

ABSTRAK

Kebutuhan air minum semakin meningkat seiring bertambahnya jumlah penduduk di dunia. Sumber air tanah yang sering dikonsumsi masyarakat Indonesia mengalami penurunan kualitas sehingga berbahaya bagi tubuh. Salah satu cara pemurnian air adalah menggunakan distilasi air energi matahari. Alat distilasi jenis bak adalah alat distilasi yang lebih murah dibandingkan jenis kain. Akan tetapi, efisiensi dari alat distilasi jenis bak lebih rendah dibandingkan dengan jenis kain. Penelitian ini bertujuan untuk menganalisis pengaruh penggunaan silinder bertisu putih, pengaruh penggunaan silinder bertisu hitam, dan pengaruh penggunaan reflektor dan sirip pada model silinder bertisu hitam terhadap unjuk kerja alat distilasi. Penelitian menggunakan metode eksperimental dengan membuat alat distilasi air energi matahari jenis bak. Penelitian dilakukan pada lapangan terbuka selama 8 jam. *Absorber* alat distilasi memiliki ukuran 77 cm x 58 cm dengan kaca penutup dipasang 15°. Variabel yang divariasikan pada penelitian ini adalah (1) variasi jumlah massa air 6 kg, 8 kg, dan 11 kg pada model silinder bertisu putih, (2) variasi jumlah massa air 6 kg, 8 kg, dan 11 kg pada model silinder bertisu hitam, dan (3) variasi penggunaan reflektor dan sirip pada model silinder bertisu hitam dengan massa air 6 kg. Berdasarkan penelitian yang dilakukan, hasil terbaik model silinder bertisu putih sebesar 0,9 L/m² per hari dengan efisiensi 17,55% pada variasi massa air 11 kg. Hasil terbaik pada model silinder bertisu hitam sebesar 1,77 L/m² per hari dengan efisiensi 26,96%. Sedangkan penggunaan reflektor dan sirip pada model silinder bertisu hitam menurunkan efisiensi sebesar 17,61% dengan hasil distilasi 1,57 L/m² per hari.

Kata kunci : distilasi air, silinder bertisu, efisiensi, reflektor dan sirip.

ABSTRACT

The need for drinking water is increasing along with the increasing population in the world. Sources of groundwater that are often consumed by Indonesians have decreased in quality, making it dangerous for the body. One way of purifying water is by using the distillation of solar energy water. Basin type distillation is cheaper than fabric distillers. However, the efficiency of the basin type distillation is lower than that of the fabric type. This research aims to analyze the effect of using a white-tissue cylinder, the effect of using a black-tissue cylinder, and the effect of using a reflector and fins on a black-tissue cylinder model on the performance of the distillation device. The research used an experimental method by making a basin-type solar water distillation device. The research was conducted in an open field for 8 hours. The distillation absorber has a size of 77 cm x 58 cm with a cover glass installed at 15°. The variables that were varied in this research were (1) variations in the amount of water mass of 6 kg, 8 kg, and 11 kg in the white tissue cylinder model, (2) variations in the mass of water 6 kg, 8 kg, and 11 kg in the black tissue cylinder model, and (3) variations in the use of reflector and fins in the black tissue cylinder model with a water mass of 6 kg. Based on the research conducted, the best yield for the white-tissue cylinder model is 0.9 L/m² per day with an efficiency of 17.55% at 11 kg water mass variation. The best yield for the black tissue cylinder model is 1.77 L/m² per day with an efficiency of 26.96%. Meanwhile, the use of reflector and fins in the cylinder model with black tissue reduces the efficiency by 17.61% with a distillation yield of 1.57 L/m² per day.

Keywords : water distillation, tissue cylinder, efficiency, reflector and fins.