

Influence of plastic deformation on low temperature surface hardening of stainless steel by gaseous nitriding - DTU Orbit (08/11/2017)

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This article addresses an investigation of the influence of plastic deformation on low temperature surface hardening by gaseous nitriding of three commercial austenitic stainless steels: AISI 304, EN 1.4369 and Sandvik Nanoflex® with various degrees of austenite stability.

The materials were plastically deformed to different equivalent strains by uniaxial tension. Gaseous nitriding of the strained material was performed in ammonia at atmospheric pressure in the temperature range 693-703 K. Microstructural characterization of the as-deformed states and the nitrided case included X-ray diffraction analysis, reflected light microscopy and microhardness indentation. The results demonstrate that a case of expanded austenite develops and that, in particular, the presence of strain-induced martensite in the initial (deformed) microstructure has a large influence on the nitrided zone.

General information

State: Published

Organisations: Department of Mechanical Engineering, Materials and Surface Engineering

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Pages: 612-619

Publication date: 2015

Host publication information

Title of host publication: Heat Treating 2015: Proceedings of the 28th ASM Heat Treating Society Conference

Publisher: ASM International

ISBN (Electronic): 978-1-62708-105-4

Main Research Area: Technical/natural sciences

Conference: 28th ASM Heat Treating Society Conference, Detroit, MI, United States, 20/10/2015 - 20/10/2015

Publication: Research - peer-review › Article in proceedings – Annual report year: 2015