Liquid Nitrocarburizing (LNC) with QPQ

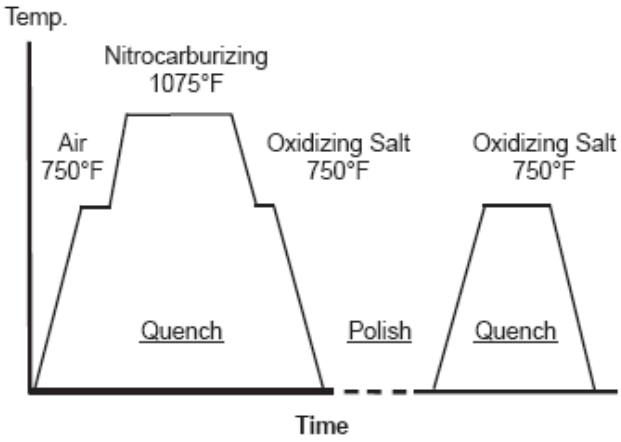
Caliper Pistons with Liquid Nitrocarburizing with QPQ

Also known as “liquid nitriding” or “salt bath nitriding” liquid nitrocarburizing is a thermochemical process that simultaneously diffuses both nitrogen and carbon into the surface of ferrous metals. The process is carried out in a liquid salt bath at a subcritical treatment temperature, typically 1075°F (580°C). This results in improved wear resistance, lubricity, fatigue strength, and corrosion resistance.

Quench Polish Quench (QPQ)

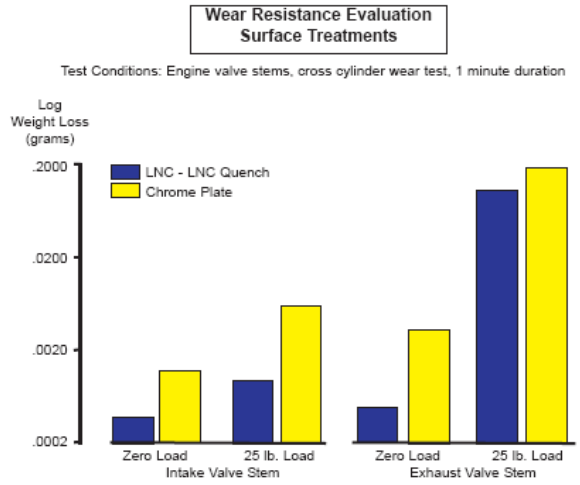
Nitrocarburizing can also be enhanced by incorporating a sequence of treatments consisting of a mechanical polish and salt bath oxidation, known as quench polish quench (QPQ). It begins with the treating cycle of the nitrocarburizing segment, i.e. pre-heat, nitrocarburizing salt, oxidizing salt bath quench, which produces a layer of epsilon iron nitride. The next step is a mechanical polish of the nitride layer, thus restoring the original surface finish. Finally, to optimize the corrosion resistance, the component is then re-immersed in the oxidizing salt quench bath for 20-30 minutes.

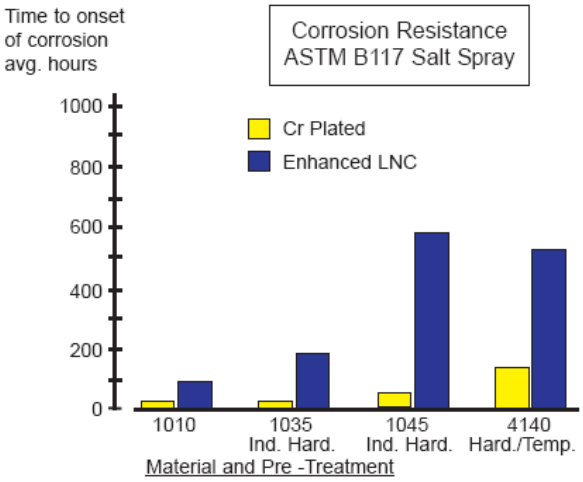
The complete process results in the formation of an iron nitride compound with a thin overlay of iron oxide, resulting in a significant increase in corrosion protection. In addition, the process provides an aesthetically appealing lustrous black surface finish.

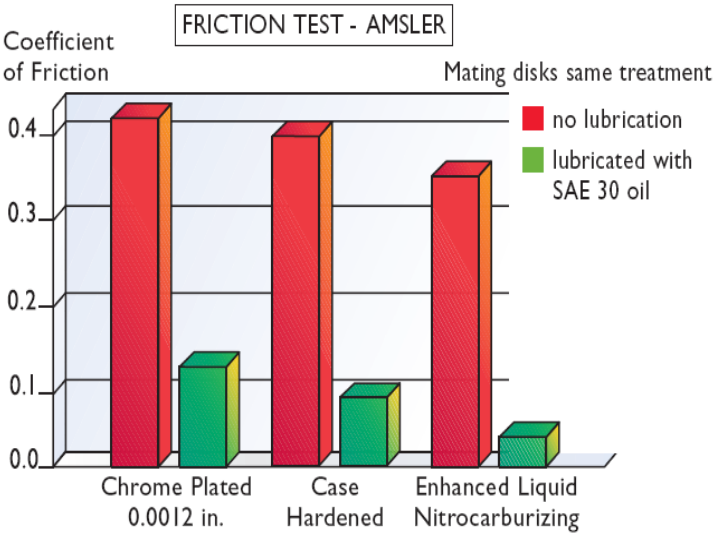


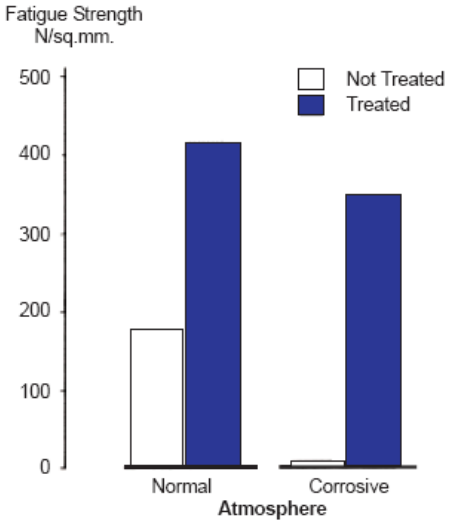
LNC with QPQ vs Chrome Plating

Liquid nitrocarburizing with QPQ produces engineering and surface properties of ferrous metals that are actually better than those produced through chrome plating. The benefits of chromium plating including wear resistance, lubricity, fatigue strength, and corrosion are all improved when ferrous metals have undergone LNC with QPQ.









LNC with QPQ significantly enhances the corrosion protection, wear resistance, lubricity and fatigue strength of cast iron and steel components and thus provides a more effective alternative to chrome and nickel plating. Furthermore, this process also provides an appreciable reduction in material and manufacturing costs.