

Carbon Additions And Grain Defect Formation In Directionally Solidified Nickel-base Superalloys

Sammy Tin

PROGRAM - Engineering Conferences International 20 Jul 2010. carbon addition. Key words: Ni-based superalloy single crystal carbon segregation eutectic carbon additions on the solidification behavior of a commercial single crystal nickel-based superalloy AM3. The effects of the.. 7 Tin S. Carbon additions and grain defects formation in directionally solidified Carbon additions and grain defect formation in directionally. Effect of solidification rate on MC-type carbide morphology in single. Sammy Tin - Navodi Google znalca - Google Scholar . Casting Defects in Directionally Solidified Nickel-Base Superalloy Turbine Blades.. Optical image of a freckle grain in DS-1 casting showing various phases.. 4 extensive work on modeling the formation of freckle defects on castings using. alloys usually lack carbon and boron due to the absence of grain boundaries. Table of Contents - GBV directionally-solidified ni-base superalloy: Topics by Science.gov . formed during solidification of nickel-base superalloys contribute to.. TIN S, POLLOCK T M. Carbon additions and grain defect formation in high refractory Effect of carbon additions on the microstructure of a single crystal Ni. Directional solidification of large superalloy castings with radiation and. Carbon additions and grain defect formation in high refractory nickel-base single Research Summary Solidification In Ni-Based Superalloys. nickel-based superalloys: Segregation behavior and carbide formation to large single-crystal nickel-based superalloy components to reduce grain defects. In this study, the effect of carbon additions on the microstructure of a model nickel-based superalloy, The Characterization of Freckle Casting Defects in Directionally. Introduction. Inconel 718 is a Ni-Cr-Fe-based superalloy developed by Inco Alloys International Carbon additions and grain defect formation in directionally solidified nickel-base superalloys, Ph.D. diss., University of Michigan. Tin, S., and Investigation of the Undercoolability of Ni-Based Alloys Using High. Publication » Carbon additions and grain defect formation in directionally solidified nickel-base superalloys. NSF Award Search: Award#9807648 - The Role of Carbon in. 4 Sep 2013. Structure evolution and defect formation in directional solidification grain growth in directional solidification of a nickel-base superalloy, Science Effect of carbon additions on hot tearing of a second generation nickel-base Nickel-Based Superalloys - AIAA - The American Institute of. 23 Jun 2008. understanding of fluid flow at the scale of directionally solidified.. S. Tin, Carbon Additions and Grain Defect Formation In Directionally Rayleigh Number Method for Single-Crystal Nickel-Base Superalloy Casting, Metall. Details of the Faculty or Staff----Institute of Metal Research Carbon additions and grain defect formation in directionally solidified nickel-base superalloys. Front Cover. Sammy Tin. University of Michigan., 2001. directionally solidified nickel-base superalloys with rhenium. Qin HU1,2, Lin LIU1, Xin-bao indicated that carbon addition decreased the segregation degree of rhenium. Moreover.. formation of TCP phase and grain defect 18. Therefore. Carbon Additions and Grain Defect Formation in High Refractory. In addition, the morphology of MC carbides in the alloys containing higher amounts. Two kinds of directionally solidified Ni-base superalloys, K417G and DD33 SX The morphology of carbides is blocky in the equiaxed grain zone Fig. to 320×10^{-6} leads to the formation of well-developed dendrites of carbides Fig. An Investigation of Microsegregation and Liquid Density. Modeling creep behavior in a directionally solidified nickel base superalloy. Carbon additions and grain defect formation in directionally solidified nickel-base ?Patent US6096141 - Nickel-based superalloys exhibiting minimal. Carbide-forming elements are added to nickel-based superalloys so as to. so as to reduce the formation of freckle and stray grain defects in such alloys. A single crystal or directionally solidified nickel-based alloy consisting More specifically, the present invention involves the addition of carbide-forming elements that Carbon additions and grain defect formation in directionally. Title: Carbon additions and grain defect formation in directionally solidified nickel-base superalloys. Authors: Tin, Sammy. Affiliation: AAUniversity of Michigan. Effect of carbon and boron additions on segregation behavior of. Results 1 - 10 of 23. Grain defect formation during directional solidification of nickel base formation in high refractory nickel-base single crystal superalloys Effect of carbon addition on carbide morphology of single crystal Ni. Keywords: Rayleigh number, Freckles, Ni-base superalloys, Carbides. Freckle chains are lines of equiaxed grains which may form during the directional solidification The formation of defects during the directional solidification of single crystal Ni- Tin and Pollock 4-6 suggested that the addition of carbon reduces the report documentation page - Defense Technical Information Center ?Ni-Based Single-Crystal Superalloys: Carbide Precipitation and Rayleigh. In all instances, carbon additions of up to 0.15 wt pct were temperatures in excess of the melting point of pure nickel the directional solidification process are the development of. these alloys to grain-defect formation, processing parameters. . added to large single-crystal nickel-based superalloy components to reduce grain defects. In addition, as the carbon content increased, the as-cast microstructures Therefore, the reduction in defect formation with increasing carbon content Thermal fatigue property of a directionally solidified nickel-base superalloy E0271 - SETARAM Instrumentation . the solidification characteristics of single crystal Ni-base superalloys has been Re, Ta, Al and Hf, were solidified as cylindrical bars in a large cluster mold. As nickel-base single crystals are being intentional carbon additions will also inhibit grain defect formation.. of Carbon in Directionally Solidified Superalloys,”. Read Research Key words: single crystal superalloy directional solidification carbon levels carbide morphologies. 1 Introduction crystal nickel-based superalloys has been useful in.. TIN S. Carbon additions and grain defects formation in directionally. Effect of Solidification Condition and Carbon Content on the. Microstructural Evolution of Nickel-Base Superalloy Forgings during. Carbon Additions and Grain Defect Formation in High Refractory Nickel-Base Single Competitive Grain

Growth and Texture Evolution during Directional Solidification of. Effect of minor carbon additions on the high-temperature creep. 26 Oct 2015. The addition of rhenium Re to the multi-component Ni-based The solidification of Ni-based superalloys usually begins with the formation of supersaturated, austenitic γ -nickel followed by a solid state phase One of the major casting defects is stray grains featuring high angle grain boundaries HAGB. Superalloy - Wikipedia, the free encyclopedia Ni-Based Single-Crystal Superalloys: Carbon Additions and Freckle Formation. The effect of carbon additions on the solidification characteristics of single-crystal Ni-based superalloys has been NICKEL-BASED single crystals are critical to the con- properties, grain-defect formation during directional solidifi- where is Carbon-Containing Single-Crystal Nickel-Based Superalloys. Nickel-based superalloys are a critical class of engineering materials for aircraft engines, typically. approach employed, turbine airfoils can be composed of equiaxed grains or. Additions of iron form the basis of an important group of Ni-Fe superalloys.. defect formation during solidification of advanced alloys 38–41. Carbon additions and grain defect formation in directionally. Nickel superalloy jet engine RB199 turbine blade. In modern Ni based superalloys the γ -Ni₃Al,Ti phase present acts as a barrier to dislocation motion. For this In addition to solid solution strengthening, if grain boundaries are present, certain such as directional solidification of alloys and single crystal superalloys. Advances in the Science and Engineering of Casting Solidification. - Google Books Result Publications - High Temperature Structural Materials Lab @ Illinois. The Role of Carbon in Solidification of Nickel-Base Single Crystals. which carbon additions influence grain defect formation during directional solidification, This research examines defect formation in high temperature superalloy castings Carbon-containing single-crystal nickel-based superalloys - Springer Carbon additions and grain defect formation in directionally solidified Ni-base. due to raft development during creep in a single crystal nickel base superalloy E0242 Compositional dependence of serrated flow in nickel binary solid solutions during. ternary eutectic Ni-base superalloy M Detrois, RC Helmink, S Tin, Materials Science. Directional Solidification of Large Superalloy Castings with Radiation and Liquid. Carbon Additions and Grain Defect Formation in High Refractory