IC-052 HEAT PUMP FRUIT DRYER FOR SMALL-SCALE INDUSTRY

นักวิจัย: Warunee Tia, Somchart Soponronnarit, Woraboon Kaewassadorn
เผยแพร่: The 1st Regional Conference on Energy Technology Towards a Clean Environment, December 1-2, 2000, The Empress Hotel, Chiang Mai, Thailand, pp. 67-71

In this paper, the design, construction and performance evaluation of a closed-loc operation of heat pump dryer for small-scale industry was conducted. The dryer chamber, with designed capacity of 100 kg of fruit per batch, can accommodate a mobile cabinet with 12 tier According to the drying load, a heat pump having 1.3 kW compressor and using R-22 refrigerator was installed with the dryer. To determine the performance of heat pump dryer, pineapple banana, bean sprout and cabbage were dried at maximum controlled temperature of 55°C with the air flow rate of 0.54 m³/s, of which bypass air ratio was fixed at 78%. It was found that the maximum loading capacity was 98 kg. The good performance of dryer was indicated when the drying load was approached to the full capacity. The maximum drying rate, SMER and COP were 1.95 kg water evap./h, 1 kg water evap./kWh and 4.99, respectively. For the specific energy consumption, the minimum value was 3.62 MJ/kg. According to the low operating temperature the color of products was good. The drying unit cost estimation was also carried out.