**WHAT IS ONC®?**

ONC® is successfully applied to enhance corrosion and wear resistance of various grades of steel. It is a modern combination of the proven NITREG® potential-controlled nitriding process or the Nitreg®-C potential-controlled nitrocarburizing process with an integrated post-nitriding oxidation.

**ONC® ADVANTAGE**

Practically all steels can be treated by ONC®. The most popular applications being those exposed to high corrosion hazards, while retaining enhanced wear resistance. The ONC® treatment produces an attractive black surface. The appearance is still more enhanced after the application of Corr-Check™ or equivalent treatment. This is a liquid-based corrosion inhibitor impregnated into the surface, which forms a dry, glossy finish, and provides additional corrosion protection.

**HOW DOES ONC® WORK?**

The process comprises three distinct phases:

1. Nitreg® or Nitreg®-C, in which automatic potential control ensures the obtaining of a white layer designed for optimum wear and corrosion resistance.

2. Post-nitriding oxidation, carried out after the nitriding stage, as an integral part of the treatment cycle, i.e. in the same retort, by the introduction of an oxidizing medium. A thin, 1–3 µm (0.00004-0.00012") complex oxide surface layer is formed, further improving corrosion resistance. The surface assumes an attractive black appearance, desirable in many applications.

3. Corr-Check™ or equivalent treatment. This optional stage represents immersion at ambient temperature in an inhibitor-containing bath, for a time not exceeding 1 minute. The medium containing the corrosion inhibitor is retained in micropores in the external zone of the white layer, offering additional corrosion protection during service.

**ONC® can treat various grades of steel used in**

- automotive
- hydraulic and
- tooling applications

It is ideal for applications made of

- unalloyed and
- low alloy steels

that are exposed to a corrosive environment.
PUTTING ONC® TO THE TEST

Depending on the type of steel, parts treated in the ONC® process can easily pass well over 200 hours of salt-spray test per ASTM B117 before the first corrosion spot appears. A comparison of corrosion test results obtained on three different applications, manufactured from different materials treated by the ONC® process, is shown below.

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>Automotive Seat Rails</th>
<th>Throttle Valves</th>
<th>Automotive Shafts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel Grade</td>
<td>1006</td>
<td>1144</td>
<td>4140</td>
</tr>
<tr>
<td>Microstructure</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
<tr>
<td>Time in Salt-Spray to First Corrosion Spot (in Hours)</td>
<td>339</td>
<td>483</td>
<td>239</td>
</tr>
</tbody>
</table>

EXAMPLES OF TYPICAL APPLICATIONS

- Treated by ONC® and Corr-Check™
- Treated by competitive process
- Appearance After 400 Hours in Salt Spray
- Treated by ONC® and Corr-Check™
- Treated by competitive process