

## Hot Isostatic Presses HIP

The hot isostatic pressing process is a sintering process which takes place under a high pressure. The combination of high temperature and pressure leads to a 100% densification of the material, thereby achieving a material without any defects in the crystalline structure. The process is used amongst other things for parts and semi-finished parts which have been fabricated of metal powders with the Near-Net-Shape technique or using the container method.

A further large application field is the post-compression of parts from the following fields:

- AM Additive Manufacturing, e.g. SLS (Selective Laser Sintering)
- MIM Metal Injection Molding
- CIM Ceramic Injection Molding
- Cast and forged parts for the removal of defects such as cracks, tears, pores and cavities

Our portfolio consists of multi-functional high performance laboratory units as well as product orientated and optimized production plants.

### Specifications

| Technical Features |  |
|--------------------|--|
| Heating:           | Electric (Graphite basis, Molybdenum basis, Iron-Chrome und Nickel-Chrome basis) |
| Atmosphere:        | Argon, Nitrogen, active gas (at a pressure of up to 3000 bar)                    |
| Temperatures:      | up to 2000°C   |

### Application fields

First of all, HIP is used on parts which require very high standards regarding density, fatigue strength or polishability. These parts can be found in the medical, automotive, aerospace and jewelry industry.

Secondly HIP is added to production processes if the primary process doesn't achieve the required minimum standards. E.g. in the field of additive manufacturing of metal parts, the material structure quality is often rather poor. Here HIP can enhance the quality of AM parts to the known quality of established production processes such as casting, forging and CNC machining.

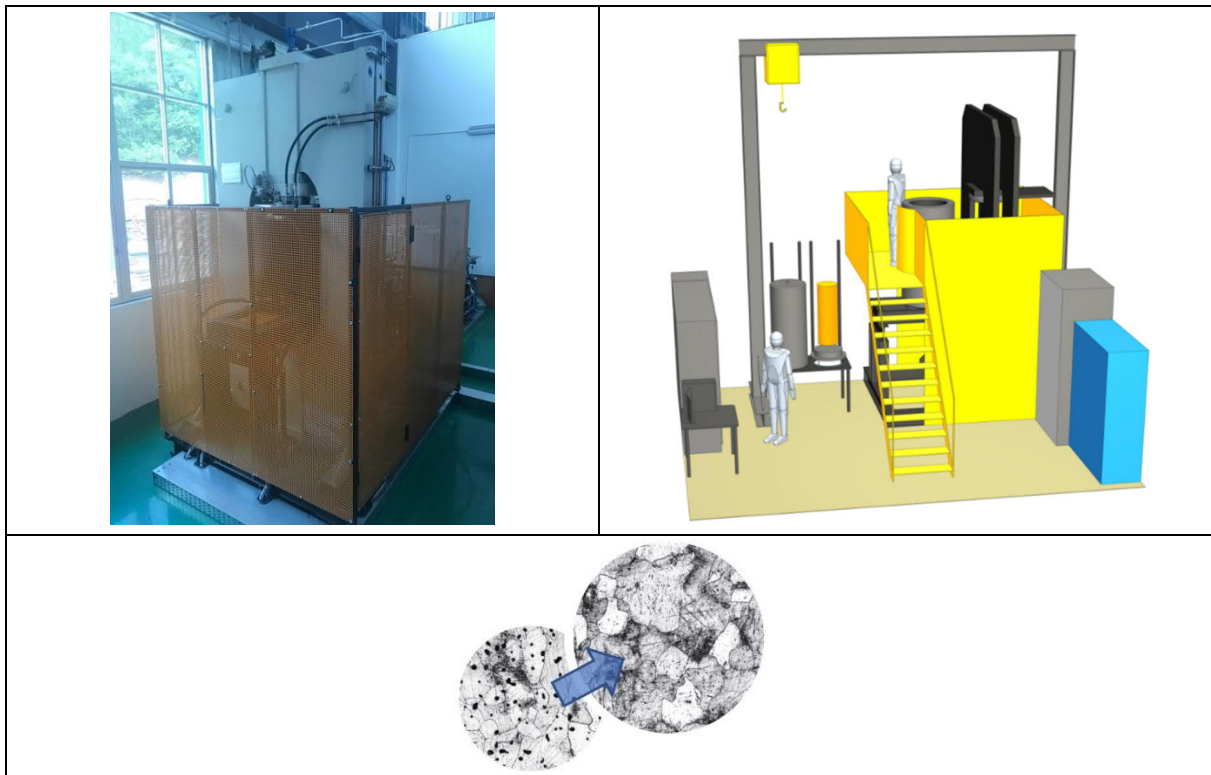
Finally, HIP is used when special powder material compositions (ceramic or metal) simply cannot be formed or combined by conventional production methods. This can be the case when e.g. the basic material is too hard or brittle to be forged or when casting will create unwanted crystalline phases. Combining unsolvable materials, such as brass and steel, is also nearly impossible using conventional processes.

In such cases, sintering with simultaneous diffusion, forced by sintering temperatures and high pressure during hot isostatic pressing, opens up completely new opportunities.

### Additional equipment modules

|  |  |
|--|--|
| + Rapid cooling  | + Capsule workshop / HIP tooling                                   |
| + Various types of furnaces are available for the HIP plant (Molybdenum, Graphite or Iron-Chromium furnace type) | + HMI-TPC 4.0 (Human Machine Interface, Total Process Control 4.0) |
| + Crane for batch loading and unloading  | + Automation   |

### Gallery



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