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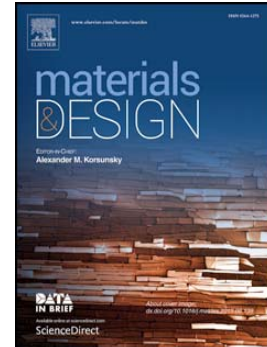
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Research on fatigue behavior of the flash welded joint enhanced by ultrasonic peening treatment

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Abstract

The flash welded joint of U75V steel has been widely used in high-speed railway. Considering the fact that fatigue failure is the main failure mode of high-speed railway, ultrasonic peening treatment (UPT) was used to improve the fatigue performance of the flash welded joint. Micro-structure, hardness, wear resistance, corrosion resistance and fatigue fracture mechanism of the flash welded joint before and after UPT were analyzed in detail. Results show that nanocrystals form on the surface of the welded joint after UPT. Fatigue life, wear resistance and corrosion resistance of the welded joint were improved for the surface strengthening caused by UPT.

Keywords: Flash welded joint; Ultrasonic peening treatment; Nanocrystal; Fatigue

1. Introduction

High-speed railway has become a practical and reliable transportation way for its high speed and safety. Aiming to extend the service life of high-speed railway, some high-strength steels are adopted. U75V steel with a high mechanical strength has been widely applied in the present railway industry^[1]. Seamless docking technology

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