | 11 |
| | MIM-8620 (S) | 7.55 | 48HRC | 1655 | 2 |
| | MIM-8620 (S) | 7.5 | 85HRC | 445 | 20 |
| | MIM-8620 (HT) | 7.5 | 35HRC | 800-1300 | 5-9 |
| Stainless Steels | MIM-316L (S) | 7.8 | 67HRB | 520 | 50 |
| | MIM-304L (S) | 7.75 | 60HRB | 500 | 70 |
| | MIM-17-4PH (S) | 7.6 | 30HRC | 900 | 6 |
| | MIM-17-4PH (HT) | 7.6 | 40HRC | 1185 | 6 |
| | MIM-440C (S) | 7.5 | 45HRC | 700 | 15 |
| | MIM-430 (S) | 7.5 | 65HRB | 410 | 25 |
| | MIM-420 (HT) | 7.25 | 45HRC | 900 | 6 |
| | MIM-410 (HT) | 7.25 | 40HRC | 900 | 7 |
| | MIM-SUS310S (S) | 7.40 | 67HRB | 505 | 39 |
| | MIM-SUS631 (S) | 7.55 | 86HRB | 705 | 42 |
| | MIM-SUS301 | 7.60 | 97HRB | 753 | 12.7 |
| Tool Steels | M2 (S) | 7.9 | 60HRC | – | – |
| | M2 (HT) | 7.9 | 63HRC | – | – |
| | S7 (S) | 7.2 | 45HRC | 1550 | 3 |
| | S7 (HT) | 7.2 | 59HRC | 1850 | 2 |
| Expansion Alloy | MIM-Kovar F-15 (S) | 7.8 | 70HRC | 450 | 32 |
| Soft Magnetic Alloys | FeNi50 | 7.77 | 50HRC | 390 | 17 |
| | FeSi3 | 7.5 | – | – | – |
| Tungsten Alloys | 95% W-Ni-Fe | 18.1 | 30 | 960 | 25 |
| | 97% W-Ni-Fe | 18.5 | 33 | 940 | 15 |
| Hard Metal Alloy | YG8X | 14.9 | HRA90 | Bend strength 2300 | – |