NITREX

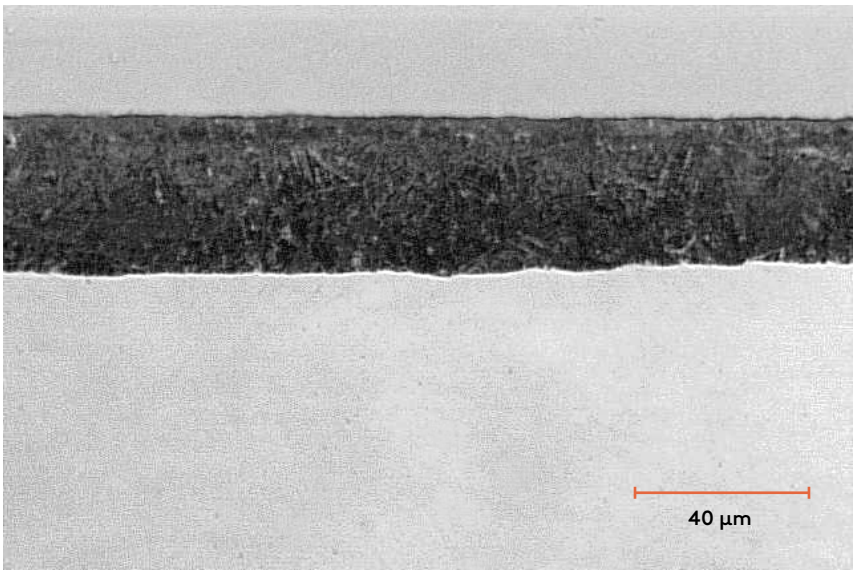
NITREG®-S

AMS 2759/12 COMPLIANT

WHAT IS NITREG®-S

Stainless steels respond to gas nitriding differently than other ferrous alloys, and there are also significant differences within stainless and nickel alloy groups as well.

The primary reason for this is that depending on the chemistry of the steel it will behave differently with respect to the kinetics of layer formation, and it is a rather difficult process to control. In other words, unless you have the experience and tools for stainless nitriding, you may end up with nothing, or too little, or too much case depth or white layer, or even damaged parts.

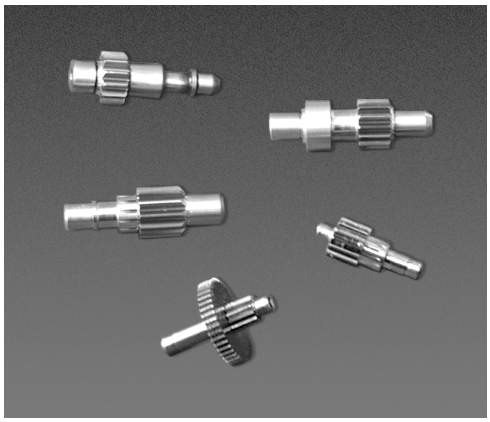


Microstructure of AISI 304 Stainless Steel with 0 µm White Layer

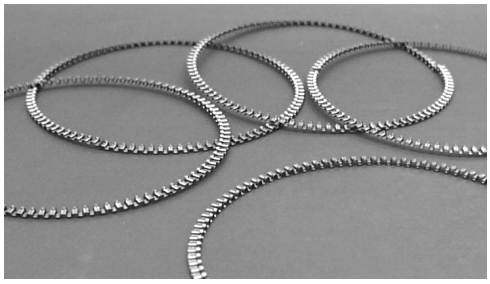
NITREG® S

IS A PROCESS IN WHICH ANY STAINLESS STEEL MAY BE SURFACE HARDENED, WITH COMPLETE CONTROL OVER THE FORMATION OF NITRIDED LAYERS.

Eco-friendly technology



Pitch Gears, made of 17-4PH, 13-8Mo, 15-5PH and 416 steels



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NITREG®-S ADVANTAGE

- Attains excellent wear resistance
- Improves fatigue strength
- Prevents galling
- Does not alter chemical composition of alloy
- Has no effect on the steel's non-magnetic nature composition of alloy
- No change in the color, shape or size
- Uniformly hardened even small bores, tight grooves and sharp edges
- Green technology, no waste pollution

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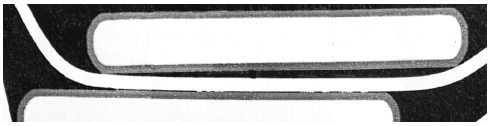
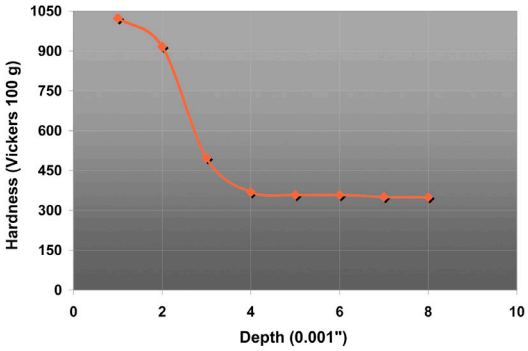
HOW IS IT CONTROLLED?

With NITREG®-S the following aspects of the process are controlled:

- Diffusion is the same as in any other well run, high quality nitriding process – it is a function of temperature and time in a suitable atmosphere
- Ability to produce a diffusion case with zero white layer, or a layer of specific thickness
- The process is controlled primarily through:
  - Proper sequence of stages
  - Gas mixtures in individual stages of the process
  - Temperatures
  - Nitriding potential control, in order to control the white layer formation



Cross Section of Nitrided Piston Ring



Hardness Profile of Nitrided 17-4PH Pitch Gear

RESULTS

The most significant characteristic of the NITREG® family of nitriding technologies is our ability to control the development of the diffusion case separately from the compound (white) layer.

Some find it hard to believe, but we are able to produce any case depth combined with any white layer thickness, within the ranges described below. In nitriding of stainless steel it is extremely important to understand the risks in specifying a deep case or a thick compound layer. Stainless steels develop extremely hard nitrided layers, due to their alloy content, primarily chromium. Therefore a reasonable specification will rarely exceed a 0.006" (150 µm) case, and the white layer should generally be within the zero to 0.0004" (10 µm) range. Should these be exceeded, there is risk of damage due to the layer's inherent brittleness.

Users must also understand that nitriding may produce some loss of corrosion resistance. We have developed methods of minimizing the effect, an important issue in certain applications.

TREATABLE MATERIALS

- 303, 310, 316
- 422
- 17-4PH, 15-5PH
- 13-8Mo
- A286
- High Nickel Alloys
- Inquire about other materials

TYPICAL APPLICATIONS

- Actuator Components
- Gears, Gear-shafts
- Latches, Levers, Locks
- Pins, Plates
- Racks and Pinions
- Valve Stems
- And Many Others

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