

**EFFECT OF REHEAT TREATMENT CONDITIONS ON MICROSTRUCTURAL
REFURBISHMENT IN CAST NICKEL BASE SUPERALLOY, MGA 1400**

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Abstract

This Project has an aim to evaluate and investigate the effect of heat treatment conditions on microstructural refurbishment in cast nickel base superalloy, grade MGA 1400. This cast nickel base superalloy used as turbine blade material. The evaluated reheat treatment programs consist of solution treatment at 1125°C, 1150°C and 1175°C for 2, 4 and 6 hours then following with primary aging at 925°C for 2 hours and secondary aging at 845°C for 25 hours respectively. All reheat treated microstructures were examined and analyzed by SEM and image analysis program, namely, "ImageJ". From all obtained results, it was found that the most proper solution treatment is at temperature of 1125°C for 2 hours to provide the most uniform microstructural characteristics, which consist of the uniform distribution of very dense gamma prime particles precipitating in the matrix. This microstructure also provides the highest area fraction of gamma prime phase and the most proper average size of the gamma prime particles.

Keywords: Reheat treatment, precipitate phase, microstructure, superalloy

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