Influence of Exposure Duration on Impulse Material fracture

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Analysis of the process of impulse destruction revealed a determining effect on its development of the potential energy stored in the material. Existance Time of stress state is introduced as material parameter characterizing process temporality and material response to pulse action. The general dependence of destructive loads on the duration of the impact in the brittle fracture mode characteristic of high-speed loading was revealed. Transition to brittle mode of destruction of highly plastic polymer films at high-speed loading by magnetic pulse method of creation of controlled pressure pulses, confirming results of analytical evaluations, is experimentally demonstrated. The individuality of the behavior of materials is determined by their static strength and Existance Time of stress state. The work was supported by State Atomic Energy Corporation Rosatom and Ministry of Science and Higher Education of Russian Federation under Federal Project 3 (FP3), project FSEG-2025-0005 "Development of design and technological solutions to ensure mechanical strength and cooling of the central solenoid of tokamak TRT"