

# SPM-PROCEDURES

## POWDER METALLURGY

SELECTING



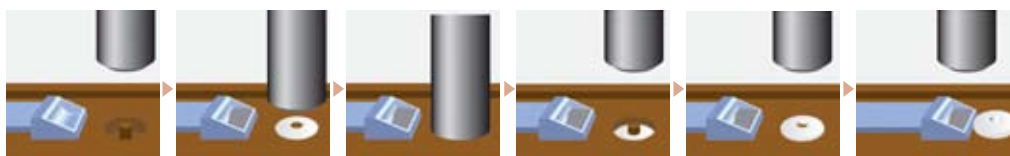
Select a type among Steel, Stainless steel, Copper powders according to mechanical properties of the final product.

MIXING



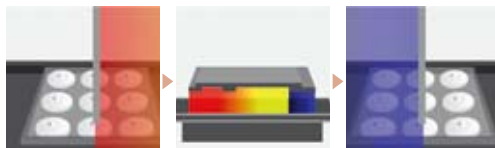
Mix sub-materials with a suggested range of ratios in order to obtain the certain mechanical properties.

COMPACTING



Compact the mixed metal powders with a certain pressure into the mold.

SINTERING



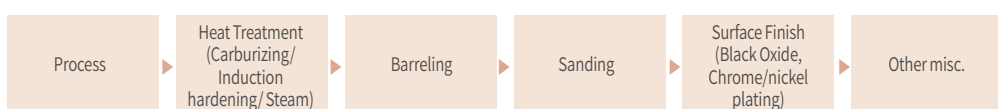
Sinter the compressed/compacted products at lower temperature than melting points so as to produce a product with the mechanical properties by diffusion and combination of metal powder particles.

SIZING



Compact again the output from the SINTERING step so as to increase the dimensional accuracy.

POST PROCESSING



INSPECTION

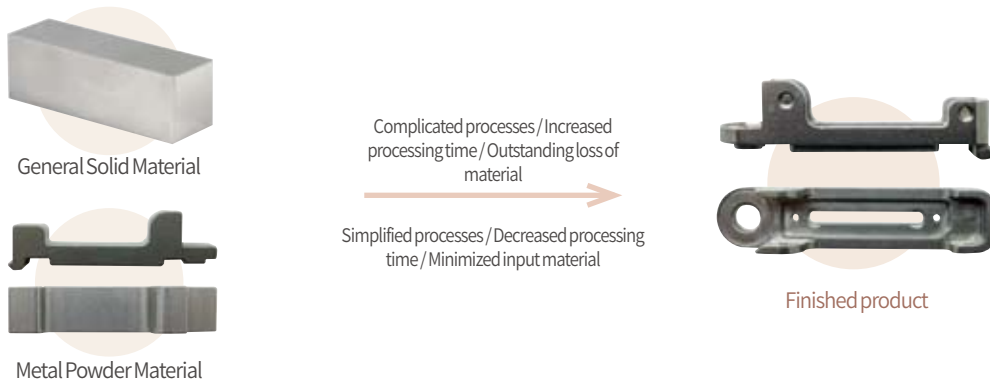
Implement an inspection to confirm whether the final output complies with customer's requirements. (material, shape, dimension, etc.)

# SPM-FEATURES

## POWDER METALLURGY

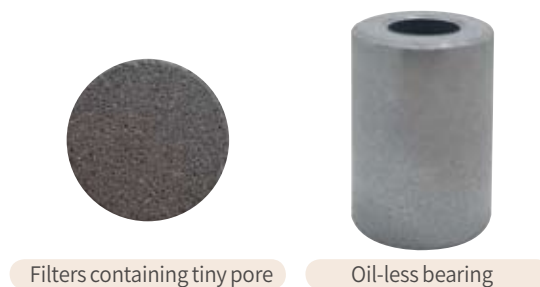
### Reduction of manufacturing cost

Minimized process steps & Decreasing loss of raw material.



### Available to make a part including tiny pores

Oil-less bearing / filters containing tiny pore can be manufactured.



### Enhancement on mechanical properties

SPM helps to enhance mechanical properties e.g. strength, stiffness, abrasion-resistance etc. through various heat treatment.

### Wide options of raw material

SPM has a wide options to select input raw material available. Moreover, alloy manufacturing is also available.

### Even quality

SPM allows to keep high dimensional accuracy.

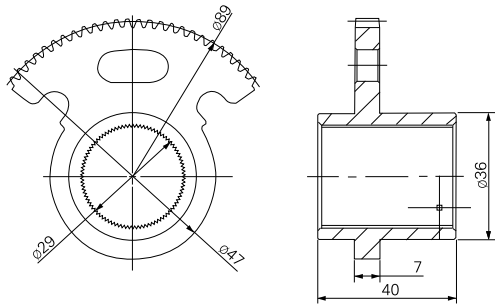
### Mass production

SPM is ideal for mass production.

# SPM-EXAMPLE APPLICATIONS

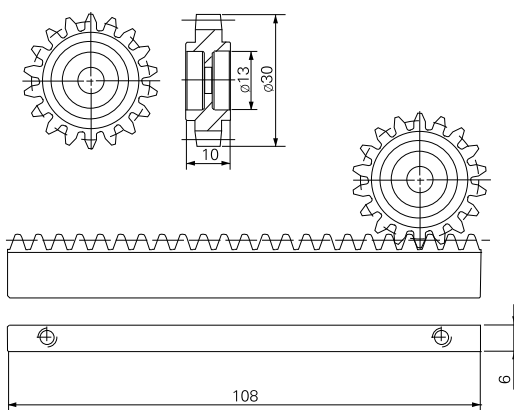
## POWDER METALLURGY

### Gear



Material	Fe(Iron) alloy powder
Mass	164 g
Density	7.0 g/cm <sup>3</sup>
Purpose	Air-conditioner parts (e.g. duct damper)

### Rack & Pinion Gear

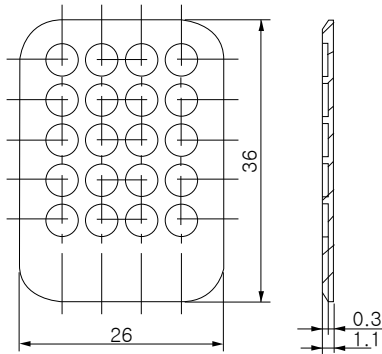


Material	STS 304
Mass	Rack : 47 g, Pinion 19 g
Density	6.8 g/cm <sup>3</sup>
Purpose	Linear motion in F.A. equipment

# SPM-EXAMPLE APPLICATIONS

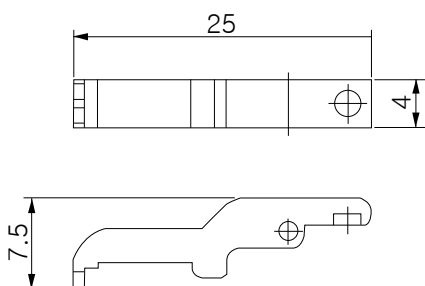
## POWDER METALLURGY

### Industrial Part I



Material	Fe(Iron) alloy powder
Mass	4 g
Density	6.8 g/cm <sup>3</sup>
Purpose	An extremely thin part of only 1.1mm thickness (Electric/electronic industry) made without a processing procedure

### Industrial Part II



Material	Fe(Iron) alloy powder
Mass	2.1 g
Density	6.8 g/cm <sup>3</sup>
Purpose	Complicated shaped part (for automation industry) made without a processing procedure