

Fluid Flow and Heat Transfer Characteristics Investigation in Spray Cooling Systems Using Nanofluids

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Abstract : This paper aims to investigate the heat transfer and fluid flow characteristics of nanofluids used in spray cooling systems. The effect of spray height, type of nanofluids and concentration of nanofluids are numerically investigated. Five different nanofluids such as AgH₂O, Al₂O₃, CuO, SiO₂ and TiO₂ with volume fraction range of 0.5% to 2.5% are used. The results revealed that the heat transfer performance decreases as spray height increases. It is found that TiO₂ has the highest transfer coefficient among other nanofluids. In dilute spray conditions, low concentration of nanofluids is observed to be more effective in heat removal in a spray cooling system.

Keywords : numerical investigation, spray cooling, heat transfer, nanofluids

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