ABSTRAK

Widiono, I. (2015). *Kulkas 2 Pintu Panjang Pipa Kapiler 170 dengan Refrigeran R134a dan Berdaya 1/8 PK*. Skripsi. Yogyakarta: Universitas Sanata Dharma.

Saat ini mesin pendingin sangat penting dalam kehidupan sehari-hari terutama di daerah beriklim tropis khususnya Indonesia. Mesin pendingin dapat digunakan untuk pengkondisian udara ataupun mendinginkan bahan makanan dan minuman. Mengingat peran dan pentingnya mesin pendingin secara umum, maka diperlukan pengetahuan tentang pembuatan dan pengembangan mesin pendingin.

Pembuatan mesin pendingin menggunakan kompresor yang menggunakan listrik sebagai energi penggeraknya, evaporator, kondensor, pipa kapiler. Mesin pendingin menggunakan siklus kompresi uap. Pembuatan mesin pendingin kulkas dua pintu sama seperti yang ada di pasaran dengan menggunakan daya kompresor 1/8 Pk, dan menggunakan refrigeran R134a.

Pengujian mesin pendingin berjalan dengan baik dengan beban air sebanyak 600 ml. Kisaran suhu kerja evaporator mencapai -19 ^{0}C dan suhu kerja kondensor sebesar 41,3 ^{0}C. Kerja kompresor (W_{in}) terendah sebesar 49kJ/kg dan tertinggi sebesar 54 kJ/kg. Energi kalor yang diserap evaporator (Q_{in}) terendah sebesar 169 kJ/kg dan tertinggi sebesar 182 kJ/kg. Energi kalor yang dilepas kondensor (Q_{out}) terendah sebesar 221 kJ/kg dan tertinggi sebesar 232 kJ/kg. COP_{aktual} terendah sebesar 3,18 dan tertinggi sebesar 3,71. COP_{ideal} terendah sebesar 4,07 dan tertinggi sebesar 4,39. Efisiensi terendah sebesar 77,43% dan tertinggi sebesar 87,91%, serta laju aliran massa terendah sebesar 0,00252 kg/detik dan tertinggi sebesar 0,00278 kg/detik.

Kata Kunci : mesin pendingin, siklus kompresi uap, COP_{aktual}, COP_{ideal}, efisiensi, laju aliran massa.

ABSTRACT

Widiono, I. (2015). *Two Door Refrigerator 170 cm Long Capillary Tubes With Refrigerant R134a AND 1/8 PK Power*. Thesis. Yogyakarta: Sanata Dharma University.

Now a days refrigerator is very important in everyday life, especially in tropical areas, such as in Indonesia. Refrigerator can be used for air conditioning or cooling food and drinks. Because of the role and importance of refrigeration in general, the knowledge of the manufacturing and development of refrigeration becomes important.

Refrigerator manufacturing used electrically powered compressor, evaporator, condenser, and capillary tube. The refrigerator itself used vapor compression cycle. Two-door refrigerator manufacturing went through the same process as the refrigerators that are widely sold in the market by using a 1/8 Pk compressor power, and used R134a refrigerant.

The refrigerator testing process went well with 600 ml water load. The range of the evaporator working temperature reached -19 ^{0}C and the condenser working temperature reached 41.3 ^{0}C. The lowest compressor level (W_{in}) was 49 kJ / kg and the highest was 54 kJ / kg. The heat energy absorbed by the evaporator (Q_{in}) reached the lowest level at 169 kJ / kg and the highest was 182 kJ / kg. Condenser heat energy released (Q_{out}) reached the lowest point at 221 kJ / kg and the highest was 232 kJ / kg. The lowest COP_{actual} was at 3.18 and the highest was 3.71. The lowest COP_{ideal} level was at 4.07 and the highest was 4.39. The lowest efficiency level was at 77.43% and the highest was 87.91%, and the lowest mass flow rate level was at 0.00252 kg / sec and the highest at 0.00278 kg / sec.

Keywords: refrigerator, the vapor compression cycle, COP_{actual}, COP_{ideal}, efficiency, mass flow rate.