

ABSTRAK

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Program Studi : Fisika

Judul Skripsi : Rancang Bangun *Double Pipe Heat Exchanger* dan Radiaotor Mobil sebagai Alat Pendingin Mesin Menggunakan *Ethylene Glycol*-Air sebagai Fluida

Pada penelitian ini telah dilakukan perancangan dan pembuatan alat yang terdiri dari *double pipe heat exchanger* dan radiator mobil 1300 cc sebagai pengganti alternatif alat sistem pendingin. Dilaporkan bahwa terjadi proses *heat transfer* dari *double pipe heat exchanger* dan radiator menggunakan *ethylene glycol*-air sebagai fluida. Penelitian dilakukan dengan variasi laju aliran 11 liter/menit, 10 liter/menit dan 9 liter/menit dengan T_{in} 50°C- 90°C pada *double pipe heat exchanger* sedangkan T_{in} radiator merupakan T_{out} *double pipe heat exchanger*. Dari hasil pengujian didapatkan nilai rata-rata *overall heat transfer coefficient* pada *double pipe heat exchanger* sebesar 401,92 (W/m².K). Sedangkan nilai rata-rata *overall heat transfer coefficient* pada radiator sebesar 42,07 (W/m².K). Dalam hal ini alat sistem pendingin dapat memanfaatkan proses *heat transfer* untuk menurunkan suhu *ethylene glycol*-air 3000 ml hingga 6,6°C pada *double pipe heat exchanger* dan 2000 ml hingga 1,7°C.

Kata kunci: *double pipe heat exchanger*, radiator, *heat transfer*, *Ethylene glycol*-air, *Overall heat coefficient*,

ABSTRACT

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Judul Skripsi : Manufacture of Double pipe heat exchanger and radiator
car as engine cooling device using Ethylene Glycol-Air as a Fluid

In this research, the design and manufacture of a tool consisting of a double pipe heat exchanger and a 1300 cc car radiator has been carried out as an alternative to the cooling system. It was reported that there was a heat transfer process from double pipe heat exchangers and radiators using ethylene glycol-water as the fluid. The research was carried out by varying the flow rate of 11 liters / minute, 10 liters / minute and 9 liters / minute with Thin 50 ° C- 90 ° C on a double pipe heat exchanger while the Thin radiator is a Thout double pipe heat exchanger. From the test results, it was found that the overall heat transfer coefficient value on the double pipe heat exchanger was 401.92 (W / m².K). Meanwhile, the average overall heat transfer coefficient on the radiator is 42.07 (W / m².K). In this case the cooling system tool can take advantage of the heat transfer process to reduce the ethylene glycol-water temperature of 3000 ml to 6.6 ° C in double pipe heat exchangers and 2000 ml to 1.7 ° C.

Keywords: Double pipe heat exchanger, Radiator, Heat transfer, Ethylene glycol-water, Overall heat coefficient,