Study on the fretting fatigue behavior of alloy ZSGH4169 at different temperatures

zeyu xing¹, Hongjian Zhang², HAITAO CUI², ziqiang yu², xiaodong yan², and WEIDONG WEN²

¹Affiliation not available

²Nanjing University of Aeronautics and Astronautics

November 16, 2020

Abstract

In this paper, nickel-based alloy ZSGH4169 was used as the test material and the fretting fatigue test of standard test pieces was carried out to study the variation rule of its fretting fatigue life under different temperatures and loads. The results show that the fretting fatigue life of ZSGH4169 decreases with the increase of temperature and load. Through fracture analysis under different working conditions, it can be seen that ZSGH4169 fretting fatigue failure form is basically the same, the crack expands in the form of transgranular fracture propagation. Temperature and load have significant influence on the depth of fretting fatigue crack initiation zone and the fatigue band spacing in the propagation zone, which affects its fretting fatigue life. According to the analysis of crack initiation and propagation path, the crack initiation angle of fretting fatigue crack is mainly affected by temperature. With the increase of temperature, the crack initiation angle increases, however the load has little influence on the crack initiation angle.

Hosted file

Study on the fretting fatigue behavior of alloy ZSGH4169 at different temperatures.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure1.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure2.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure3.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure4.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure5.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure6.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure7.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure8.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure9.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure10.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure11.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure12.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure13.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure14.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure15.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure16.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

figure17.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

table1.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

table2.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

table3.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

table4.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>

Hosted file

table5.pdf available at <https://authorea.com/users/376233/articles/493274-study-on-the-fretting-fatigue-behavior-of-alloy-zsgh4169-at-different-temperatures>