

## ABSTRAK

Tujuan dalam penelitian ini adalah: (a) membuat mesin AC mobil yang bekerja dengan siklus kompresi uap (b) Mengetahui karakteristik mesin AC mobil yang telah dibuat meliputi kalor yang diserap evaporator persatuan massa refrigeran, kalor yang dilepas kondensor persatuan massa refrigeran, kerja kompresor persatuan massa refrigeran, COP aktual dan COP ideal, efisiensi mesin AC mobil, dan laju aliran massa refrigerant.

Penelitian dilakukan dengan metode eksperimental yang dilakukan di laboratorium Teknik Mesin Fakultas Sains dan Teknologi Universitas Sanata Dharma. Mesin AC mobil yang diteliti mempergunakan siklus kompresi uap, dengan daya penggerak motor listrik 2 hp, (sebagai pengganti motor bakar) daya putaran 888rpm, *refrigerant* : R-134a, dimensi kabin : 1,5 m x 1,2 m x 1 m, kabin terbuat dari kayu triplek dengan tebal 3,5 mm dan pada saat penelitian kabin di buat kosong (tidak berbeban pendingin).

Hasil penelitian memberikan kesimpulan : (a) Kerja kompresor per satuan massa *refrigerant* rata-rata sebesar 52,68 kJ/kg, (b) Kalor per satuan massa *refrigerant* yang diserap evaporator rata-rata sebesar 161,10 kJ/kg, (c) Kalor per satuan massa *refrigerant* yang dilepas kondensor rata-rata sebesar 213,78 kJ/kg, (d) COP<sub>aktual</sub> mesin AC mobil rata-rata sebesar 3,06, (e) COP<sub>ideal</sub> mesin AC mobil rata-rata sebesar 6,19, (f) Efisiensi mesin AC mobil rata-rata sebesar 49,43%, (g) Laju aliran massa terendah adalah 0,02 kg/s, tertinggi sebesar 0,02 kg/s, rata-rata sebesar 0,02 kg/s.

## ABSTRACT

The purpose of this research are: (a) assemble engine car air conditioner that works with the vapor compression cycle (b) Knowing the characteristics of the air conditioner cars that have been made include heat in the absorption evaporator unity mass of refrigerant, heat is released condenser unity mass of refrigerant, compressor refrigerant mass unity, the actual COP and COP ideal, car air-conditioning machine efficiency, and the mass flow rate of refrigerant.

The study was conducted by experiments conducted in the laboratory of Mechanical Engineering, Faculty of Science and Technology of the University of Sanata Dharma. AC engine cars are researched using the vapor compression cycle, with the driving force of the electric motor 2 hp, (in lieu of motor fuel) power rotation 888rpm, refrigerant R-134a, cabin dimensions: 1.5 mx 1.2 mx 1 m, the cabin is made of plywood with a thickness of 3.5 mm and when the study was made empty cabin (no cooling load).

The results of the study provide conclusions: (a) Work per unit mass of refrigerant compressors average of 52.68 kJ / kg, (b) The heat per unit mass evaporator refrigerant absorbed an average of 161.10 kJ / kg, (c) of heat per unit mass of refrigerant condensers released an average of 213.78 kJ / kg, (d) COPaktual conditioned car engine by an average of 3.06, (e) COPideal conditioned car engine by an average of 6.19, ( f) The efficiency of the air conditioner cars by an average of 49.43%, (g) the lowest mass flow rate is 0.02 kg / s, the highest of 0.02 kg / s, an average of 0.02 kg / s.