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Abstract

The effect of austenitization time on the fatigue crack resistance of transformation-induced plasticity (TRIP)-maraging steel was investigated by observing the crack initiation site, propagation path and fracture surface. Our analyses show that austenitization for a longer time increases austenite/martensite lamella size and connectivity of austenite. Simultaneously, increasing lamella size leads to a reduction in austenite hardness; higher austenite connectivity accelerates crack propagation. In addition, remarkable roughness on the crack surface associated with the laminated structure was observed in both steels, which caused roughness-induced crack closure.

Keywords: Transformation-induced plasticity-maraging steel; Lamella; Crack growth rate; Crack closure; High cycle fatigue

ABBREVIATIONS

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