Metal Injection Molding & Investment Casting

Medical Industry - Medical Parts

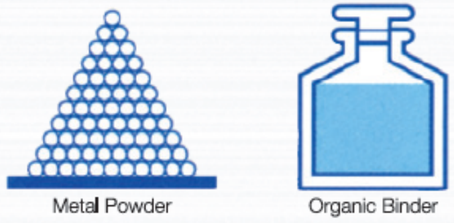
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Metal Injection Molding Process Overview

MIM produces small precision components for a smaller cost when compared to other methods.

1 Metal Powder Binder

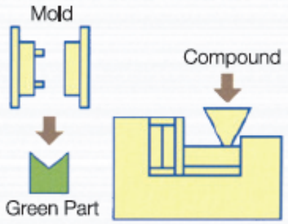


2 Kneading



Kneading fine Metal Powder and Organic Binder together to produce MIM feedstock

3 Injection Molding



Feedstock is molded into the mold. It is known as Green Part.

4 Debinding



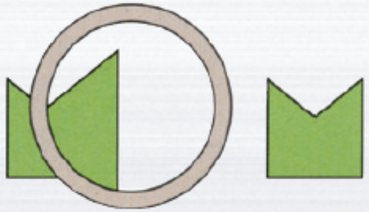
The binder is removed thermally from the green part.

5 Sintering



Fine metal particles are fused together by applying heat. High-density and precise parts are made.

6 Inspection

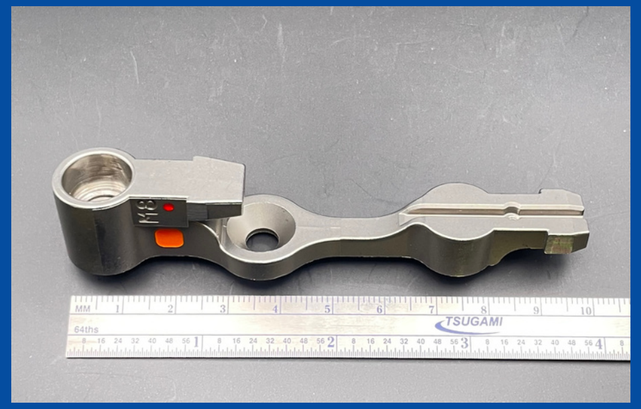


Inspection for mechanical properties to dimensional accuracy.

MIM Samples

Available Materials:

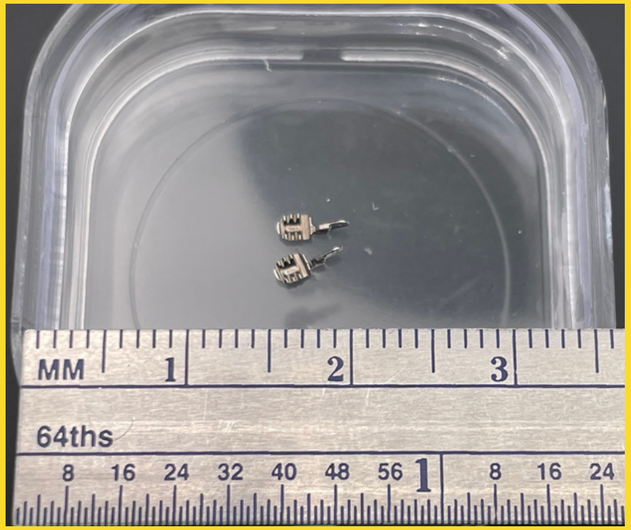
- Stainless Steel (304L, 316L, 630, 420, 440C, etc.)
- Titanium (CP-Ti, Ti-64)
- Alloy Steel (4340, 4115)
- Tool Steel
- Tungsten Carbide
- Iron/Nickel
- Iron/Silicon
- and more...



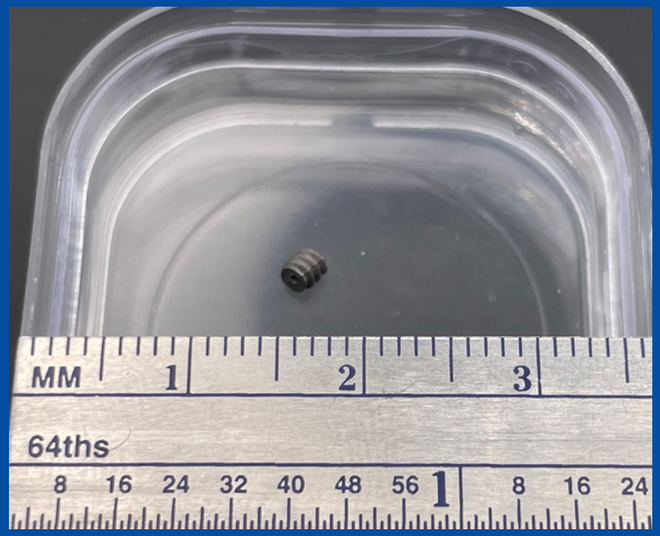
Stainless Steel 316L
Portable Digital X-Ray
Diagnostic Device, Bracket



Stainless Steel 316L
Dental Drill Head



Stainless Steel 17-4PH
Forceps

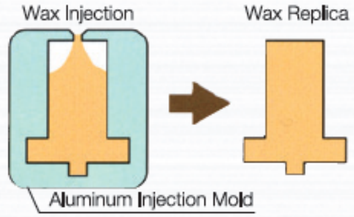


Porous CP-Ti
Dental Implant Screw

Investment Casting Process Overview

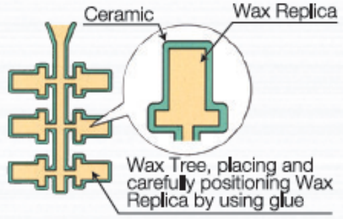
Investment Casting produces “near net shape,” thus saving material and rendering many machining operations superfluous. Some components can be combined into a single casting, thus avoiding extensive assembly or welding and high cost.

1 Creating Wax Replica



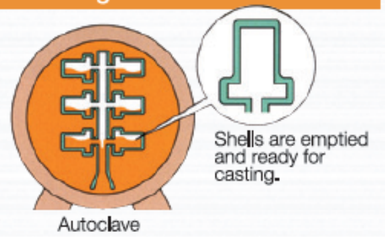
In-house tool department builds molds then wax replica is produced with injected wax.

2 Building Ceramic Shell



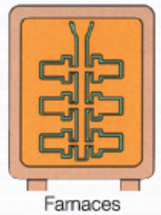
Wax Trees are coated with liquid slurries to build a multiple (4~6) layered ceramic shell.

3 Removing Wax



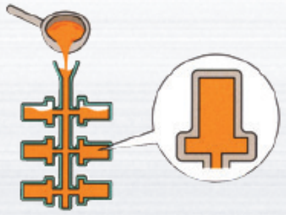
Wax is removed from shell by melting it in an autoclave where high pressure steam is injected with heat.

4 Preheating Shell



Preheat Shells in furnaces to burn left wax in the shells.

5 Casting



Shells are filled with molten metal.

6 Cutting



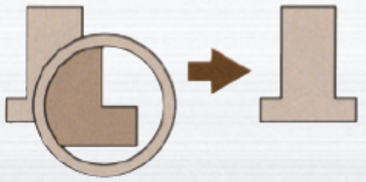
Casted parts are cut from the trees.

7 Heat Treatment



When casted parts are heat treated, material's properties improve, resulting in a better combination of ductility and durability.

8 Inspection



Inspection for mechanical properties to dimensional accuracy.

Investment Casting Samples

Available Materials:

- Stainless Steel (304, 316, 630, 440C etc.)
- Carbon Steel (1025, 1045, etc.)
- Alloy Steel (4140, etc.)
- Aluminum (356, 360, 514, 6061, etc.)
- Tool Steel
- Copper and Copper Alloys
- Iron (White Iron, Grey Iron, Ductile Iron)
- Super Alloys
- and more...



Stainless Steel 316
Electropolished
Pump Tube Connector



Ti-64
Prosthetic Leg Part



Ti-64
Prosthetic Knee Joint Part