

## INTISARI

Penggunaan mesin pendingin pada saat ini memiliki peranan yang cukup besar bagi kehidupan masyarakat. Pada bidang medis mesin pendingin jenazah digunakan untuk menjaga kondisi jenazah agar tidak mengalami proses pembusukan yang diakibatkan oleh bakteri dan mikroorganisme. Tujuan dari penelitian mengenai karakteristik mesin pendingin jenazah ini adalah : (a) Merakit mesin pengkondisian jenazah. (b) Mengetahui karakteristik mesin pengkondisian jenazah yang telah dibuat meliputi : besar kalor persatuan massa refrigeran yang dilepas kondensor ( $Q_{out}$ ), besar kalor persatuan massa refrigeran yang diserap evaporator ( $Q_{in}$ ), besar kerja yang dilakukan kompresor persatuan massa refrigeran ( $W_{in}$ ), COP aktual (*Coefficient of Performance*), COP ideal (*Coefficient of Performance*) dan Efisiensi mesin pengkondisian jenazah.

Mesin pendingin jenazah ini merupakan mesin yang bekerja dengan siklus kompresi uap. Komponen utama dari siklus kompresi uap meliputi: evaporator, kompresor, kondensor dan pipa kapiler. Daya kompresor yang digunakan adalah 1/5HP, dengan menggunakan dua kali sistem pendinginan yang disusun secara seri, komponen utama lainnya yang digunakan menyesuaikan dengan besar daya kompresor. Refrigeran yang digunakan adalah refrigeran R-134a. Terdapat dua jenis pembebanan yang berbeda yaitu dengan 60 kg air dan tanpa beban pendinginan.

Hasil penelitian memberikan kesimpulan. (a) mesin pendingin jenazah dapat bekerja dengan baik, (b) Karakteristik yang didapat pada mesin pendingin jenazah pada penelitian ini sebagai berikut : Pada variasi tiga kipas pendingin kondensor tanpa beban selama 120 menit menghasilkan  $COP_{aktual}$  rata – rata sebesar 5,09.  $COP_{ideal}$  rata – rata sebesar 7,02 dan efisiensi rata – rata sebesar 72,71%. Pada variasi empat kipas pendingin kondensor tanpa beban selama 120 menit menghasilkan  $COP_{aktual}$  rata – rata sebesar 5,40,  $COP_{ideal}$  rata – rata sebesar 7,36 dan efisiensi rata – rata sebesar 73,42%. Sedangkan Pada variasi tiga kipas pendingin kondensor dengan beban 60 kg air selama 360 menit menghasilkan  $COP_{aktual}$  rata – rata sebesar 4,65,  $COP_{ideal}$  rata – rata sebesar 6,85 dan efisiensi rata – rata sebesar 67,83 %. Pada variasi empat kipas pendingin kondensor dengan beban 60 kg air selama 360 menit menghasilkan  $COP_{aktual}$  rata – rata sebesar 4,86,  $COP_{ideal}$  rata – rata sebesar 7,01 dan Efisiensi rata – rata sebesar 69,44%.

Kata kunci:  $COP_{aktual}$ ,  $COP_{ideal}$ , Efisiensi refrigeran, jenazah, siklus kompresi uap.

## ABSTRACT

The use of cooling machines at this time has a big enough role for people's lives. In the medical field the cooling machine is used to maintain the condition of the corpse so as not to experience the process of decay caused by bacteria and microorganisms. The research objective of this mortuary refrigerator are : (a) assembling a mortuary refrigerator. (b) knowing the characteristics of the mortuary refrigerator that has been assembled include : the heat which was transferred to the environment by condenser for each refrigerant mass ( $Q_{out}$ ), the heat which was absorbed by evaporator for each refrigerant mass ( $Q_{in}$ ), the work of the compressor for each mass of refrigerant ( $W_{in}$ ), the Actual Coefficient of Performance ( $COP_{actual}$ ) of mortuary refrigerator, the Ideal Coefficient of Performance ( $COP_{ideal}$ ) of the mortuary refrigerator and the efficiency of the mortuary refrigerator.

The mortuary refrigerator is a cooling machine that using vapor compression cycle. The main component of vapor compression cycle are : compressor, condenser, evaporator, filter, and capillary pipe. The compressor power is 1/5 HP, using two series of colling systems and the other main component size adjusts to the power of the compressor. Refrigerant that used is refrigerant R-134a. There are two different types of loading that is with a load of 60 kg of water and without the colling load.

The result of the research provide a conclusion. (a) The mortuary refrigerator works well, (b) Characteristics of the mortuary refrigerator in this research resulted in the following data : in the three variations of cooling fan condenser without load for 120 minutes produce  $COP_{actual}$  average as big as 5,09,  $COP_{ideal}$  average as big as 7,02 and efficiency average as big as 73,32%. In the four variations of cooling fan condenser without load for 120 minutes produce  $COP_{actual}$  average as big as 5,40,  $COP_{ideal}$  average as big as 7,36 and The efficiency average as big as 73,42%. In the four variations of cooling fan condenser with 60 kg of water load for 360 minutes produce  $COP_{actual}$  average as big as 4,65,  $COP_{ideal}$  average as big as 6,85 and efficiency average as big as 67,83%. In the three variations of cooling fan condenser with 60 kg of water load for 360 minutes produce  $COP_{actual}$  average as big as 4,86,  $COP_{ideal}$  average as big as 7,01 and efficiency average as big as 69,44%

Keywords :  $COP_{aktual}$ ,  $COP_{ideal}$ , Efficiency refrigerant, mortuary, vapor compression cycle.