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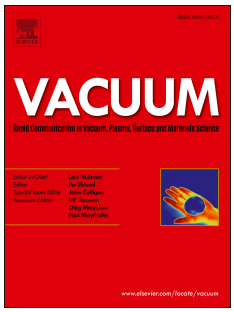

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PII: S0042-207X(17)31450-1

DOI: 10.1016/j.vacuum.2018.04.016

Reference: VAC 7921

To appear in: *Vacuum*

Received Date: 20 October 2017

Revised Date: 2 April 2018

Accepted Date: 11 April 2018

Please cite this article as: Dong Y, Bell T, Li X, Dong H, A novel double-stage pulsed plasma bright nitriding of spheroidal graphite (SG) cast iron, *Vacuum* (2018), doi: 10.1016/j.vacuum.2018.04.016.

A novel double-stage pulsed plasma bright nitriding of spheroidal graphite (SG) cast iron

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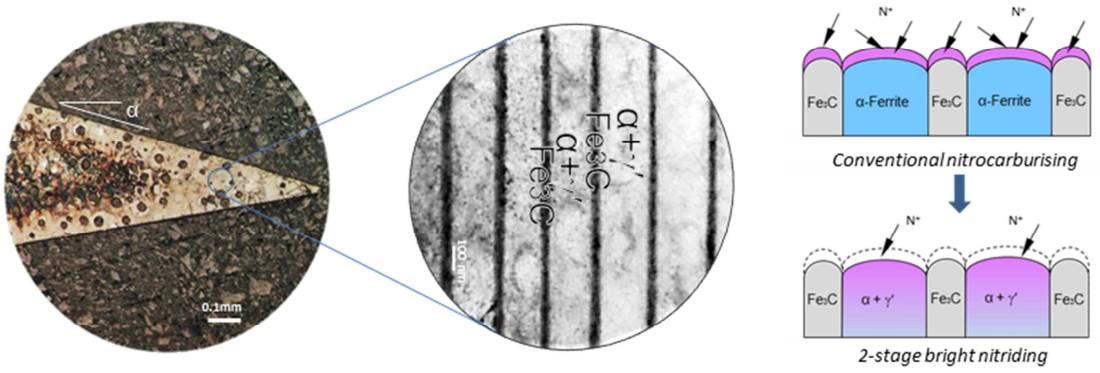
Abstract

To alleviate spallation and effectively hardened the spheroidal graphite cast iron, a diffusion-prevalent hardened case was produced on the spheroidal graphite iron surface by a new two-stage bright nitriding process. The unique feature of this process in treating the sharp edges with high strength and controllable layer thickness has been emphasised. An exceptionally deep diffusion layer of 300um was produced during bright nitriding, and the formation and thickness of the compound layer were easily controlled in this continuous short nitriding process. The produced hardened case mainly composed by polyphase of α/Fe_4N, in comparison to the conventional Fe_2N_3/Fe_4N of compound layer, are formed along the new pearlite laminae, which results in significantly improved surface hardness and corrosion resistance.



Keywords

phase transformation; diffusion; nitriding; cast iron; hardness; surface hardening

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