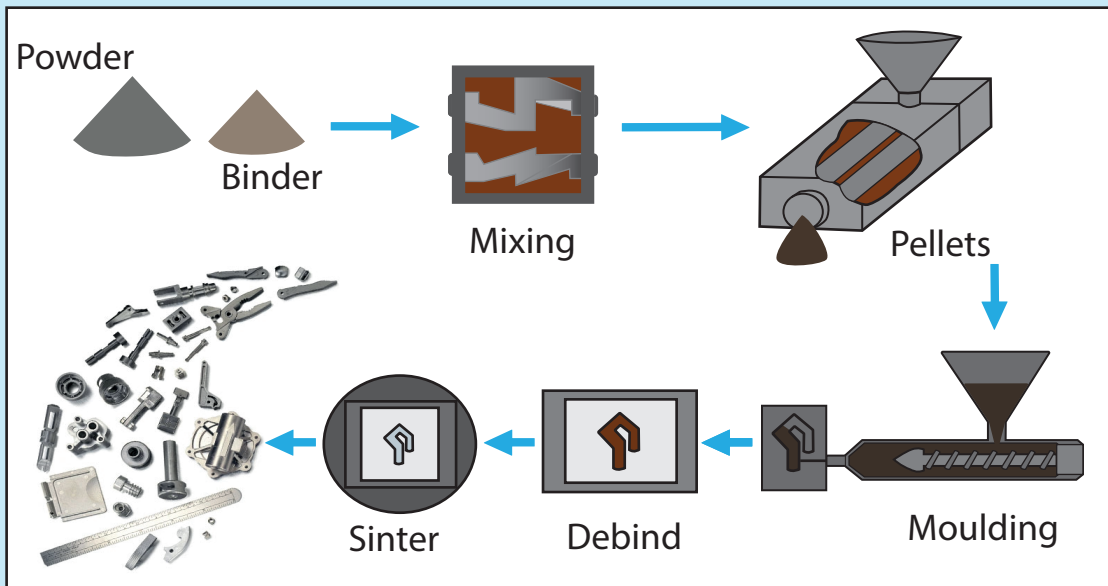


Metal Injection Moulding



Part Size and Design

The parts most commonly developed using MIM techniques are small and complex, as creating these with MIM will ensure to be more productive than other processes. The major advantage of MIM is being able to produce a large quantity of intricate parts, therefore it would be in the designer's best interest to make the most of this manufacturing process by utilising this advantage.

Costs

To make MIM cost effective, it is important to produce at least more than 10,000 units to make back the money spent. One advantage of MIM is that it is cheaper to develop small, complex parts than other processes. It is not uncommon for MIM to cost 50 percent less than CNC machining or investment casting.

Volume and Speed of Production

The volume of production for Metal injection Moulding involves both large scale and small scale, with different companies producing different scales respectively. The most common usage of MIM is for making large quantities of small parts where it would be too expensive to do with machining. The speed of this process is relatively fast, about the same speed as plastic injection moulding. However, removing the binder and sintering add additional time to the process.

Post-Processing

One of MIM's advantages is that the parts come out with very good detail and surface finish, therefore not requiring much work once it is out of the process. However, if the part or parts do not have a good finish then the issues can be taken out by conventional means such as grinding, burnishing and lapping.

Synopsis of Process

MIM is a type of injection moulding that utilises metals instead of plastics, to make highly detailed moulds that would otherwise not be achievable by other processes. Metals involved include Stainless Steel, Tool Steel, Tungsten Alloys, Titanium Alloys and nickel. MIM can produce both large and small quantities of parts as long as they are of small size. However, MIM is most cost effective when the amount of intricate parts is greater than a certain value for that part to be made with machining techniques.

Materials used in Process

Tool Steel

Tool steel is a material used for creating tools, hence its name, as its properties contain high hardness and abrasion resistance. Tool Steels are a variety of carbon and steel based alloys that are usually used to form other metals.

Stainless Steel

Stainless steel is an alloy of iron, chromium, carbon, manganese and silicone. Steel can have nickel and molybdenum to increase its formability. This is helpful in MIM processes as it can aid the finish of the part.

Titanium

Titanium is an incredibly strong metal, but has lower density than Steels. Because of this, it is commonly found in use in alloys with aluminium, iron and molybdenum.

Nickel

Nickel is a widely used metal due to its strength and resistant to corrosion and heat. It is also ductile. It's also used with iron to make stainless steel.

Suppliers

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