

## Accepted Manuscript

Laves phase in alloy 718 fusion zone — microscopic and calorimetric studies

S.G.K. Manikandan, D. Sivakumar, K. Prasad Rao, M. Kamaraj

PII: S1044-5803(14)00401-X  
DOI: doi: [10.1016/j.matchar.2014.11.035](https://doi.org/10.1016/j.matchar.2014.11.035)  
Reference: MTL 7776

To appear in: *Materials Characterization*

Received date: 12 April 2014  
Revised date: 17 November 2014  
Accepted date: 22 November 2014



Please cite this article as: Manikandan SGK, Sivakumar D, Prasad Rao K, Kamaraj M, Laves phase in alloy 718 fusion zone — microscopic and calorimetric studies, *Materials Characterization* (2014), doi: [10.1016/j.matchar.2014.11.035](https://doi.org/10.1016/j.matchar.2014.11.035)

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 proof before it is published in its final 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.

**Laves phase in Alloy 718 Fusion Zone – Microscopic and Calorimetric studies**

SGK.Manikandan<sup>1</sup>, D.Sivakumar<sup>2</sup>, K.Prasad Rao<sup>3</sup>, M.Kamaraj<sup>4</sup>

<sup>1,2</sup>Indian Space Research Organization, India,

<sup>3</sup> University of Utah, Salt lake city, Utah

<sup>4</sup>Indian Institute of Technology Madras, India

nehakutty06@gmail.com<sup>1</sup>, d\_sivakumar@vssc.gov.in<sup>2</sup>, jyothi@pr@gmail.com<sup>3</sup>, kamaraj@iitm.ac.in<sup>4</sup>,

+919442305959

**Abstract**

Microstructural characterization of Alloy 718 fusion zone welded with both solid solution and age hardenable filler metal has been done. The microsegregation and the aging response were studied by employing three levels of weld cooling rate. Gas Tungsten Arc welding process was used. The fusion zone of solid solution filler metal has been responding to the aging treatment due to the weld process conditions and weld metal chemistry. However the weld metal composition was modified due to the higher molybdenum (Mo) content in solid solution filler metal. The effect of this modification on the phase reaction temperatures was studied and the same was compared with the conventional filler metal.

**Keywords:** Alloy 718, Gas Tungsten Arc Welding, Laves phase, X-ray diffraction, Differential scanning calorimetry

**Introduction**

Alloy 718 is a high strength Ni-Fe base superalloy and is one of the indispensable superalloys in the aerospace applications. This alloy is extensively used in the high temperature systems of cryogenic rocket engines. Alloy 718 was practiced to be welded in the solution treated condition and subsequent age hardened, since it had excellent strain age cracking resistance by the sluggish precipitation kinetics of the principal strengthening precipitate  $\gamma''$ [1]. The solidification behavior of alloy 718 was well investigated and the

Download English Version:

<https://daneshyari.com/en/article/7970576>

Download Persian Version:

<https://daneshyari.com/article/7970576>

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