

## Abstract Details

**Title:** No load testing of single slope solar distillation-cum-drying unit: an experimental study

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**Abstract:** A new design of solar distillation-cum drying system has been developed to solve the fresh water shortage and drying of various food and agricultural commodities in an eco-friendly way. The developed unit has been tested under no load conditions at Guru Jambheshwar University of Science and Technology Hisar (India). A drying unit is attached to the bottom of the distillation system that receives energy transmitted through the bottom of the basin of distillation unit along with the concentrated solar radiation from parabolic reflector. Rise in temperature plays significant role in the removal of water in the form of vapors from the impure water column stored in the basin of distillation unit and from the commodity placed in the drying unit. In this manuscript, temperatures attained at various locations of distillation-cum-drying unit and difference in temperatures between the condensing cover and basin surface have been presented. An average temperature of 81.2 oC and 60.78 oC has been observed in the distillation and drying units respectively. Productivity of solar distillation system depends on the temperature difference between condensing cover and basin of the distillation unit. The temperature difference of 2.1oC to 23.1oC between condensing cover and basin of the distillation unit has been registered. This novel design of solar distillation-cum-drying unit would be highly beneficial in the energy saving by Indian rural population.

**Keywords:** Energy; pure water; solar distillation; solar drying; distillation-cum-drying unit