

## **ASSESSMENT OF FAILURE DEVELOPMENT IN 7075 ALUMINUM ALLOY ON THE BASIS OF DAMAGE PARAMETERS CHANGE DURING THE HIGH-CYCLING FATIGUE**

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The work involved a series of fatigue tests for specimens of 7075 aluminum alloy manufactured from the sheet metal with a thickness of 1, 2, and 3 mm. Based on the results captured, the Wöhler characteristics were developed and fatigue damage development rates were determined serving as damage indicators. These indicators describe a damage development as the sum of the mean and non-elastic deformations measured in the subsequent fatigue cycles. They are described as the deformation factors of fatigue damage and the damage parameter  $D$ , characterizing the dynamics of deformation changes in subsequent cycles. For specimens of all three series, the courses of damage coefficients variation as a function of time were determined and trend lines were elaborated using the exponential curves. Changes in the exponents of these functions, presented as a function of the stress amplitude, give a valuable information on the estimated time of fatigue life. It results from the approximation of this function to zero values and is based on the fatigue course of the samples from the first to the last load cycle. As a consequence, it takes into account all stages of fatigue failure processes, and thus eliminates from the final result errors associated, for example, with the location of defects forming a structural notch in the critical cross-section.