

MEASURING OF PRESSURE DISTRIBUTION ON SURFACE OF RE-ENTRY VEHICLE MODEL AT HIGH FLOW VELOCITIES

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In the hypersonic wind tunnel AT-303 of short duration the program of aerodynamic characteristics investigation of the re-entry ballistic vehicle of EXPERT (the European EXPER-imental Re-entry Testbed), developed by the European space agency of ESA was executed. Under this program, the static pressure on the side and bottom surfaces was measured with help of special drainage model equipped with the pressure sensors. In total pressure was measured at 39 points on the model surface, 19 of which were located on the bottom base plate.

The experiments were performed at free stream Mach numbers $M = 7.9$ and 14.25 . In these experiments model angle of attack and the orientation of the drainage point's plane were varied. Distributions of pressure along the model EXPERT were obtained which are comparable with numerical predictions. Unexpected trend of the base pressure on the model base plane with Mach number increasing was experimentally determined.

The present results are of primarily interest to developers of re-entry ballistic demonstrator EXPERT, as well as for professionals involved in the calculations of the flow field around hypersonic vehicles.

Keywords: re-entry ballistic vehicle, hypersonic velocity, pressure distribution