



APPLICATION OF CAST POROUS METALS AS MICROCAPILLARY HEAT TUBES

Purposes and implication

Heat tubes possess high thermal conductivity. Research shows that the use of ammonia as a thermal conductor at a room temperature in heat tube with diameter 1 sm and length 1 m exceeds thermal conductivity of a copper rod with the same size as much as 1000 times. With the equal temperature difference heat tube transfers heat 1000 times as much as copper rod. It is recommended to make heat tubes of copper cast porous capillary materials that can serve as powerful heat sink in electronics.

Major characteristics of thermal conductivity of capillary materials

Thermal conductivity of capillary materials is affected by not only heat transfer agent but also thermal capacity of a tube. The influence of thermal capacity ratio, type of a thermal conductor, pore orientation in copper capillary materials on thermal conductivity is 200-400 times as much as in monolith samples.

Intellectual property rights protection

Patent №103602 for the utility model is registered in Ukraine. Results of the research are tested in TMM "Energobud"

Market demand

The developed porous material is highly demanded in modern electronics for producing small and powerful heat sinks for power elements. It allows to significantly improve their work conditions and reduce equipment size. If used in PC, the size of heat sink in processor together with working temperature will reduce.

Стан готовності розробки

Pilot samples of capillary materials with alcohol as working fluid have significantly higher thermal conductivity that is 280-340 times as high as monolith copper samples of the same size.

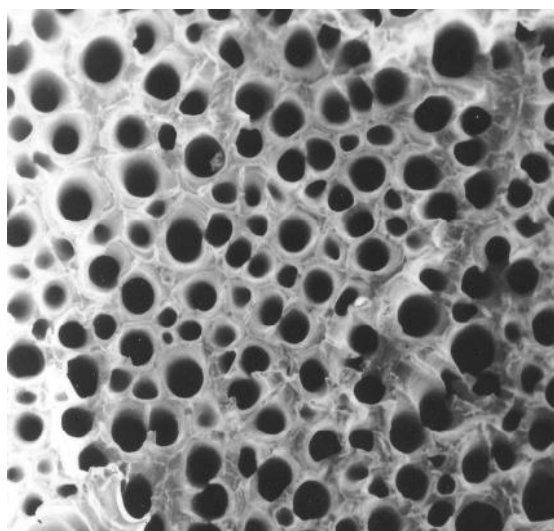


Photo of pores in cast porous metal which is used as a heat tube in efficient heat sink