

Abstrak

Penelitian ini bertujuan untuk menghitung beban pendinginan dan *coefficient of performance* menggunakan *refrigerant* R-134a di Ruang Produksi 1, 2 dan 3 PT. Mitra Mustika Sejahtera. Hasil penghitungan teoritis digunakan untuk menghitung kebutuhan beban pendinginan dan *coefficient of performance* menggunakan *refrigerant* R-134a di ruang produksi tersebut.

Beban pendinginan dihitung menggunakan perbedaan temperatur ruangan dan temperatur perancangan. Yang dihitung dalam hal ini adalah beban luar (panas dari dinding, lantai, atap, kaca, ventilasi dan infiltrasi) dan beban dalam (panas dari lampu, manusia dan mesin). Total penghitungan beban pendingin Ruang Produksi 1, 2, dan 3 menentukan kapasitas pendingin yang sesuai dengan beban pendinginan yang ada di masing-masing ruangan tersebut.

Hasil penghitungan tiap ruangan secara teoritis adalah Ruang Produksi 1 sebesar 86.956,7076 Btu/hour setara 10 PK, Ruang Produksi 2 sebesar 89.900,3721 Btu/hour setara 10 PK, dan Ruang Produksi 3 sebesar 72.683,4072 Btu/hour setara 8 PK. Kapasitas mesin pendingin yang ditetapkan untuk masing-masing ruangan adalah mesin berkapasitas 2 PK dengan jumlah mesin sesuai kebutuhan beban pendingin tiap ruang produksi. Dengan *refrigerant* R-134a refrigerator tersebut mendapatkan nilai perhitungan *coefficient of performance* secara teoritis gas ideal adalah 5.4.

Kata kunci: *cooling load, coefficient of performance*

Abstract

This research was conducted to calculate the cooling load and coefficient of performance refrigerant using R-134a in the Production Room 1, 2 and 3 of PT. Mitra Mustika Sejahtera. The results of theoretical calculation could be used to calculate the cooling load and coefficient of performance using R-134a refrigerant in the Production Room.

The cooling load was calculated using the variation of room temperature. The Calculated components in this case were the external loads (heat from walls, floors, roofs, glass, and energy and infiltration) and internal the loads (heat from lights, humans and machines).The total cooling load calculation from the Production Room 1, 2, and 3 determined the cooling capacity based on the need of each the room.

The result of each theoretical calculation was that Production Room 1 was 86.956,7076 Btu/hour which was equivalent to 10 PK; Production Room 2 was 89,900,3721 Btu/hour which was equivalent to 10 PK; Production Room 3 was 72.683,4072 Btu/hour which was equivalent to 8 PK. The air-conditioning machine capacity for each room was 2 PK with the number of machines based on the total cooling load of eaach Production Room. By using R-134a refrigerant, the refrigeration engine got the ideal performance coefficient performance value of 5,4.

Keywords: *cooling load, coefficient of performance*