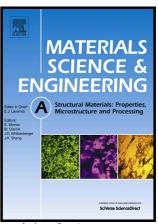
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Micro-morphology of Fatigue Crack Initiation and Propagation Behavior in High

Strength Aluminum Alloy

Haigen Jian^{1, 2}, Jian Luo¹, Ling Ou¹, Xianmin Tang ^{1*}, Cheng Yan²

1. Hunan University of Technology, Zhuzhou 412007, China

2. Queensland University of Technology, Queensland 4001, Australia

*Corresponding author. Tel: +86-13973386987; fax: +86-731-22183465. tangxianmin@hut.edu.cn

Abstract

The microscopic morphology of fatigue crack initiation and propagation behavior was

investigated for B93пч high strength aluminum using optical microscopy, scanning electron

microscopy and transmission electron microscopy. The results show that, the fatigue micro-crack

generally initiates on the surface from broken coarse particle, interface between particle and

matrix and grain boundary. The micro-crack initiation has the characteristics of randomness and

diversity and the main crack is generally formed on the surface of the specimen. Fatigue crack

propagation path may deviate from the direction with the max loading and appear in the form of

deflection, fork, convergences and bridge connectivity. This can be attributed to the influence of

microstructural characteristics, which also affect the fatigue crack propagation direction and

growth rate.

Key words: high strength aluminum alloy; crack propagation; crack deflection; bridge

connectivity

1. Introduction

B93пч high strength aluminum alloy in this study can match with the 7075 (United States),

widely applied in aerospace, military, transportation and other fields due to the characteristics of

low density, high strength and hardness and good processability, which has become one of the

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