

## Fatigue crack growth rate of a low carbon microalloyed steel for elevated temperature application

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### Abstract

The operating temperature influence on the fatigue crack growth parameter, was analyzed by testing the chromium-molybdenum steel for elevated temperatures application of the new generation additionally alloyed with vanadium. The paper presents a comparison of the fatigue threshold value  $\Delta K_{th}$  and the fatigue crack growth rate  $da/dN$  of the specimens cutting from pipe made of virgin steel, tested at room (RT) and operating (HT) temperature of 540 °C. The influence of the notch and crack initiation location, as well as the test temperature values, have a decisive effect on the fatigue threshold values  $\Delta K_{th}$  of the investigated steel.

The macroscopic and microscopic specimens' fracture surfaces are also shown. Obtained results of fatigue crack growth parameter, correspond to the SEM micrographs of fractured surfaces.

**Keywords:** steam pipeline; crack growth rate; fatigue threshold