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Heat Transfer Improvement of a Thermal Interface Material for Heat Sink Applications Using Carbon Nanomaterials

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A functional material of carbon nano-composite is investigated to be utilised as a Thermal Interface Material (TIM) in the Low Voltage Power Supply (LVPS) bricks as part of the upgrade of the large Hardron Collider (LHC) accelerator at CERN. The TIM is a composite in a pasty form, based on carbon nanomaterials (CNMs) and Silicone heat transfer compound. The goal behind the implementation of the carbon nano-material in the TIM was to increase the thermal transfer from the electronics to the heat sink by the intermediary of the aluminium oxide (Al_2O_3) posts. The temperature of the thermal posts was aquired by the means of an automated test stand built in house and monitored hourly with a Labview interface. The composite of CNMs and silicone compound were dissolved in acetone, then annealed at high temperatures in atmospheric air in order to achieve a homogeneous mixture. The CNMs investigated in this research work are Carbon Nanotubes (CNTs) and Carbon Nanospheres (CNSs) which were synthesised by Chemical Vapor Deposition. Also, the study included the investigation of the weighting of the CNMs in the nano-composite.

Apply to be considered for a student ; award (Yes / No)?

yes

Level for award;(Hons, MSc, PhD, N/A)?

PhD

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