

## **Determination of some parameters for fatigue life in welded joints using fracture mechanics method**

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### Abstract

In this work, the parameters stress intensity factor (SIF), initial and final crack lengths ( $a_i$  and  $a_f$ ), crack growth parameters ( $C$  and  $m$ ), and fatigue strength (FAT) are investigated. The determination of initial crack length seems to be the most serious factor in fatigue life and strength calculations for welded joints. A fracture mechanics approach was used in these calculations based on SIF which was calculated with the finite element method (FEM). The weld toe crack was determined to be equal to 0.1 mm, whereas the weld root crack's length was varied depending on the degree of the weld penetration. These initial crack length values are applicable for all types of joints which have the same crack phenomenon. As based on the above calculated parameters, the new limits of FAT for new geometries which are not listed yet in recommendations can be calculated according to the current approach .