

Author's Accepted Manuscript

Improving the fatigue strength of 7075 alloy through aging

L. Leng, Z.J. Zhang, Q.Q. Duan, P. Zhang, Z.F. Zhang



PII: S0921-5093(18)31244-9
DOI: <https://doi.org/10.1016/j.msea.2018.09.047>
Reference: MSA36928

To appear in: *Materials Science & Engineering A*

Received date: 2 August 2018
Revised date: 13 September 2018
Accepted date: 14 September 2018

Cite this article as: L. Leng, Z.J. Zhang, Q.Q. Duan, P. Zhang and Z.F. Zhang, Improving the fatigue strength of 7075 alloy through aging, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2018.09.047>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Improving the fatigue strength of 7075 alloy through aging

L. Leng, Z. J. Zhang^{*}, Q. Q. Duan, P. Zhang, Z. F. Zhang^{*}

Materials Fatigue and Fracture Division, Shenyang National Laboratory for Materials Science,
Institute of Metal Research, Chinese Academy of Sciences, Shenyang 110016, China

Email: zjzhang@imr.ac.cn;

Email: zhfzhang@imr.ac.cn,

*Corresponding authors: Z. J. Zhang, Tel: 0086-24-83978226,

*Corresponding authors: Z. F. Zhang, Tel: 0086-24-23971043,

Abstract

In order to optimize the fatigue strength of 7075 Al alloy, the hardness, tensile and fatigue tests as well as the microstructure observation under different aging conditions were investigated. The result indicates that, with the aging time increasing, the precipitation spacing first decreases and then increases, which leads to the hardness and tensile strength first increasing and then decreasing. With the increase of yield strength, the fatigue strength increases first and then decreases, resulting in an optimization of fatigue strength. Especially, the specimen aged at 120 °C for 48 h with strength and elongation in middle of the three specimens exhibits the highest fatigue strength of 165 MPa. Considering the effect of yield strength on fatigue strength and fatigue damage, the causes for the parabolic variation of fatigue strength were analyzed.

Keywords: 7075 Al alloy, Aging treatment, Hardness, Tensile strength, Fatigue strength

Download English Version:

<https://daneshyari.com/en/article/10646571>

Download Persian Version:

<https://daneshyari.com/article/10646571>

[Daneshyari.com](https://daneshyari.com)