

عنوان مقاله:

The Fracture Toughness of the Welding Zone in Gas Transfer Steel Pipes by Experimental and Numerical Methods

محل انتشار:

فصلنامه مکانیک جامد، دوره 14، شماره 2 (سال: 1401)

تعداد صفحات اصل مقاله: 9

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خلاصه مقاله:

Fracture toughness is a criterion to determine the resistance of materials against small longitudinal and peripheral cracks, which can be created in the effect of welding or peripheral effects. Therefore, it is extremely important to scrutiny the factors that impress crack treatment and the way that it grows. In this research, fracture toughness was investigated on the peripheral welding zone in gas and oil transfer pipelines made in steel API X65. The fracture toughness is derived by using two different methods. At first, the three-point bending test method was used on samples that made up of the peripheral welding zone. Then, with a numerical simulation it was calculated by ABAQUS software v6/10. The comparison of experimental results and computer simulation results shows good agreement from two methods. The fracture toughness of the welded zone, obtained in this study, was compared with that of the base metal. The results showed that fracture toughness on the welding zone in gas and oil transfer steel pipelines decreased ۴۳% compared to the base metal. This issue shows that peripheral welding on gas and oil transfer pipelines has more talent for crack growth compared to the base metal.

کلمات کلیدی:

fracture toughness, Gas and oil pipeline, Three-point bending test, Abaqus Software

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