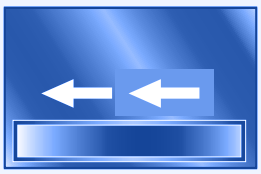
Nitriding / Nitrocarburising

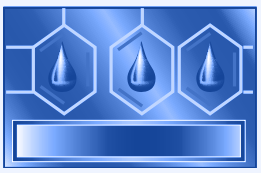
Surface hardening of steel in gas/plasma

High wear resistance

High surface hardness

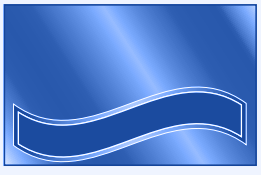


Reduction of the friction coefficient

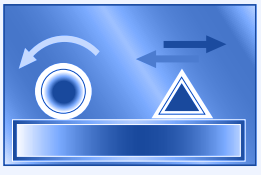


Improved corrosion resistance

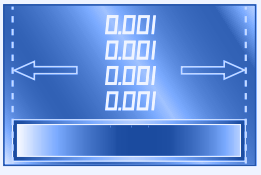
Improved heat resistance



Increased fatigue strength



High resistance to abrasion



Good dimensional and shape accuracy

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Nitriding / Nitrocarburising

Surface hardening of steel in gas/plasma

What is Nitriding / Nitrocarburising?

These processes are low-temperature and low-distortion "thermochemical" heat treatments carried out to enhance the surface properties of finished or near-finished ferrous components.
The processes are different in terms of materials suitable, processing conditions, the nature of the surface layers imparted, and the property improvements conferred.

Nitriding

This process is conducted in gas (490-560 ºC), or plasma (400-590 ºC) for treatment times ranging up to (nominally) 100 hours, and involves the diffusion of nitrogen into the surface to produce a controlled depth of hard alloy-nitrides. Unlike high temperature case hardening treatments, hardening is achieved without the need for quenching.

Nitrocarburising.

The process of Nitrocarburising is of shorter duration (30 minutes to 6 hours) and involves enrichment of the surface with both nitrogen and carbon to impart a thin iron carbonitride "compound layer" supported by a nitrogen bearing "diffusion zone".

Nitrocarburising is conducted at temperatures between 560-720ºC, may be completed by quenching, and can involve additional steps (oxidising for example) to promote certain required properties.

Nitriding Applications

Nitriding is favoured for components that are subject to heavy loading, the high surface hardness promotes resistance to wear, scuffing, galling and seizure.

Typical applications include gears, crankshafts, camshafts, cam followers, valve parts and tooling.

Nitrocarburising Applications

The resultant compound layer developed in Nitrocarburising is a good lubricant retaining surface, and is responsible for the major benefits of high resistance to wear scuffing, galling and seizure. The diffusion zone contributes to enhanced fatigue resistance, when components are quenched.
An increased corrosion resistance can be improved upon further by post-oxidation treatment.

Typical applications include pressings, bearing shafts and cages, cams and crankshafts, bushes, liners, pump components and tooling.

Materials

Nitriding is most effecive for engineering components when applied to the range of steels containing nitride forming elements such as chromium, molybdenum, vanadium and aluminium.

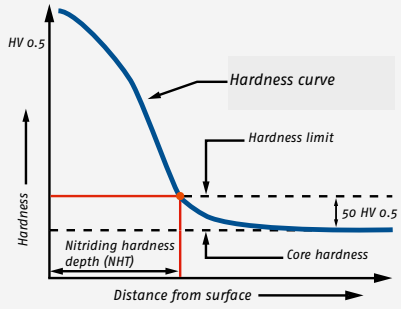
Stainless steels, tool steels and some cast irons can also be Nitrided.

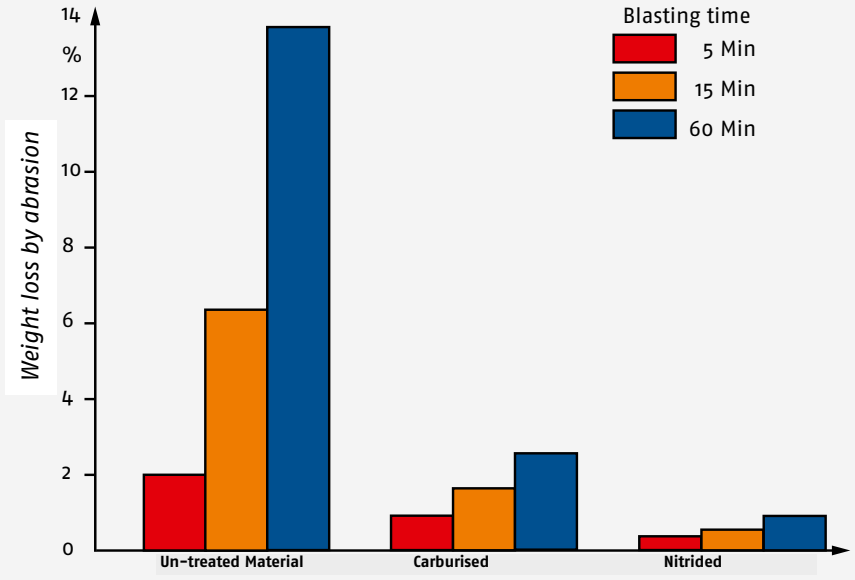
Nitrocarburising can be applied to most ferrous materials. It is used to upgrade the properties of components made entirely from inexpensive and easy to manipulate, low to medium carbon non-alloy steels.

Hauck HT offer extensive capacity in all variants of Nitriding and Nitrocarburising, at multiple locations, under Aerospace, Automotive and Commercial approvals.

Properties

- High resistance to abrasion
- High surface hardness
- Lower friction coefficient
- Improved corrosion resistance
- Improved heat resistance to about 500 °C
- Increased fatigue strength
- Good size and shape accuracy





Weight loss on a tested sample of Heat & Surface Treatment B.V.