INTISARI

Indonesia merupakan negara beriklim tropis, sehingga mesin pendingin banyak digunakan dalam kehidupan sehari-hari. Hampir di setiap tempat, banyak di temukan mesin-mesin pendingin. Mesin pendingin siklus kompresi uap adalah mesin pendingin yang di dalamnya terjadi siklus dari bahan pendingin (refrigeran) sehingga menghasilkan perubahan panas dan tekanan. Tujuan penelitian ini adalah a) Membuat *chest freezer* yang bekerja dengan siklus kompresi uap. b) Mengetahui karakteristik *chest freezer* meliputi COP_{aktual} dan COP_{ideal} *chest freezer*, kerja kompresor, kalor yang diserap evaporator per satuan massa., kalor yang dilepas kondensor per satuan massa., efisiensi dan laju aliran massa dari mesin pendingin

Metode yang digunakan adalah dengan metode eksperimental. Beban pendingin dipilih air 240 ml di dalam ruang pendingin. Lalu proses pengambilan data dilakukan pada mesin pendingin selama 150 menit. Setelah pengambilan data pada mesin, lalu data tersebut dianalisis secara teoritis dengan menetukan kondisi refrigeran pada setiap titik siklus, kapasitas refrigerasi dan COP sistem.

Hasil penelitian memberikan kesimpulan Kalor persatuan massa terendah yang dilepas evaporator sebesar 232 kJ/kg, kalor persatuan massa tertinggi yang dilepas evaporator sebesar 273 kJ/kg dan kalor persatuan massa rata-rata yang dilepas evaporator sebesar 256 kJ/kg, COP_{aktual} terendah *chest freezer* sebesar 3.08, COP_{aktual} tertinggi *chest freezer* sebesar 3.3 dan COP_{aktual} rata-rata *chest freezer* sebesar 3.17, COP_{ideal} terendah *chest freezer* sebesar 4,1, COP_{ideal} tertinggi *chest freezer* sebesar 4,2 dan COP_{ideal} rata-rata *chest freezer* sebesar 4,14, Kalor persatuan massa terendah yang dilepas evaporator sebesar 232 kJ/kg, kalor persatuan massa tertinggi yang dilepas evaporator sebesar 273 kJ/kg dan kalor persatuan massa rata-rata yang dilepas evaporator sebesar 256 kJ/kg, COP_{aktual} terendah *chest freezer* sebesar 3.08, COP_{aktual} tertinggi *chest freezer* sebesar 3.3 dan COP_{aktual} rata-rata *chest freezer* sebesar 3.17, COP_{ideal} terendah *chest freezer* sebesar 4,1, COP_{ideal} tertinggi *chest freezer* sebesar 4,2 dan COP_{ideal} rata-rata *chest freezer* sebesar 4,14, Kalor persatuan massa terendah yang diserap evaporator sebesar 179 kJ/kg, kalor persatuan massa tertinggi yang diserap evaporator sebesar 179 kJ/kg dan kalor persatuan massa rata-rata yang diserap evaporator sebesar 179 kJ/kg, Efisiensi terendah *chest freezer* sebesar 75%, efisiensi tertinggi *chest freezer* sebesar 80% dan efisiensi rata-rata *chest freezer* sebesar 77%, Laju aliran massa terendah *chest freezer* adalah 0,0041 kg/s, laju aliran massa tertinggi *chest freezer* sebesar 0,0043 kg/s dan laju aliran massa rata-rata *chest freezer* sebesar 0,00418 kg/s.

Abstract

Indonesia is a country with tropic climate,thus refrigerator has been used in our daily life nowadays. Almost in every places,lots of refrigerator can be found. Steam compression cycle of refrigerator is a refrigerator which the inside of it,happens a cycle from the matter of refrigerator (refrigerant) the result with that cycle create changing of heat and pressure.The purpose of this research are a) making chest freezer that works with steam compression cycle. b) understand the characteristic of chest freezer include COP actual and COP ideal chest freezer,compressor works,the heat which been absorbed by evaporator / mass,the heat which been released by the condenser / mass,the efficiency and flow speed of mass from the refrigerator.

The method that has been used is an experimental method. The load of the cooler is 240ml of water inside of the refrigerator. Then the interpretation data process taken on refrigerator for 150 minutes. After taken the interpretation data on machine,then the data must be analyzed theoretical with determine the condition of the refrigerant on every cycle point,the capacity of refrigeration,and COP system

The result of this research giving some conclusion. The lowest of the heat/mass which released by the evaporator is 232 kJ/kg,the highest of the heat/mass which released by the evaporator is 273 kJ/kg,and the average of the heat/mass which released by the evaporator is 256 kJ/kg, the lowest COP actual of chest freezer is 3.08,the highest COP actual of chest freezer is 3.3,and the average of COP actual of chest freezer is 3.17, the lowest COP ideal of chest freezer is 4.1,the highest COP ideal of chest freezer is 4.2,and the average of COP actual of chest freezer is 4.14, The lowest of the heat/mass which released by the evaporator is 232 kJ/kg,the highest of the heat/mass which released by the evaporator is 273 kJ/kg,and the average of the heat/mass which released by the evaporator is 256 kJ/kg, the lowest COP actual of chest freezer is 3.08,the highest COP actual of chest freezer is 3.3,and the average of COP actual of chest freezer is 3.17, the lowest COP ideal of chest freezer is 4.1,the highest COP ideal of chest freezer is 4.2,and the average of COP actual of chest freezer is 4.14. The lowest of the heat/mass which released by the evaporator is 179 kJ/kg,the highest of the heat/mass which released by the evaporator is 179 kJ/kg,and the average of the heat/mass which released by the evaporator is 179 kJ/kg. The lowest efficiency of chest freezer is 75%,the highest efficiency of chest freezer is 80%,and the average efficiency of chest freezer is 77%. The lowest flow speed of mass of chest freezer is 0.0041 kg/s, The highest flow speed of mass of chest freezer is 0.0043 kg/s and The average flow speed of mass of chest freezer is 0.00418 kg/s