

The Role of Deformation Strain and Annealing Temperature on Grain Boundary Engineering and Texture Evolution of Haynes 230

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Abstract : The present study investigates the effects of deformation strain and annealing temperature on the formation of twin boundaries, deformation and recrystallization texture evolution and grain boundary networks and connectivity. The resulting microstructures were characterized using Electron Backscatter Diffraction (EBSD) and X-Ray Diffraction (XRD) both immediately following small amount of deformation and after short time annealing at high temperature to correlate the micro and macro texture evolution of these alloys. Furthermore, this study showed that the process of grain boundary engineering, consisting cycles of deformation and annealing, is found to substantially reduce the mass and size of random boundaries and increase the proportion of low Coincidence Site Lattice (CSL) grain boundaries.

Keywords : coincidence site lattice, grain boundary engineering, electron backscatter diffraction, texture, x-ray diffraction

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