

Effect of cover materials on heat and mass transfer coefficients in a plastic solar still

M.K. Phadatare^{a*}, S.K. Verma^b

^aMechanical Engineering Department, Dr Babasaheb Ambedkar Technological University, Lonere (MS), India
Tel. +91 (2112) 255113; Cellular +91 9422341210; Fax +91 (2112) 254424; email: mphadatare2005@yahoo.co.in

^bMechanical Engineering Department, National Institute of Technology, Patana, India
email: sureshkant_verma@yahoo.co.in

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ABSTRACT

The intention of this work was to study the effect of cover materials on heat and mass transfer coefficient and hence productivity of the still. Two plastic stills having similar geometrical features were constructed to maintain the comparison under the same weather conditions. The condensing surface of one still was an acrylic (plastic) cover (3 mm thick) while of the other still it was a glass cover (3 mm thick), both fixed in an aluminum frame. It was found that for water depth of 10 cm the plastic solar still with the glass cover produced 30–35% more output than the plastic solar still with Plexiglas cover. The evaporative heat transfer coefficient for the glass cover still was 57% more than that for the still with the plastic cover which resulted in a higher output. Plastic can be used as the structural material for solar stills but increased costs do not always increase the distillate output.

Keywords: Plastic solar still; Cover materials; Heat transfer coefficients; Solar energy; Productivity

* Corresponding author.