
Enhancing the efficiency of the propellant cooling system using a heat exchanger and antifreeze being cooled by liquid nitrogen

© S.K. Pavlov, V.V. Chugunkov

Bauman Moscow State Technical University, Moscow, 105005, Russia

The article describes the construction of the propellant cooling system using a heat exchanger and the antifreeze being cooled by liquid nitrogen, when the heat exchanger is placed directly in the tank with antifreeze. Cooling is performed by the circulation of propellant from the tank of its location through the heat exchanger placed in the tank with antifreeze being cooled by supplying dispersed liquid nitrogen. We present the cooling system circuit, equations and the results of predicting its efficiency in terms of the relative liquid nitrogen flowrate in comparison with other variants of propellant cooling on the space launcher complexes.

Keywords: propellants, temperature preparation, cooling, heat exchanger, antifreeze, liquid nitrogen, cooling efficiency.

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Chugunkov V.V. (b. 1950) graduated from Bauman Moscow Higher Technical School in 1973. Dr. Sci. (Eng.), Professor of Rocket Launching Complexes Department at Bauman Moscow State Technical University. Author of 130 publications in the field of heat-mass-transfer in aggregates and systems of launching complexes.
e-mail: sm8@sm8.bmstu.ru

Pavlov S.K. (b. 1991) graduated from Bauman Moscow State Technical University in 2014. Postgraduate student of Rocket Launching Complexes Department at Bauman Moscow State Technical University. e-mail: sm8@sm8.bmstu.ru
