



Inert gas hardening

Process description:

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Inert gas hardening is a complete hardening process during which components are protected within a reactive atmosphere against negative impacts of the edge zone (e.g. decarburisation). During inert gas hardening, an oil bath is used for quenching purposes. This method is also applied to completely harden unalloyed and low-alloy steels. With a subsequent tempering treatment, changes in characteristics (strength, toughness, wear resistance, etc.) within a broad range can be achieved.

This is used in the following sectors:

→ Tool manufacturing and mechanical engineering, bearing industry, agricultural machinery, hydraulics, etc.

Materials:

→ Unalloyed and low-alloy tool steels

Key characteristics:

→ Exact process control
(thermocouples, mass flow controller, quenching medium, etc.)
→ Process parameters adapted to materials

Surface hardness:

→ A test of the tensile strength (R_m) is not possible at RUBIG; only the surface hardness is tested and this is converted to tensile strength pursuant to the standard.

Usable furnace area:

→ 1,050 × 690 × 700 mm (L x W x H)

Maximum batch weight:

→ 1,100 kg gross weight

Cycle duration:

→ On request

What are the most common applications of this process:

→ Adjustment of strength and toughness properties
→ Increase in hardness



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Necessary information:

- Material specifications
- Required hardness
- Subsequent processing steps (e.g. nitriding, coating, burnishing)
- Deformation check or the maximum permissible distortion

Make sure parts are in a suitable condition before delivery:

- Component should be free from grease, oils, processing aids or drawing and casting marks
- Preferably avoid sharp edges and/or large cross-sections

Important:

- Attention! Unalloyed tool steels, so-called case hardening steels (e.g. C45), are difficult to harden in oil.
- The hardness strongly depends on the component geometry!
- Dimensional changes must be taken into consideration - please note that parts are processed with corresponding allowances.
- Straightening is very difficult with materials, because it increases the risk of breakage and cracking.

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