
Determination of the mechanical characteristics of the subliming thermal protective coating for rocket and space technology

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Thermal protective coatings are used in rocket and space technology to ensure reliable operation of the structure in a specified temperature range. One method for implementing heat-shielding is the ablation method, based on the destruction of the thermal protective coating simultaneously with heat removal. Closed JSC Experimental Machinery Plant “RSC Energia” is the only enterprise in the country manufacturing thermal protection for manned spacecraft. The enterprise is currently working on the creation of new promising spacecraft for manned interplanetary flights, where thermal protection is one of the main constituent parts of the design. When creating a technology for the rocket and space equipment production due to technology multivariance it is necessary for individual structural elements to possess the best physical and mechanical properties. Here the results of experiments to determine the mechanical characteristics of the fluorolon: the ultimate strength and ultimate elongation are presented. Based on the results of the experiments, relationships for the stresses and strains are constructed. The values of the tensile strength of 23.1 MPa and the ultimate elongation of 57.5% are obtained. It should be noted that significant elongation of the samples is characterizing the plasticity of the fluorolon. Therewith the strength of the material is higher than the assumed design values. These results will be useful in the technological preparation of the production of thermal protective coatings for rocket and space technology.

Keywords: *subliming thermal protective coating, ablation method, thermal protection, mechanical characteristics, composite materials*

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