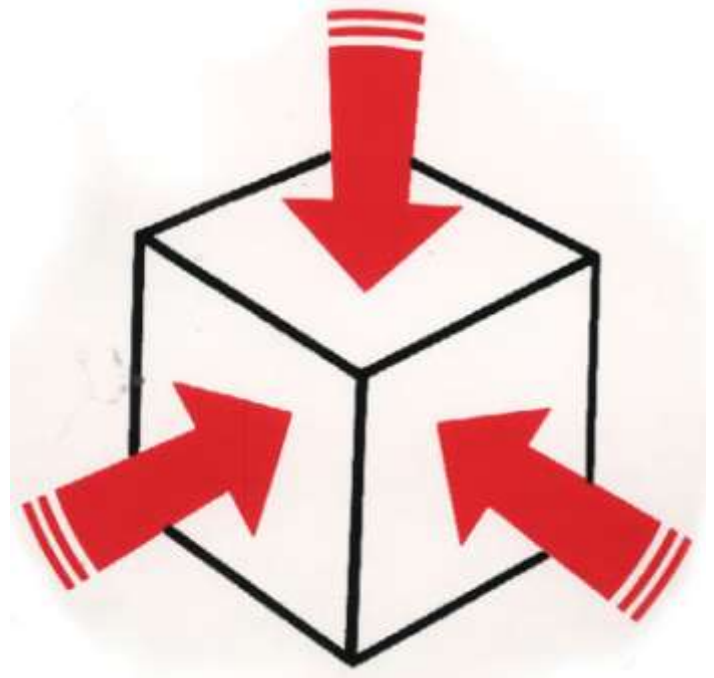


A technical drawing showing a cross-section of a hot isostatic pressing (HIP) process. It depicts a cylindrical workpiece being pressed from all sides by a fluid medium (gas or liquid) contained within a pressure vessel. The drawing includes various hatching patterns to represent different materials and components, such as the workpiece, the fluid medium, and the pressure vessel walls. The text "Hot Isostatic Pressing" is overlaid on the drawing in a blue font.

Hot Isostatic Pressing

THE MEANING OF HIP

- **HOT** - 500°C to 2000°C
- **ISOSTATIC** - Pascals Law: In a fluid, pressure is transmitted equally in all directions. Fluid used: Argon
- **PRESSING** - 1,000/2,000 bar (Greater than Mariana Trench - 11,000m deep in Pacific Ocean)



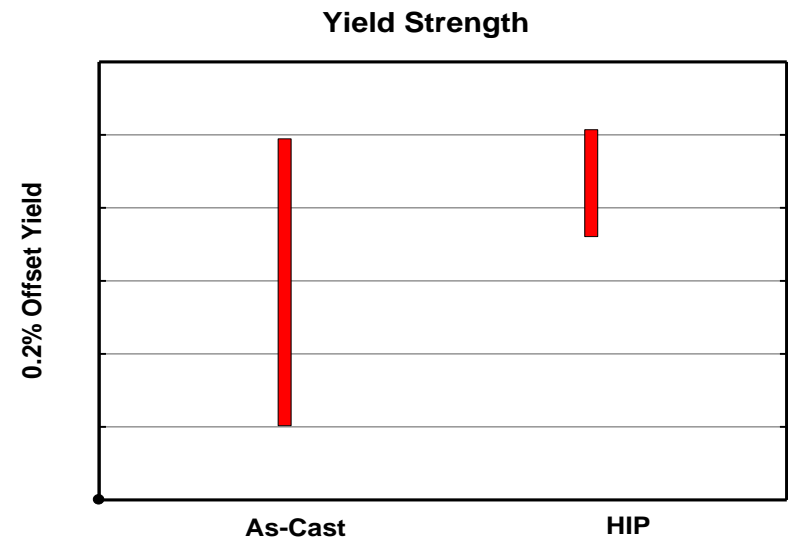
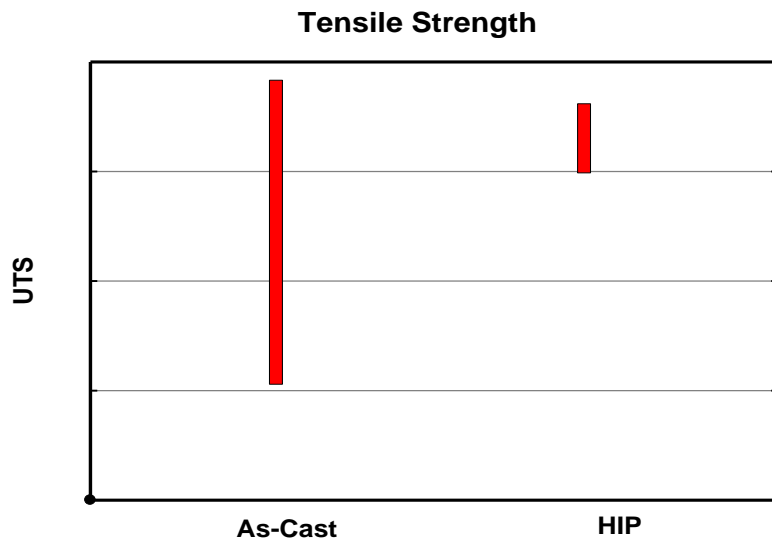
Primary Benefit of HIP

Improvement of mechanical properties of cast materials and powder-metal-formed components

Elimination of residual porosity typically improves fatigue strength, ductility and impact toughness in metals.

Cladding allows expensive material to be applied to critical areas of components

Variation in ultimate tensile strength and yield strength before and after HIP, for typical nickel-base superalloys.



Commercial Castings

- Turbocharger wheels
- Pump bodies
- valve components
- gun parts
- sterile enclosures
- high vacuum materials
- Al, Ti, Steels, SS's
- Critical parts and leak - tight surfaces



HIP P/M Manifold Segments

