

## ONSET OF CONVECTIVE BURNING IN THE PRESSED CHARGES OF 5/7 PYROXYLIN PROPELLANT GRAINS

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**Abstract:** The conditions of the onset of convective burning in the pressed from the 5/7 propellant particles and particles 5/7, inhibited by polyvinyl butyral, of the samples with porosity from 8% to 15% were determined. The investigations were carried out in the constant-volume bomb and in model rocket engine. The influence of the pressure amplitude generated by the igniter and of the pressure rise rate were studied in the constant-volume bomb. It is established that the transition of regular burning into the convective burning occurs at low pressures — 0.3–0.65 MPa. Decreasing the porosity and coating granules by the film of polymer increase the time of regular burning. The possibility of the appearance of convective burning with the development of regular burning at decreasing pressure is shown. Under the pulse action of igniter products in the model rocket engine, the convective burning in the most of experiments appears at the stage of igniter burning. Onset of convective burning is determined not only by the pressure of igniter, but also by the time of pressure rise. The zone of initiation of convective burning at the pressure–time plot was determined for samples with a porosity of 10%.

**Keywords:** propellant; pressure; burning; convective burning; constant-volume bomb; igniter; polyvinyl butyral

### Acknowledgments

The work was supported by the Russian Foundation for Basic Research (project No. 13-03-00294).

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*Received December 29, 2016*

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