

Performance Evaluation of Heat Transfer Rate in Automobile Radiator Using Nanoparticles

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ABSTRACT

Continuous technological development in automobile industries has increased the demand for high efficiency engines. A high efficiency engine is not only based on its performance but also for better fuel economy and less emission. Reducing a vehicle weight by optimizing design and size of a radiator is a necessity for making the world green. There are several different approaches and any one of these can take to optimize the heat transfer performance of radiator design.

These include:

- Changing the fin design,
- Changing the tube type,
- Changing the flow arrangement,
- Changing the fin and tube material,
- Changing the fluid.

Heat transfer fluids have inherently low thermal conductivity that greatly limits the heat exchange efficiency. While the effectiveness of extending surfaces and redesigning heat exchange equipment to increase the heat transfer rate has reached a limit, many researchers made an attempt to improve the thermal transport properties of the fluids by adding more thermally conductive solids into liquids. Liquid dispersions of nanoparticles, which have been termed “nanofluids”, exhibit substantially higher thermal conductivities than those of the corresponding base fluids.

In dissertation work using four stroke four cylinder engine as a experimental set up. In this project, different proportions of Al_2O_3 nanoparticles by weight have been added to conventional fluid (water), and based on that the enhancement in heat transfer rate has been found out by taking readings & calculating heat transfer rate.