

### 论文摘要

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## 2524-T34合金疲劳裂纹的萌生和扩展行为

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**摘要:** 通过四点弯曲疲劳试验研究2524-T34板材的疲劳性能, 借助金相和扫描电镜观察疲劳裂纹的萌生和扩展行为。结果表明: 2524合金具有良好的疲劳性能, 疲劳强度达到屈服强度的80%以上; 疲劳裂纹主要在第二相粒子以及第二相粒子/基体界面萌生, 裂纹扩展过程中的偏转与晶界的阻碍有关; 相邻晶粒内两个有利滑移面之间的位向差是控制裂纹通过晶界扩展的重要因素。

**关键字:** 2524合金; 疲劳裂纹; 萌生; 扩展; 显微组织

## Initiation and propagation behavior of fatigue crack in 2524-T34 alloy

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**Abstract:** The fatigue performance of 2524-T34 sheets was studied by four-point bend fatigue test. The fatigue crack initiation and propagation behavior were observed by optical microscopy and scanning electron microscopy. The results indicate that 2524 alloy shows superior fatigue properties. The fatigue strength is up to 80% of the yield strength. The fatigue crack mainly initiates from the second phase particles and the interface between the second phase particles and matrix. The crack plane deflection in the process of crack propagation relates to the resistance of the grain boundary. The difference of crystallographic orientation between the two favoured slip planes within the two neighboring grains is an important factor to control crack propagation across a grain boundary.

**Key words:** 2524 alloy; fatigue crack; initiation; propagation; microstructure

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