

ABSTRACT

Water plays a very important role in daily life. Besides humans, other living beings also depend on water to survive. The increasing population and the lack of innovation in addressing the clean water crisis have resulted in many regions around the world, including in Indonesia, still experiencing drought or a shortage of clean water. Therefore, a new and efficient innovation is needed to produce clean water. This research aims to design and build a small-scale seawater distillation device based on a dispenser heating system, as well as to determine the device's performance in producing fresh water. The innovation used is dispenser-based seawater distillation, which utilizes the dispenser's heating system by adjusting the temperature control up to a maximum limit of 105°C to heat the seawater until it produces vapor. The vapor is then condensed through a copper pipe condenser that passes through a water storage tube, allowing the vapor to turn into fresh water. The test results show that the seawater's TDS (Total Dissolved Solids) value decreased consistently as the distillation time increased, from 10.9 ppt to 0.8 ppt at the 60th minute, corresponding to a 92.7% reduction, with the relationship between time and TDS difference following the equation $y = 0.0878x$ ($R^2 = 0.738$). Thus, this simple distillation device made from household appliances has proven capable of effectively producing fresh water from seawater.

Keywords: *Clean Water Crisis, Seawater Distillation, TDS (Total Dissolved Solids), Dispenser Heating System, Design and Build*