

Failure Analysis of a 304 Stainless Steel Flange Crack at Pipeline Transportation of Ethylene

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Abstract : In the current research, a catastrophic failure of a 304 stainless steel flange at pipeline transportation of ethylene in a petrochemical refinery was studied. Cracking was found in the flange after about 78840h service. Through the chemical analysis, tensile tests in addition to microstructural analysis such as optical microscopy and Scanning Electron Microscopy (SEM) on the failed part, it found that the fatigue was responsible for the fracture of the flange, which originated from bumps and depressions on the outer surface and propagated by vibration caused by the working condition.

Keywords : failure analysis, 304 stainless steel, fatigue, flange, petrochemical refinery

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