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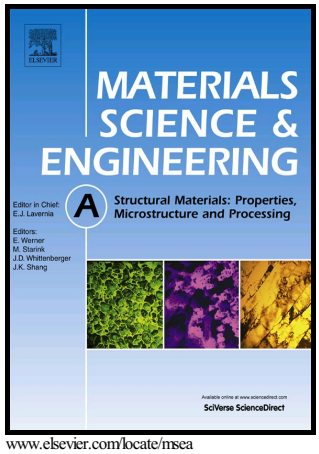

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Fatigue behavior of a harmonic structure designed austenitic stainless steel under uniaxial stress loading

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Abstract

Harmonic structured materials present a good balance of high strength and high ductility due to their peculiar network structure topology. Since long-term durability is critical for their practical applications, so the present work investigated the fatigue properties of a harmonic structured austenitic stainless steel at room temperature under uniaxial stress loading. The harmonic structure designed SUS316L steels were prepared by mechanical milling and subsequent hot isostatic pressing. The enhanced tensile strength in the harmonic structured SUS316L steels was attributed to the ultrafine grains (shell region), which also resulted in the improved resistance to fatigue crack initiation during cyclic loading. Compared to the conventional SUS316L bulk, increased

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