Nitriding Technology

Plasma-nitriding
Our division **plasma-nitriding** carries out the following heat treatments:

- Plasma-nitriding
- Improx®-oxidation
- Nitriding suitable for UniTwin®-coating

To the fore at **H-O-T** are high-quality steels:
- Tool steels  
  - Cold-work steels  
  - Hot-work steels  
  - Plastic mould steels  
- Heat-treated steels  
- Case-hardening steels  
- Corrosion-resistant steels  
- High-speed steels  
- Powder-metallurgical steels

Having worked in steel treatment for decades and by consistently cooperating with renowned steel producers, **H-O-T** is able to guarantee maximum customer satisfaction on highest level.
We have satisfied customers in the:

- Engineering industry
- Gear industry
- Device engineering
- Plastics processing moulds and melting section units
- Aluminium forming pressure casting dies, extrusion dies
- Cold-forming tools
- Sintering press tools
- Paper manufacturing and recycling

The advantages of plasma-nitriding are:

- Clean and environmentally-friendly process e.g. there are no harmful residues and substances
- High flexibility of the process
- High grade of automation
- No porous zone in the compound layer
- The results of the process are very good reproducible
- Determination of the layer structure
- Less roughing of the surface
- Possibility of using low process temperatures (below the tempering temperature)
- Optimized dimensional stability
- Easy removing of passivated surface layers on high chromium-alloyed steels by sputtering (surface activating)
- Possibility of partial nitriding
Further advantages of \textit{plasma-nitriding technique} are:

- Increase of resistance against abrasive wear
- Decrease of adhesion
- Improvement of removing parts from the mould
- Improvement of the corrosion resistance of unalloyed and low-alloyed steels
Tips for **plasma-nitriding technique:**

- If cooling bores are closed with copper plugs, plasma-nitriding is partly possible.
- Please use brazing filler metal only with melting temperatures above 800°C.
- Already at an angle of < 90° the edges are bulging.
- The tools and components should be metallic-shining and free of oxidation and corrosion.
- The bores must be free from lubrication and cooling liquids, lacquers or plastic residue.
- For the partial nitriding please attach a drawing where you please indicate, which parts have to be nitrided.
- In your order you should mention the tensile strength and the lowest tempering temperature.
- Please indicate the exact description of the material and the requested nitride case depth.

![Plasma-nitriding technique tips](image)
We offer our customers the following special treatment processes:

- Improx®- oxidation*
- Plasma-nitriding suitable for UniTwin®- coating
- Partial plasma-nitriding

* Improx®- oxidation is a process which will first plasma-nitride the surface to achieve a special compound layer.

Afterwards a thin film consisting mainly of Fe₃O₄ (magnetite) will be deposited on this layer.

This magnetite is a dark blue to black oxide with a very high corrosion resistance, that does not react with most of the chemical elements.
We guarantee your success - not only through our daily achievements in hardening and surface technology, but also through our wide range of services:

Following tests can be effected at our own, state-of-the-art laboratories:

- Material analysis
- Microstructure analysis
- Damage analysis
- Nht (nitride case depth) measurement
- Case-hardening thickness measurement
- Hardness testing
  - acc. to Rockwell HRC
  - acc. to Vickers HV
  - acc. to Brinell HB
- Crack detection
  - with die penetration
  - with flux

Delivery notes should always indicate whether heat treatment suitable for PVD-coating or eroding is required. This will enable us to ensure optimum heat treatment for your tools.
### Hardening technology

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### Service

- Laboratory (analyses, sample tests)
- Consulting (materials, layouts)
- Pick-up-service (with own fleet)