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Acoustic issue at fatigue failure of construction steel with electroerosive processing the surface

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The majority of power mechanisms and designs work while in service in a mode of cyclic loadings. To elements and the materials applied in flying devices are made great demands most on constructive durability and reliability. Many requirements are purposely overestimated for maintenance of maximal reliability of the mechanisms working in conditions of raised speeds and overloads. Existing techniques of research of fatigue failure of materials use the analysis of breaks after destruction or periodic registration of a condition of samples on change of a surface, roentgenograms, mechanical characteristics. The method of acoustic issue is hardly probable not a unique method of research kinetics process of accumulation of damages to a loaded material.

Many details of planes are made by electroerosive processing. The demanded roughness of a surface of a received detail is in inverse relationship from time spent for manufacture. The present work is devoted to research of acoustic issue at cyclic stressing samples of construction steel, received by an electroerosive cutting. Flat samples for a sign-variable bend were made on copy needling the electroerosive equipment at various capacity of spark processing. The processed samples had a various roughness and structural changes of a superficial layer. Registration of acoustic issue during cyclic stressing has allowed to reveal stages of accumulation of the damages connected with dislocation by reorganization. On character of acoustic issue it is possible to define the moments of "dump of energy", describing origin about growing micro cracks, and also formation of the main crack before destruction. Distinction on energy of process of destruction that characterizes a relaxation of various pressure on a level, arisen in superficial layers at processing a material, and also local concentration of pressure on microroughnesses is observed.

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