



INTRODUCTION TO METAL INJECTION MOLDING (MIM)

Overview of Metal Injection Molding

Metal injection molding (MIM) is a manufacturing solution that uses the shaping advantage of the injection molding technology. MIM, using fine (<20 μm) metal powder, is capable of transforming complex concepts & designs into high precision, complex geometry net-shaped products from a wide range of materials such as carbon steels, low alloy steels, stainless steels, low expansion alloys (kovar and invar), tool steels, soft magnetic alloys, super alloys and non-ferrous materials like tungsten and copper.

MIM is ideal for the mass production of intricate engineering parts in medium to high volumes (over 10,000 parts annually). It is well suited for parts weighing from 0.05 gm to 250 gm. Wall thickness is typically about 0.7 mm (0.003 in). However, AMT has demonstrated the possibility of producing parts with 0.3 to 0.7mm wall thickness. Tolerances are on the order of ± 0.3 to 0.5%, albeit specific dimensions can be held as close as $\pm 0.1\%$.

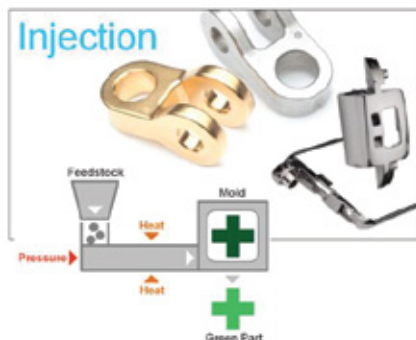
The Process

Mixing



Very fine metal powders are mixed with thermoplastic polymer (known as the binder) to form a homogeneous mixture of ingredients that is pelletized and directly fed into a injection molding machine. This pelletized powder-polymer mixture is known as feedstock.

Injection



In this process, the feedstock is heated to melt the binder content in order to form the desired component geometry. The molded part is known as the green part.
