Comparison Analysis of Cooling Fluid Variations Mineral Oil And Virgin Coconut Oil (VCO) to Immersion Cooling Performance of Central Processing Unit

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ABSTRACT

Conventional cooling methods are not enough to compensate for the heat generated by the CPU when used for a long period of time. This study discusses the analysis of immersion cooling performance for the CPU with cooling fluids variations. The purpose of this study is to find out the best cooling fluid in immersion cooling method to decrease the CPU temperature. The research method used is an experimental method. Computers with conventional cooling are designed to be immersion cooling. The motherboard is immersed in an aquarium containing dielectric fluid. The dielectric liquids used are Mineral Oil and Virgin Coconut Oil (VCO). Submersible pumps are used to circulate the dielectric fluid from the aquarium through the radiator, then re-enter the aquarium. Inlet and outlet temperature data retrieval using digital thermometer measuring instruments. Meanwhile, for CPU temperature data retrieval using HW Monitor software. Data retrieval is done for 24 hours. Every 3 hours the measuring instrument records the inlet temperature, outlet and CPU temperature. The test results showed that immersion cooling method is better than conventional cooling method. CPU temperature using conventional cooling is 71°C while using immersion cooling is 42°C. Immersion cooling performance with VCO cooling fluid is better than immersion cooling with mineral oil cooling fluid. This is showed by the maximum CPU temperature produced when using VCO is only 42°C. This temperature is lower compared to Mineral Oil which is 56°C. Maximum temperature of inlet and outlets of VCO is 37.5°C and 36.8°C while Mineral Oil is 33.2°C and 32.6°C

Keywords*: Immersion cooling, dielectric fluid, mineral oil, virgin coconut oil, immersion cooling performance.*