

## **BUILD THE HYBRID SOLAR DRYER**

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### **IMPORTANT INSTRUCTIONS**

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#### **CONSTRUCTION:**

##### **DO:**

Build in modules. Six modules (3 collectors, lower cabinet, upper cabinet, roof).  
Use 26 gauge galvanized sheet metal, with a metal frame for strength.  
Each unit needs to be strong and rigid.  
Fasten handles to each module, for easy handling.  
Avoid sharp edges on the metal—severe injuries are possible at the metal edges.  
Collector top angle is 18 degrees; middle layer (the corrugated layer) 12 degrees approximately.  
Add a chimney or rain-proof vent, to supplement the solar fan.  
Need doors at the back of both the lower cabinet and upper cabinet. Doors need to close snug.  
Allow the doors to be locked. (Remember doors on the back, that is, North side of cabinet.)  
Mosquito mesh at intake of solar collectors, to keep out insects.  
Use silicon seal or tape along edges to make the unit airtight and watertight.

Estimate your costs in advance. TTFF can subsidize a LIMITED NUMBER of these.

Create and price out a parts list:

- 11 sheets 4'x8' galvanized sheet metal
- Angle bars to fasten sheet metal together
- 3 sheets of clear plastic
- 3 sheets of corrugated galvanized sheet metal, painted black
- Hardware and accessories
- Solar fan and certain items may need to be imported

Very detailed engineering drawings are located at

[https://www.dropbox.com/sh/t6pavktbqyn0mhl/AAA1JAKhFIT9yWyZ\\_K8OZY2Ka?dl=0](https://www.dropbox.com/sh/t6pavktbqyn0mhl/AAA1JAKhFIT9yWyZ_K8OZY2Ka?dl=0)

*Note: the height of the lower cabinet module is revised to 40 inches.*

##### **DON'T:**

Don't build all in one piece.  
Don't change the design without prior discussion. Our experience has shown that every design change has reduced the performance of the dryer.  
Don't insulate the cabinet.

Don't disconnect the solar fan. You need air flow to move moisture out of the cabinet.  
Don't build your own shelves. Perforated aluminum trays are cheap. Only build support for trays (suggestion: chicken wire or chain link wire).  
Don't use wood to construct. Although it's lower cost initially, wood deteriorates with time, harbors bacteria and is generally not food safe.

#### OPTIONAL:

5 shelves in upper cabinet, instead of four.  
2 doors at the back, instead of one larger door.  
Doors should be lockable to avoid petty theft.  
OK to insulate the floor of each solar collector.  
A clean-burning kerosene or propane stove/heater can be located in the lower cabinet, for use on cloudy or rainy days.  
Paint upper cabinet black, to absorb more solar heat.

#### INSTALLATION:

Chosen location must be sunny all day. Avoid shade.  
Assemble the modules starting with the lower cabinet, then upper, then roof. Align East-West.  
The modules must be fastened together securely.  
The middle collector should face South (in the Northern Hemisphere).  
The roof unit is square; install so that the solar fan faces South (if you are in the Caribbean, or in the Northern Hemisphere)  
Level the unit; prop up where necessary if the ground is not level.  
Use tape or silicon sealer to make the cabinet airtight and watertight.  
Take the roof and upper cabinet off, if a storm is approaching.

#### IN USE:

A full load is approximately 80 to 100 pounds of fresh fruit.  
Shred or slice the fruit, spread out in flat perforated pans.  
Agitate the fruit after one or two hours.  
In full sun the fruit should dry in 4 to 6 hours.

PHOTOS OF ACCESSORIES:



Solar fan 365 cfm  
Approx. US\$65.00



Turbine vent (adjusts to vertical) 12"  
Approx. US\$65.00



Perforated bun pan, 18" x 13"  
Approx. \$US4.00