MODELING AND PERFORMANCE EVALUATION OF AN INDIRECT
SOLAR DESALINATION SYSTEM

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ABSTRACT

The present study is concerned about a mathematical model developed, to study the performance of a truncated cone solar heater (TCSH), connected by a multi effect still (MES). The proposed TCSH included: a glass cover, truncated cone reflector, and a blackened vessel. The truncated cone shape is used as a reflector without a continuous tracking, where one half is always facing to the sun for the whole day hours. The effective area of the glass cover through which, the transmitted radiation is reflected to the vessel, derived as a function of the solar incidence angle and the geometry of the conical surface. The ratio of the vessel radius of the glass cover one is studied as a design parameter. The final results showed that an acceptable productivity from the MES with a maximum value of 0.97 kg/hr-m^2 at noon times can be obtained. Also, the productivity of MES decreases by about 38 % as the ratio of vessel radius to the cover one increases by three times.

KEYWORDS: Truncated Cone Solar Heater, Multi Effect Still, Effective Area, Productivity