

## **Influence of microstructural morphology on residual stress and distortion in a welded structure**

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### **ABSTRACT**

The minimization of tensile residual stress is one of the primary objectives of a welded structure since the progress of compressive residual stress improves the fatigue life. The understanding of the evolution of microstructure is necessary that may improve the mechanical properties of a welded joint. The interaction of microstructure with residual stress generation is normally performed through experiments. The simple thermo-mechanical model is not enough to explain the nature and distribution of residual stress since it considers only the boundary interactions and the plasticity law without the knowledge of micromechanics and transformation kinetics. Therefore, the understanding of microstructural morphology to develop a well posed thermal-metallurgical-mechanical model is helpful to correctly predict the residual stress in a welded structure. The present work is oriented in similar direction where the importance of microstructural morphology on the development of phase transformation kinetics and accordingly the prediction of residual stress and distortion for different materials (steels, titanium alloy etc.) are discussed.

