

Accepted Manuscript

Analysis of cracks in the electron beam welded joint of K465 nickel-base superalloy

Ke Han, Houqin Wang, Lei Shen, Binggang Zhang

PII: S0042-207X(18)31144-8

DOI: [10.1016/j.vacuum.2018.08.011](https://doi.org/10.1016/j.vacuum.2018.08.011)

Reference: VAC 8158

To appear in: *Vacuum*

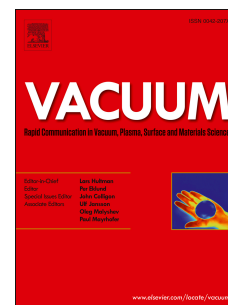
Received Date: 5 July 2018

Revised Date: 7 August 2018

Accepted Date: 8 August 2018

Please cite this article as: Han K, Wang H, Shen L, Zhang B, Analysis of cracks in the electron beam welded joint of K465 nickel-base superalloy, *Vacuum* (2018), doi: 10.1016/j.vacuum.2018.08.011.

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.



Analysis of Cracks in the Electron Beam Welded Joint of K465

Nickel-Base Superalloy

Ke Han, Houqin Wang, Lei Shen, Binggang Zhang*

State Key Laboratory of Advanced Welding and Joining, Harbin Institute of Technology, 150001, China

Abstract: The weldability of K465 nickel-based superalloy by electron beam weld (EBW) was studied, and the microstructural evolution and cracking characteristics were also investigated. The microstructure of fusion zone (FZ) were mainly γ dendrite, Chinese-script MC carbides, the interdendritic γ/γ' eutectic and fine γ' particles precipitated from dendritic and interdendritic region. The solidification cracking of FZ and intergranular liquation cracking in heat affected zone (HAZ) were observed in the joint. Solidification cracking was caused by the residual liquid metal originated from segregation of Ti, Nb and Al elements in interdendrite region at the last stage of solidification. And the HAZ liquation cracking was associated with the constitutional liquation of γ' , MC carbides, and melting of Cr-rich boride. With the increased heat input, the susceptibility of solidification cracking and liquation cracking presented different variation. And this variation of cracking susceptibility was discussed in this paper.

Keywords: K465 alloy; Weldability; Electron Beam Welding; Solidification cracking; Liquation cracking

* Corresponding author.

E-mail address: zhangbg@hit.edu.cn.

Download English Version:

<https://daneshyari.com/en/article/8943494>

Download Persian Version:

<https://daneshyari.com/article/8943494>

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