Metadata Details

Title
Fracture and Fatigue Studies on Mild and Structural Steels for use in Antarctica.

Science Keywords

Category	Solid Earth
Topic	Platform Characteristics
Expedition Year	1985-1986
ISO Topic	Meteorology

Summary

Abstract
This study was intended to determine the usability of ordinary mild and structural steels in the Antarctic climatic conditions. An attempt was made to improve the fatigue and fracture toughness characteristics of such metals for the above use. The effect of hydrogen removal on the Kpop-in value and the resulting fatigue crack growth rate and fatigue life of the metal specimen has been studied. An improvement in pop-in characteristics has been indicated.
Purpose
Many special alloys have been prescribed for and used in such low temperatures as are prevalent in the Antarctic. However, the high cost of these alloys inhibits their extensive use. Actual conditions in the place of use may permit the use of ordinary mild steels and structural steels. This makes it important to judge their suitability for such environs. This study assesses the fracture toughness and fatigue crack growth rate of mild and structural steels exposed to the Antarctic climatic cycle. Hydrogen in steel causes flaking and embrittlement. The effect of hydrogen removal is studied.

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