

# Ground tests of capillary phase separators based on combined porous mesh material for fuel tanks of liquid propellant engine in propulsion installations of space crafts, top steps of carrier rockets and upper-stage rockets

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*The paper describes conditions and methods used to conduct ground tests of some intratank devices applying the so-called capillary phase separators (KFR), which provide multiple starts of liquid-propellant engines under the conditions of an approximate weightlessness. It is shown that the ground tests should be based on the unit of small-scale physical modeling, with that the similarity theory of hydrodynamic processes and dimensional analysis are used. It is necessary to install special stands and experimental facilities for reconstructing the conditions of the free and perturbed orbital (suborbital) flight. The authors determine some correlations, which can be used for providing conditions of an approximate similarity to intratank hydrodynamic processes that accompany the operation of KFR. The schemes of the main stands and experimental setups are given. They provide an opportunity to simulate the conditions of the free and perturbed orbital (suborbital) flight during the ground tests of KFR.*

**Keywords:** liquid-propellant engine, multiple starts in weightlessness, intratank device, capillary phase separator, ground tests.

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