

Build a Solar Still

By Dan Dorsey

Following is a design for purifying rain water directly (with no filters) and for recycling and purifying waste water. It requires no maintenance, is completely run by passive solar energy, and can be used to obtain drinking water from salt water.

The process is simple. Solar energy heats water in a shallow black pan; the water evaporates, collecting on a clean, sloped pane of glass covering the pan, then runs down the slope to be collected in a trough. According to Vale¹, this distillation process also removes the heavy metal contaminants, such as lead, because only water is evaporated and the metals are not.

My design uses cheap, readily available materials. I constructed a wood frame, lined with styrofoam for insulation and spray-painted black. In diagram 1, the sides of the wood frame are higher so the glass panes are tilted at about a 30° angle. A plastic pan collects distilled water at the middle of the tray. (diagram 1)

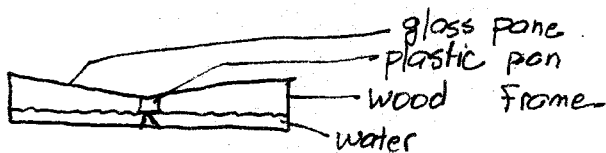


diagram 1

In this second diagram of an up-side-down frame, a slightly different design is used. The panes of glass meet at an angle, are bonded with silicone and slope downward toward the edges. Two trays along the sides collect water. The end is about to be glued on the

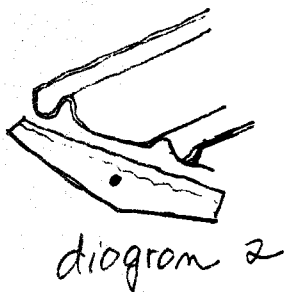
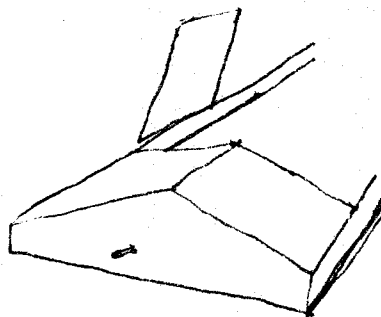


diagram 2

frame with an inlet plug for water in the middle.



This third diagram shows the upright frame with glass panes being fitted together with silicone to form a sealed unit. The entire unit is sealed to prevent outside contamination, except for the water entrance and pure

water exit.

This last diagram is a side view of diagrams 2 and 3.

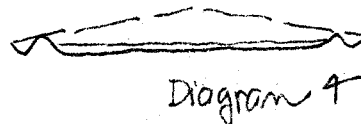


Diagram 4

The size of the tray will need to vary with the climate, but extrapolating from my small prototype model, in an optimum solar climate like Tucson, a 6' x 3' glass surface will give about a gallon of drinking water a day in the summer. Using readily available materials (the most expensive items are the glass panes), and with a gallon of distilled drinking water going for 50¢, I estimate the still could easily pay for itself in two or three months. Once it is built, the rest is free.

It should be noted that drinking only distilled water is not good for the body. Vegetable or fruit juice will replace needed minerals.

¹ *The Autonomous House* (Brenda and Robert Vale, Universe Books, New York, 1975), from which this design was inspired.

This still has been successfully used in the Ecol house at McGill University since 1972.