NITREX

NITREG®-C NITROCARBURIZING

WHAT IS NITREG®-C

NITREG®-C is a nitrocarburizing process based on the proven NITREG® potential-controlled gas nitriding technology. It incorporates the simultaneous diffusion of carbon and nitrogen into the steel surface.

NITREG®-C is often specified in industrial applications on the merit of its being an environmentally friendly but equivalent alternative to salt bath nitrocarburizing. NITREG®-C conducted in gas atmospheres can be considered a process complementary to NITREG® gas nitriding.

The purpose of the treatment is to create a hardened superficial layer, enhancing wear and corrosion resistance, or improved fatigue resistance of treated steel or cast iron parts, without distortion of shape or dimensional changes.

TYPICAL APPLICATIONS

Whenever your nitriding specification calls for a higher ε (Epsilon) content, NITREG®-C is the sure answer. Synchro cones, shown in the adjacent photograph, manufactured from a low carbon micro alloyed steel, constitute an application where the major requirement was to have more than 80% of the ε-phase present in the white layer. Results of X-ray diffraction tests showed the ε content to be 97-98%.

It is generally recognized that the ε-phase of the white layer features better wear resistance than the γ' (gamma prime) layer. For this reason, engineering drawings sometimes require specified contents of the ε phase in the white layer. Consequently, stabilization of ε through NITREG®-C should be viewed as a positive effect.

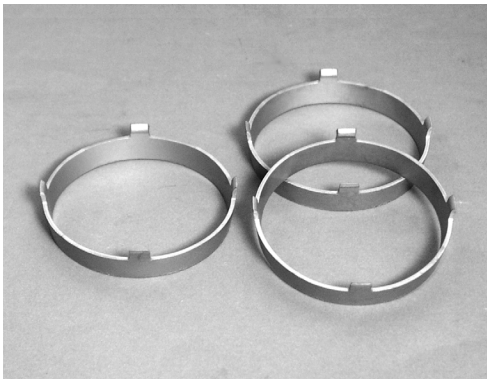
NITREG® C

LOWERS PRODUCTION COSTS AND IMPROVES THE WEAR RESISTANCE OF TREATED PARTS WITHOUT DISTORTING ITS SHAPE OR DIMENSIONS.

AMS 2759/12 COMPLIANT

Whenever your specification calls for Ferritic Nitrocarburizing, NITREG®-C meets all requirements with full control & repeatability.

Eco-friendly technology



Synchro rings (micro alloyed steel) treated with NITREG®-C

NITREG®-C ADVANTAGE

- NITREG®-C accelerates formation of the compound (white) layer on low-carbon unalloyed steel
- NITREG®-C features low operational costs by utilizing more economic gas compositions
- NITREG®-C increases and stabilizes the ε-phase content in most types of steels

CANADA/USA
+1 514 335 7191
nitrex@nitrex.com

POLAND
+48 32 296 66 30
nitrex.europe@nitrex.com

CHINA
+86 (0) 10 6257 3050
nitrex.china@nitrex.com

NITREX
nitrex.com

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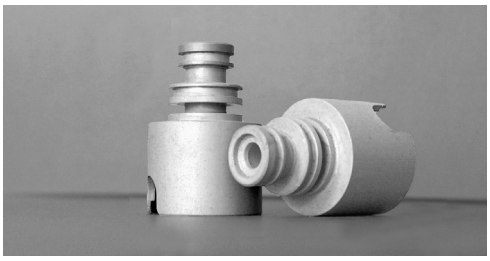
TYPICAL APPLICATIONS

Housings manufactured from 12B10 grade free machining steel required a consistent and uniform white layer of 25 µm (0.0010") on the entire surface.

Uniform nitriding of this part proved to be difficult, due to a surface condition caused by machining. The NITREG®-C process was capable of producing results meeting all specification requirements with excellent uniformity.



Housings (12B10 free machining steel) treated with NITREG®-C

HARDNESS & CORROSION RESISTANCE

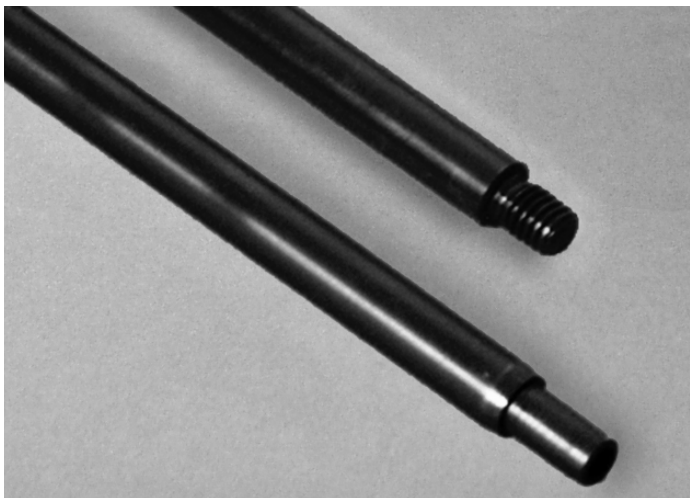
For those applications where high ε–content, excellent wear resistance and enhanced corrosion resistance are simultaneously required, a combination of NITREG®-C and post-oxidation as in ONC® is the winning solution.

Specifications for gas spring rods made of 1040 steel required a surface hardness of over 400 HV and a corrosion resistance measured by a minimum of 144 hours in salt-spray per ASTM B117.

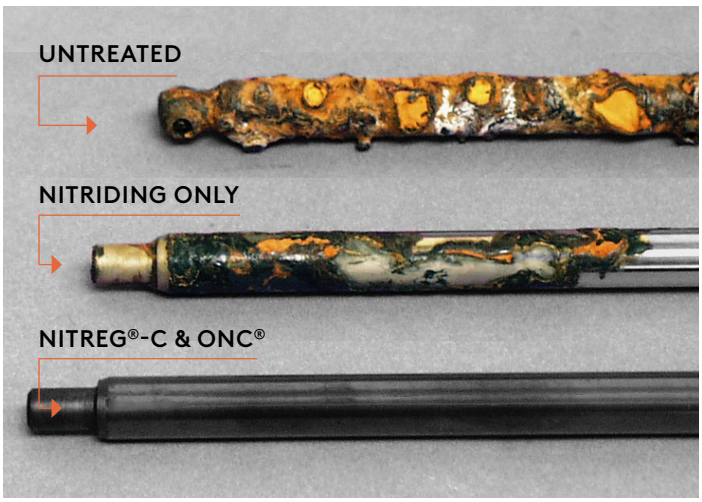
Combination treatment of NITREG®-C and ONC® resulted in a surface hardness of 590 HV, 400 hours in salt-spray to first corrosion spot as per ASTM B117.

Because it is conducted as a fully carbon and nitrogen controlled process, NITREG®-C, with its pronounced effect in promoting the ε-phase in the compound layer can bring significant advantages in specific applications.

Gas spring rods treated by NITREG®–C and ONC®



Appearance after 560 hrs in salt spray as per ASTM B117



CANADA/USA
+1 514 335 7191
nitrex@nitrex.com

POLAND
+48 32 296 66 30
nitrex.europe@nitrex.com

CHINA
+86 (0) 10 6257 3050
nitrex.china@nitrex.com

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nitrex.com