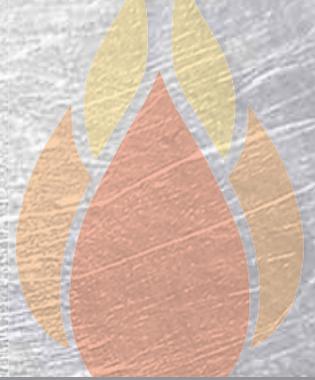




Heat Treatments

QUALITY • SERVICE • EXPERTISE



Nitreg® + ONC® (“black nitriding”) HTL Fact Sheet 17

Very hard, corrosion resistant, and aesthetically pleasing black...

Heat Treatments Ltd is pleased to be able to offer the Nitreg®+ONC® process to the New Zealand market. As part of our technology agreement with Nitrex Metal Inc we have been working hard at developing and proving this sought after treatment here in our Auckland plant

For applications where resistance to atmospheric corrosion and an attractive dark finish is desirable, the Nitreg® nitride plus ONC® is the appropriate process. The objective with this treatment is to transform the very top portion of the nitride white layer into a complex spinel type structure consisting mostly of Fe₃O₄ type of iron oxide.

Such a post-nitriding oxidation treatment has an effect of enhancing the corrosion resistance of an already nitrided component while giving the surface an attractive dark finish, which is expressly desired by many customers.

ONC®, applied in combination with the Nitreg® potential-controlled nitriding or Nitro-carburising process is a clean technology that in many instances can replace chrome plating and salt bath nitriding with their inherent problems of pollution and cost.

Depending on the type of steel, parts treated with the Nitreg®+ONC® process can easily pass well over 200 hours of salt-spray test per ASTM B117 before the first corrosion spot appears.

In summary the ONC® advantage is:

1. *Improved corrosion resistance*
2. *Attractive black surface finish*
3. *Inherent wear resistance*



Comparison of corrosion test results for commercial grade chrome bar, and 4140 ground bar treated by the Nitreg®+ONC® at Heat Treatments carried out by an Independent NZ Laboratory.

Chrome bar	4140
	
ASTM B117 Salt spray: 165 hrs	

- *More wear resistant than HC.*
- *Cannot flake off like HC. No adhesion issues as it's not a coating.*
- *Uniform layer thickness (HC cant go down deep holes or bores etc).*
- *More resistant to dents and bruising than HC due to the diffusion layer below.*
- *Can be done on most steels & cast irons - MS, 1040, 4140, cast iron.*

Comparison of metallurgical and corrosion test results carried out by Nitrex on brake pistons treated by the Nitreg®+ONC® process and a competitor process.

Steel Grade	1006	4140	
White layer (µm)	17	12.5	
Oxide layer (µm)	2.5	2	
ASTM B117 Salt spray (hrs)	399	239	

The brake piston on the top treated with Nitreg®+ONC® & showed its 1st corrosion spot after 400 hours in a salt spray test.

The brake piston on the bottom was treated with a competitive technology and had 60% of its surface corroded after 400 hours.