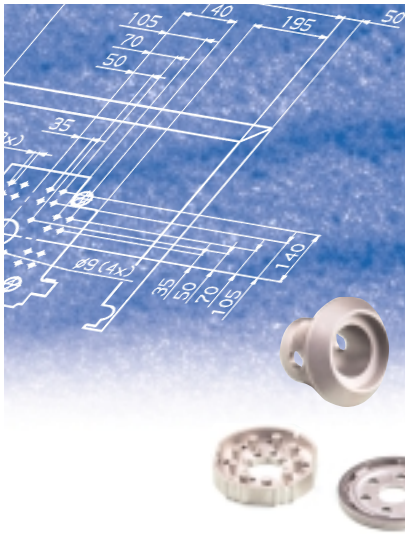


# PIM – Powder Injection Moulding

PIM



## Battenfeld – a leader in special applications

PIM is a process for the production of metallic or ceramic castings Which exploits benefits proved over the decades in injection moulding.

This means cost effective manufacture with:

- complex component geometries
- high output
- high levels of quality assurance
- fully automatic production

A characteristic of powder injection in contrast to mechanical manufacture of components is that additional complexity does not mean additional cost.



Thus the manufacture of highly integrated castings is possible – this contributes to the reduction of overall costs.

The increasing demands of complexity, output and quality together with reductions in unit cost can be fulfilled using this process, even when compared with lost wax casting.

Battenfeld Injection Moulding Technology offers an effective entry into PIM technology.

Working with effective Partners Battenfeld Injection Moulding Technology can supply everything from the PIM machine to the first production run.



Cutter

## Process and equipment

Process sequence:

In the first stage a feedstock is compounded from the powder and a binder system. The proportion of powder is usually at, or close to, the maximum possible: around 60% by volume. Parameters such as shrinkage can be influenced by altering the powder or binder.

Pre-formulated feedstocks are available on the market.

The second stage requires the aid of an injection moulding machine, similar to a thermoplastic injection moulding machine, to produce the "green" mouldings. Removal of the binder, usually thermally or chemically / catalytically yields the third stage, the so-called "brown" part.

The final product is made by sintering the "brown" component. There is around 15 to 20% shrinkage.



Blade in ceramic for cutting foil  
(manufactured by ECN)

An example of a plant comprising an injection moulding machine, removal robot and integrated quality control with a balance

## PIM machine equipment

The following machine kit is required because of the special properties of the feedstock used:

- special wear resistant materials for the screw and barrel.

The material chosen depends on the powder to be

processed. For hard metals and most ceramics the screw and barrel have to be in hard metal.

- special screw geometry
- high injection speeds for faithful reproduction of exact geometry

- temperature controlled feed throat
- special hopper
- SPC quality monitoring
- specific automation if required

