

Metal Bonding Technology P-Bas®

P-Bas, shorts for Pnch Bonding and sintering, is an innovative metal bonding technology. P-Bas enables the fabrication of mold components featuring cooling channels by bonding split parts.

TECHNOLOGY

1. Mold Components With Cooling Channels

P-Bas can bond materials without melting metal. Mold components featuring cooling channels are commonly produced using metal 3D printers. P-Bas can also fabricate mold components with cooling channels by bonding split parts.

2. Strong Joint Strength

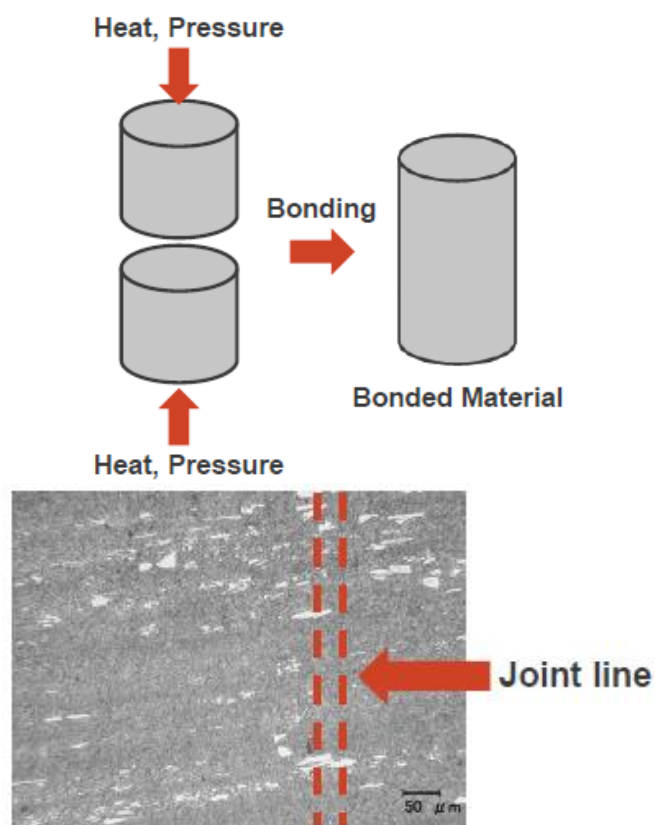
The strength of P-Bas products is stronger than that of metal 3D printed products. The strength of the joint is about 90% of other mold parts. We have optimized bonding conditions for popular plastic and die-casting mold materials such as SKD11, SKD61, STAVAX, and ELMAX

3. Preventing Rust of Cooling Channels inside P-Bas products

P-Bas products feature cooling channels with interior surfaces finer than those produced by 3D printing and the feature reduces the formation of rust in cooling channels. Surface coating can be applied to cooling channels inside P-Bas product.



Feature : Bonding materials without melting metal



- ▶ P-Bas enables the bonding of materials without melting metal.
- ▶ No joint marks are left on the bonded metal.

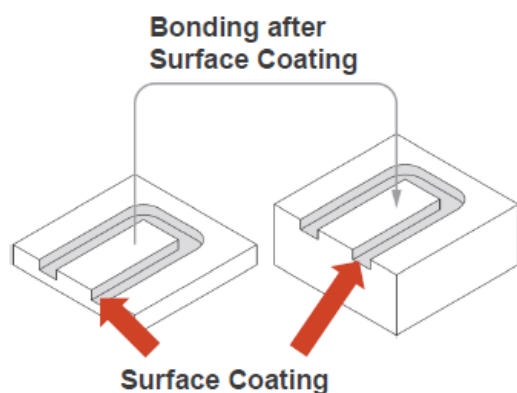
Rust prevention : Finer cooling channels and coating



Surface Roughness of Metal 3D Printer Product

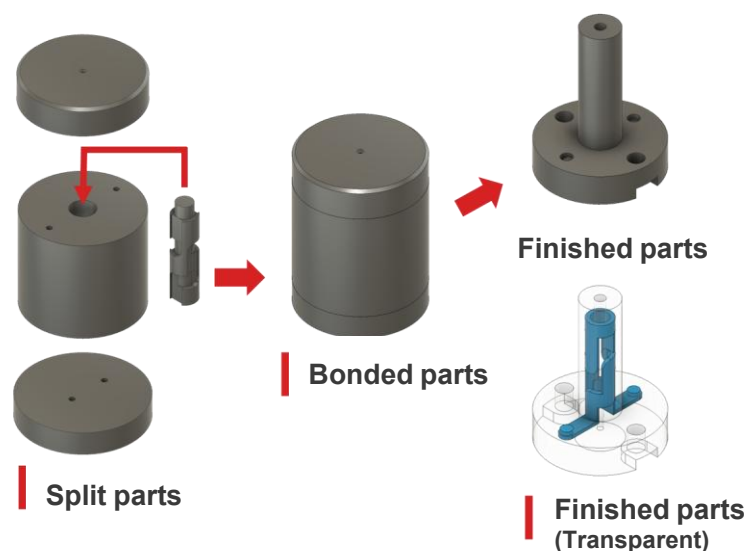


Surface Roughness of P-Bas Product



- ▶ The surface of cooling channels inside P-Bas products is finer than the surface of the 3D printed channels.
- ▶ Surface coating can be applied to cooling channels inside P-Bas products.

Example : Mold components with cooling channels



- ▶ Item : Mold Component for Plastic Bottles
- ▶ Material : STAVAX
- ▶ Size : $\phi 40 \times L50$
- ▶ This product has a spiral cooling channel inside. We fabricated this component by placing a spiral grooved part inside a cylinder.

Strength : 90% guarantee compared to its base material

Material	Strength
SKD11	101%
STAVAX	91%
ELMAX	95%
SKD61	98%
SKH51	92%
HPM38	100%
SUS420J2	100%
SUS440C	94%

- ▶ P-Bas is capable of bonding nearly all iron based materials.
- ▶ P-Bas guarantees that bonded materials will retain at least 90% of the base material's strength.