

Analysis Performance of a Solar Seawater Distilator with a Triangular Prism-Shaped Cover Using a Fin Type Absorbent

Risse Entikaria Rachmanita, S.Pd, M.Si as a Main Counselor

Miftah Khoirul Umam

Renewable Energy Engineering Study Program

Department of Engineering

ABSTRACT

Solar-powered distillation is one of the the seawater distillation methods by utulizing solar heat as its main energy source with the purpose producing fresh water and a by product of the distillation process in the form of salt. This research was conducted to design a distilator with a semi-batch system by combining a fin-type absorber plate and triangular prism cover equipped with a reflector with an absorbent plate surface area of 0.3969 m² with a volume capacity of sea water that can be accomodated in a basin of ±24 liters. This distilator is also designed to use a knockdown system on its components which purpose to provide convenience in the maintenance and repair process which consists of three main parts, namely the cover, the reservoir, and the distilator holder. Distilator testing was carried out with duration of 6 hours and 20 minutes at two different locations. The highest fresh water product produced is 0.245 liters with the quality of distilled water that meets the standards for used, but filtering process still needs tobe done to reduce dissolved solids. The highest efficiency of the distilator test result was 8.032% on the 3rd day of testing located in the parking lot north of the Engineering Building with an average solar radiation intensity of 805.076 W/m². Distillator efficiency is greatly influenced by the intensity of solar radiation received by the distillation device. The higher the intensity of solar radiation received by the distillation device, the higher the rate of evaporation of seawater in the basin so that fresh water production is also high and has an impact on the efficiency of the distillation device.

Keywords: *Seawater, distilator, solar radiation intensity, knockdown system, semi-batch.*