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

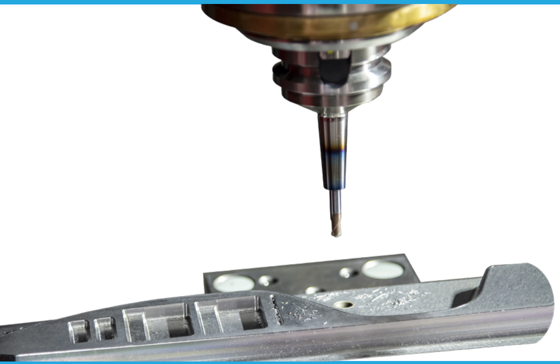
Our Metal Injection Molding Center of Excellence has the capacity to manufacture high-volume runs of complex metal components. We can produce medium to micro MIM parts to the following specifications:

- 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)

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/cm^3	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	–