

Vacuum Heat Treatments

Description

Vacuum heat treatments are carried out in high-technology furnaces operating under vacuum, therefore in an oxygen-free atmosphere.

This process allows the achievement of **optimal mechanical properties** — such as hardness, strength, and dimensional stability — avoiding oxidation and surface contamination, ensuring an **extremely clean treatment** for both the product itself and the environment.

Treatment quality is guaranteed by **accurate control of temperature, time, and pressure parameters**, and by the use of **fully automated plants** operating **24 hours a day**. For each batch, Eurolls provides **certificates of conformity** including thermal cycles, micrographic analyses, and hardness measurements.



Process

The component is heated in a vacuum chamber up to the treatment temperature, held for a defined time, and subsequently cooled in a controlled manner by means of high-pressure inert gas (nitrogen or argon).

This cycle allows uniform temperature distribution and rapid, clean cooling, **ideal for precision components or high-alloy steels**. Eurolls is able to design **dedicated cycles** according to customer requirements.

Highlights

- No surface oxidation or decarburization
- High dimensional stability and hardness uniformity
- Improved resistance to wear and thermal fatigue
- Clean material, free from residues and contamination
- Ideal as a pre-treatment for PVD coatings, Thermal Spray, and laser cladding overlays

Applications

- Rolls and tools in cold- and hot-working steels
- Blades and components for cutting lines
- Dies, punches, and mold inserts
- Precision mechanical components
- Components subject to thermal stress and wear

Heat Treatment	Technology	Materials
Hardening and Tempering	Vacuum	Tool steels High-speed steels
Tempering	Vacuum Controlled atmosphere	Tool steels High-speed steels
Low Annealing	Vacuum	Tool steels High-speed steels
Annealing Stress Relieving	Controlled atmosphere	Tool steels High-speed steels Structural steels
Cryogenic Treatment		Tool steels High-speed steels

Technical Data

- Maximum load dimensions line 1: 900 × 1200 × 600 (h) mm
- Maximum load weight: 2000 kg
- Maximum load dimensions line 2: 1500 × 1500 × 1500 (h) mm
- Maximum load weight: 5000 kg

Number of Furnaces

- 4 vacuum hardening furnaces
- 9 tempering furnaces
- 1 unit for cryogenic treatment



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