Whenever your specification calls for nitrocarburizing, Nitreg®-C meets all requirements with full control and repeatability.

**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.

Nitreg®-C lowers production costs and improves the wear resistance of treated parts without distorting its shape or dimensions.

**Nitreg®-C ADVANTAGE**

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

**Typical Applications**

Whenever your nitriding specification calls for a higher ε 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 features better wear resistance than γ'. 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.
TYPICAL APPLICATIONS

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.

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.

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 controlled process, NITREG®-C, with its pronounced effect in promoting the ε-phase in the compound layer can bring significant advantages in specific applications.

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.