

Ferro-fluid Based Liquid Cooling System

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| Laboratory Name | CSIR- Central Scientific Instruments Organisation, Chandigarh |
| Brief Profile of Technology/Product | <p>Ferro-fluid based smart miniature cooling system is a cooling device which utilizes heat and magnetic field to dissipate heat from the circuit or heat source. Traditional devices have certain limitations in terms of heat, vibration, noise and at the same time they require power from working system to dissipate heat. The developed system is a passive system uses two different liquid cooling systems having carrier fluid as water and kerosene. The product makes use of high heat transfer coefficient and natural circulation caused by the magnetic pump of Ferro-fluid so as to constitute a high performance cooling device which is noiseless and without mechanical moving elements thus having high reliability. The heat transfer can be scaled depending upon the heat load and space constraints.</p> |
| Returns/Benefits | <p>The system can be used for passive heat transfer applications at different stages, e.g., Electronic passive cooling, Computer passive cooling, Customized Miniature cooling, etc.</p> <p>Features:</p> <ul style="list-style-type: none"> • Removal of heat using heat transfer coefficient & thermal conductivity of fluid • True 100% passive cooling system • Virtual magnetic pump (Magnet) • Efficient for Miniaturized Systems or Microsystems • Less weight and aesthetic looks • Less components |
| Validation Level | <p>Presently the system has been integrated with Computer & its performance has been excellent.</p> |
| IPR Status [also indicating the status of the patent (if any) in 2015] | <p>Patent filed; Patent No: 2707DEL2014 on Ferro-fluid based liquid cooling system</p> |
| End product price (if not available, estimated price) | <p>Rs 5000/- approximately</p> |
| Technology/Product Collaborator | <p>Discussions with 3 companies/firms in progress.</p> |

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| <p>Relevance of Technology in present times</p> | <p>There is no such technology of this type.</p> <p>Specifications:</p> <p>Working range (Flux) : 50-100W/cm²</p> <p>Operating temperature : 45-90°C</p> <p>Size (customized) : 101.6x63.5x25.4mm</p> <p>Material : Copper and Aluminum</p> <p>Weight : 400-500gm</p> <p>Flow rate : 10-18ml/min</p> <p>Magnet : Permanent</p> |
| <p>Similar technology/product developed</p> | <p>Ferro-fluid cooling system is the first such kind of the system</p> |
| <p>Picture of the technology/product (if any, with good resolution)</p> | <div data-bbox="808 674 1284 1220" data-label="Image"> </div> <p>Ferro-fluid based liquid cooling systems installed on a Computer Processor for cooling</p> |