Development of Nanofluids for improved heat transfer technology

- Scheda
- Approfondimenti

Identificativo proposta:TOUK20190918003 **RICHIEDI MAGGIORI INFORMAZIONI**

UK based research organisation looking to develop its Nanofluids for improved heat transfer technology by expanding in to new markets and sectors. The collaboration would be via a licensing or research agreement with the aim of developing the use of nanofluids to improve the cooling of surfaces within fusion reactors that are exposed to extreme heat-fluxes.

A research organisation based in the UK is looking to develop their Nanofluids for improved heat transfer technology in to new markets and sectors. This would be via a licensing agreement developing the use of nanofluids to improve the cooling of surfaces within fusion reactors that are exposed to extreme heat-fluxes. Nanofluids are suspensions of nanoparticles within a fluid. The nanoparticles are typically less than 100nm and are usually diluted within water at a concentration of less than 1%. From previous investigations nanofluids have been found to enhance properties such as thermal conductivity, viscosity, and convective heat transfer co-efficients when compared to base fluids such water or oil. Nanoparticles being investigated for nuclear fusion applications include: alumina, ceramics, and carbon nanotubes, as these are known to increase both the conductive and convective heat transfer coefficients by up to half an order of magnitude (5x), and to increase of critical heat flux of current coolants for boiling heat transfer by up to an order of magnitude (10x). Two collaborative research projects are currently underway within the nuclear fusion industry to further understand the physics leading to the increased heat transfer rates. As nuclear fusion involves an extremely harsh environment, it can provide a highly robust technology that can be transferred into other industries to develop competitive advantages. In parallel, an experimental rig has been constructed with the aim of measuring the long-term effects of nanofluid flows inside a fusion-relevant heat exchanger. Nanoparticle quality, settling and surface erosion are also being assessed to determine the long-term effects that may be incurred by the system. Initially developed for fusion to improve the convective cooling of the high heat flux HyperVapotrons. Nanofluids have the potential to enhance any application that uses water or oil-based convective cooling such as but not limited to automotive, electronics, semiconductors, medical, nuclear, aerospace, heat exchangers or Gas turbines

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