

Development of Long and Short Range Ordered Domains in a High Specific Strength Steel

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Abstract : Microstructural development when annealed at different temperatures in a high aluminum and manganese light weight steel has been examined. The FCC matrix of the manganese (Mn)-rich and nickel (Ni)-rich areas in the studied Fe-Mn-Al-Ni-C-light weight steel have been found to contain anti phase domains. In the Mn-rich region short order range of domains manifested by the diffuse scattering in the electron diffraction patterns was observed. Domains in the Ni-rich region were found to be arranged periodically validated through lattice imaging. The nature of these domains can be tuned with annealing temperature resulting in profound influence in the mechanical properties.

Keywords : Anti-phase domain boundaries, BCC, FCC, Light Weight Steel

Conference Title : ICFE 2020 : International Conference on Fatigue and Fracture

Conference Location : Paris, France

Conference Dates : March 26-27, 2020