

# PL02

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## **Nitriding and Nitrocarburizing; an Interwoven Braid of Science and Innovation**

Nitriding and nitrocarburizing constitute a class of surface engineering methods whereby a steel workpiece is intentionally alloyed with nitrogen/carbon at elevated temperature, in order to prolong the lifetime under conditions of corrosion, fatigue and wear, or combinations thereof. The lecture covers some highlights of the part of the author's career that involves research and innovation in gaseous nitriding and nitrocarburizing of iron and steel, ranging from fundamental to applied and from experimental to numerical.

The following topics are touched upon:

- Thermodynamics and kinetics understanding of nitriding iron
- The role of carbon in compound-layer formation
- Expanded austenite in nitrided and nitrocarburized stainless steels
- High-temperature solution nitriding for materials innovation
- Nitriding of additively manufactured (stainless) steel components.

