IX Minsk International Seminar "Heat Pipes, Heat Pumps, Refrigerators, Power Sources",
Minsk, Belarus, 07-10 September, 2015

INVESTIGATION OF CHARACTERISTICS OF HEAT PIPES FOR LED LIGHTNING DEVICE

S. M. Khairnasov, Yu. E.Nikolaenko, B. M. Rassamakin, M. A. Lozovoi
Heat Pipes Laboratory, Heat and Power Department, National Technical University of Ukraine "KPI"
Ukraine, 03056, Kyiv-56, Prospect Peremohy, 37
Tel/fax (044)454-95-26; E-mail: yunikola@ukr.net; sergey.khairnasov@gmail.com

Abstract

The tests results of the aluminium grooved heat pipes characteristics are presented. Two aluminium grooved heat pipes were designed for a forced air cooling of high-power LED lighting device and used ammonia as a work fluid. Evaporated zone temperature of the heat pipe was in the range of 31.0 to 52.5 °C at the heat flux range of 50 to 100 W and upcoming flow speed range of 0.8 to 2.1 m/s. The temperature difference along the heat pipes was 0.9…1.7 °C at the heat flux 50 W and 1.7…3.1°C at the heat flux 100 W. The thermal resistance of heat pipes was in the range of 0.012 to 0.044 °C/W. The main factors which influence of heat pipes performance are: the heat flux value, the speed of cooling air flux, heat pipe inclination angle relative to the horizon.