



FNC Process **Ferritic Nitrocarburizing Salt Bath Process**

Metallurgical Solutions, Inc.

85 Aldrich Street
Providence, RI 02905

Toll Free in New England
1-877-322-5162

p: 401-941-2100
e: info@Met-Sol.com

Visit us on the web at
www.Met-Sol.com

New Service from MSI

Metallurgical Solutions, Inc., New England's premier, and last remaining salt bath heat treater, has installed a new **ferritic nitrocarburizing (FNC)** salt bath process in Providence, Rhode Island. With over 100 years of combined experience in salt bath technology it seemed only natural for MSI to bring this process to the manufacturers of New England to help enhance their products.

Over the years, this process has been known by many names; like Tuffride, Melonite, QPQ, Tenifer, or Arcor. Basically it is a molten salt nitriding process that operates at low temperatures, typically ranging between 1,000 and 1,100°F, depending on material and product geometry. It is faster and less expensive than other nitriding processes, like Ion Nitriding, and conventional gas nitriding. Ferritic Nitrocarburizing, (FNC), is a thermochemical reaction in which nitrogen, carbon, and minute amounts of oxygen atoms are driven into the surface of ferritic parts. The case produced consists of two parts, an iron nitride layer and a diffusion layer. The iron nitride layer is typically less than 0.001". Unlike gas nitriding, this process works well with less expensive, low alloy steels.

This nitrided case is extremely hard, has a low coefficient of friction, with good corrosion resistance and increased fatigue strength. When carried one step further, reintroducing the part into an oxidizing bath, an oxide will build upon the nitrided case and a handsome jet black finish can be obtained. This jet black finish is desired on some products like windshield wiper hardware and gun parts, as examples.

As a replacement for coating or plating, it offers several advantages. FNC eliminates the possibility of hydrogen embrittlement, some-



Step 1

Formation of nitride compound layer and diffusion zone for improved wear resistance.



Step 2

Immersion into oxidizing bath to form "black" iron oxide surface layer for enhanced corrosion resistance.



Step 3

Hot water wash cycle to remove salt residue.

times experienced in electro-plating operations. Unlike plating/coating, FNC adds nothing to the dimensions of a part, because it adds nothing to the surface. It is a surface conditioning process.

Finally, because the process takes place at low temperatures, the parts experience less distortion than many other heat treatments, like carbo-nitriding, or carburizing.

Natural candidates for this process would be parts that need enhanced corrosion resistance, parts that will experience severe loading, or excessive sliding wear.

**Contact MSI at 401-941-2100
for more information on how
FNC can work for you.**

FNC Process Ferritic Nitrocarburizing Salt Bath Process

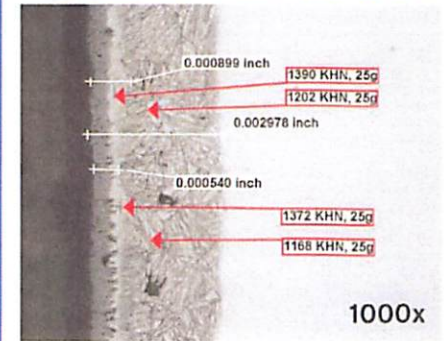
FNC surface treatment improves wear resistance, corrosion resistance and general appearance. It can be used on a variety of products and components.



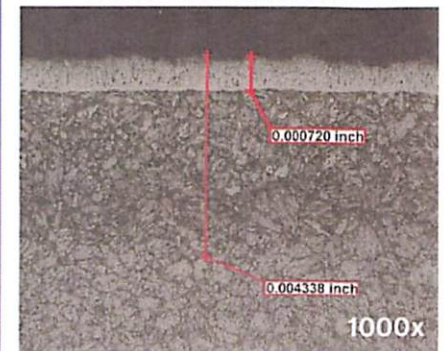
The Results

The FNC process forms a thin hard compound layer and diffusion zone composed of nitrides, which increase wear resistance. The oxidizing aspect of the process forms magnetite on the surface of the compound zone, which enhances corrosion resistance.

Martensitic Stainless Steel



4340 Low Alloy Steel



Complete List of Services

- Salt Bath Heat-Treatment of High-Speed Steel and Alloy Tool Steels
- Air Tempering
- Steam Tempering
- Salt Tempering
- Bright Tempering
- Full Annealing
- Sub-critical Annealing
- Isothermal Annealing
- Spheroidized Annealing
- Graphitized Annealing
- Cryogenic Work
- Hardness Testing
- Peen Straightening
- Overbend Straightening
- Flame Straightening
- Induction
- 48" Deep Fluid Bed and Companion Marquench
- Precipitation (Age) Hardening
- Solution Treating
- Normalizing
- Austempering
- Marquenching
- Carburizing
- Carbon Restoration
- Jominy Testing
- Selective Heat-treating
- Consulting Engineering/Failure Analysis

NEW!

Ferritic Nitrocarburizing Salt Bath Process

Metallurgical Solutions, Inc.

85 Aldrich Street
Providence, RI 02905

Toll Free in New England
1-877-322-5162

p: 401-941-2100
e: info@Met-Sol.com

Visit us on the web at
www.Met-Sol.com