

عنوان مقاله:

Geometrical Optimization of the Cast Iron Bullion Moulds Based on Fracture Mechanics

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خلاصه مقاله:

In this paper, the causes of the crack initiation in cast iron bullion moulds in Meybod Steel Corporation are investigated and then some new geometrical models are presented to replace the current moulds. Finally, among the new presented models and according to the life assessment, the best model is selected and suggested as the replaced one. For this purpose, the three recommended moulds were modeled and analyzed by ANSYS software. First, a thermal analysis and then a thermo-mechanical coupled field analysis were performed on each three model. The results of the analysis are used to determine the critical zone. The critical zone is selected on the symmetric axis of the inner surface of the mould. By comparing the principle stress contours and temperature distribution contours of three models, one of the suggested models was selected as optimized geometrical model. Then, the crack modeling and the life assessment on the optimized model were implemented and the total life of the model was calculated. Comparison of the life of the optimized and the initial models shows an increase in the life of the suggested model. The results are verified with the experiments

کلمات کلیدی:

Optimization, Fatigue, Creep, Crack Propagation, Cast iron

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