Patent Search

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Abstract:

The present invention relates to a corrugated plate fin heat sink, comprising: a base plate attached to the source of heat on one side; plate-fins normal to base plate and p to each other that are placed at a predefined pitch length; plate-fins having repeated semi-circular corrugations. wherein the plate-fin heat sink geometry is having a base 160 mm×160 mm dimension. The plate-fins, 0.6 mm thick, 160 mm length, and 80 mm high, are joined to the base plate by brazing operation. The plate-fins are separatec pitch length of 16 mm. The corrugated plated fins have semi-circular corrugations of 5 mm and 10 mm diameters whose pitch is varied from the range of 10 mm-25 mm. T corrugated plate-fin heat sink that is employed for cooling of hot surfaces in a variety of machine components and electronic cooling applications. The application of corru plate-fin heat sink of the present invention showed a substantial improvement in thermo-hydraulic performance than that of a smooth plate-fin heat sink

Complete Specification

The present invention relates generally to a heat sink, and more specifically, to a corrugated plate fin heat sink having improved thermo hydraulic performance that is employed for cooling of hot surfaces in a variety of machine components and electronic cooling applications.

BACKGROUND OF THE INVENTION

[0002] The energy-consuming operations are associated with the formation of a quantum of heat within the systems. The heat energy should be dissipated to the surroundings at a specific rate to keep the temperature of the system within permissible limits. Heat sinks were introduced a way back to dissipate the heat energy at a faster rate from the system to the surrounding fluid medium. The thermal performance of heat sink mainly depends on the fin geometry, fin material, and the convectio coefficient. The design of the fin is important as it helps to make portable and cost-effective heat sinks that are capable of dissipating heat efficiently. The selection of correct fin geometry can contribute immensely to enhance the heat transfer from the heat sink. The heat dissipation from the fin surface to the adjacent fluid is a strong function of the boundary layer flow over the fin profile, which is affected by the fluid velocity and the fluid properties, and the fin area exposed to the flow.

[0003] The optimal fin configuration to increase the convective heat transfer through the fin is suggested in several studies. Since the shape of the plate-fin or pin fin contributes immensely to the heat transfer enhancement, the effects of thickness, height, and spacing of fins plate-fin heat sink are investigated in the literature. The sha of the fins is designed in such a way that air mixing and turbulence may increase and ultimately resulting in enhancement of the heat transfer. A vortex generator is usec researchers to increase the turbulence in the flow before entering the heat sink.

[0004] WO2011105364A1 discloses a light-weight, low-cost and high-performance heat sink requiring less machining and capable of better heat dissipation performance

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