

## The Powdered Metal Process

Powdered Metal, or P/M, is a means of manufacturing metal parts by compressing and sintering various elemental or alloyed powders into a specific shape. The powders are blended, then compacted using a metal die and punches in a special hydraulic or mechanical press. These “green” parts, or briquettes, are then sintered in an atmospherically controlled furnace at high temperatures, causing the metal powder particles to bond together metallurgically. Most P/M parts range in size from miniature to 5 lbs. Production lots can range from a few hundred to several thousand per hour. Very little material is wasted in the P/M process, and shapes can range from a simple bronze bushing to a complex stainless steel part. Secondary operations such as coining or sizing, heat treatment, and infiltration using metals with lower melting points can enhance part density, dimensional control and strength. Of special interest is resin or oil impregnation, which adds lubricity to a P/M part. Many brass and bronze bushings are made using the P/M process for this reason. Gear shapes are also excellent candidates for the P/M process. P/M parts are easily machined after sintering, and accept plating and corrosion protection treatments well.

### Advantages of the Powdered Metal Process

- Tooling is relatively inexpensive
- Excellent means of producing parts with complex exterior curves or radii, projections and recesses. Square or tapered holes, key ways, flats and splines, which can not be easily machined can be achieved
- Excellent surface finishes and dimensional repeatability
- Wide selection of ferrous and non-ferrous materials available